

FEDERAL COMMUNICATIONS COMMISSION

PART 13

RULES GOVERNING COMMERCIAL RADIO OPERATORS

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TABLE OF CONTENTS

	GENERAL	13.43	Receiving speed requirements.
Sec.		13.44	Receiving test procedure.
13.1	Licensed operators required.	13.45	Computing word or code groups.
13.2	Classes of licenses.		
13.3	Dual holding of licenses.		SCOPE OF AUTHORITY
13.4	Term of licenses.	13.61	Operating authority.
13.5	Eligibility for new license.	13.62	Special privileges.
13.6	Operator license, posting of.	13.63	Operator's responsibility.
13.7	Operators, place of duty.	13.64	Obedience to lawful orders.
		13.65	Damage to apparatus.
	APPLICATIONS	13.66	Unnecessary, unidentified, or superfluous communications.
13.11	Procedure.	13.67	Obscenity, indecency, profanity.
13.12	Special provisions, radiotelegraph first class.	13.68	False signals.
		13.69	Interference.
	EXAMINATIONS	13.70	Fraudulent licenses.
13.21	Examination elements.		
13.22	Examination requirements.		MISCELLANEOUS
13.23	Form of writing.	13.71	Issue of duplicate license.
13.24	Passing mark.	13.72	Exhibiting signed copy of application.
13.25	New class additional requirements.	13.73	Verification card.
13.26	Canceling and issuing new licenses.	13.74	Posting license or verified statement.
13.27	Eligibility for reexamination.		
13.28	Renewal examinations and exceptions.		SERVICE
	CODE TESTS	13.91	Endorsement of service record.
13.41	Transmitting speed requirements.	13.92	Aviation service endorsement.
13.42	Transmitting test procedure.	13.93	Service acceptability.
		13.94	Statement in lieu of service endorsement.



## GENERAL

Sec. 13.1 *Licensed operators required.*<sup>1,2,3,4</sup> Unless otherwise specified by the Commission, the actual operation of any radio station for which a station license is required shall be carried on only by a licensed radio operator of the required class.<sup>5</sup>

Sec. 13.2 *Classes of licenses.*<sup>6,7</sup> The classes of commercial operator licenses issued by the Commission are:

- (a) Commercial radiotelephone group:
  - (1) Radiotelephone second-class operator license.
  - (2) Radiotelephone first-class operator license.
- (b) Commercial radiotelegraph group:
  - (1) Radiotelegraph second-class operator license.

<sup>1</sup>Whenever the term "license" is used generally to denote an authorization from the Commission, it includes "license," "permit" and "authorization".

<sup>2</sup>By Order No. 126, dated August 21, 1945 certain railroad employees were authorized to operate radio transmitting apparatus for use in connection with railroad operations without an operator's license upon compliance by the affected employee and the employing railroad with the condition of the Commission's order.

<sup>3</sup>By Commission Order No. 133, dated May 10, 1946, effective June 1, 1946, the Commission waived the requirements for the operation of mobile or portable radio transmitting apparatus by a licensed operator in the Emergency, Miscellaneous, Railroad and Experimental Services (Parts 5, 10, 11 and 16 of the Commission's Rules) subject to certain conditions stated in the Order. Those provisions of Part 13 of the Commission's Rules that are inconsistent with the provisions of Order No. 133 are suspended.

<sup>4</sup>By Order, dated and effective December 15, 1947, and by subsequent orders effective March 15, 1948, June 15, 1948, November 15, 1948 and April 15, 1949, the Commission temporarily waived to a limited extent the requirement that ship radar stations licensed in the Ship Service be operated by licensed radio operators. See footnote 71, Sec. 8.195 of the Commission's Rules Governing Ship Service. See also Sec. 13.61.

<sup>5</sup>See Sec. 13.61.

<sup>6</sup>By Order No. 136, the Commission cancelled Order No. 97 effective June 30, 1946, *Provided, however,* That all Temporary Limited Radiotelegraph Second Class Operator Licenses outstanding at time of cancellation shall remain valid according to the respective terms thereof.

<sup>7</sup>By Order No. 136, the Commission cancelled Order No. 123 effective June 30, 1946: *Provided, however,* That all Temporary Emergency Radiotelegraph Second Class Operator Licenses outstanding at time of cancellation shall remain valid according to the respective terms thereof.

- (2) Radiotelegraph first-class operator license.
- (c) Restricted commercial group:
  - (1) Restricted radiotelephone operator permit.
  - (2) Restricted radiotelegraph operator permit.

Sec. 13.3 *Dual holding of licenses.* A person may not hold more than one radiotelegraph operator license (or restricted radiotelegraph permit) and one radiotelephone operator license (or restricted radiotelephone operator permit) at the same time.

Sec. 13.4 *Term of licenses.* Commercial operator licenses are normally issued for a term of 5 years from the date of issuance.

Sec. 13.5 *Eligibility for new license.* (a) Under the provisions of section 303 (1) of the Communications Act of 1934, as amended, United States citizens who are found qualified by the Commission are the only persons to whom radio operator licenses may be issued.

(b) Notwithstanding any other provisions of the Commission's rules, no person otherwise eligible shall be deemed to be eligible to be examined for or to receive a commercial radio operator license of any class, (1) whose commercial radio operator license is under suspension or is involved in a suspension proceeding, or (2) who is involved in any pending litigation based on an alleged violation of the Communications Act of 1934, as amended.

Sec. 13.6 *Operator license, posting of.* The original license of each station operator shall be posted at the place where he is on duty, except as otherwise provided in this part or in the rules governing the class of station concerned.

Sec. 13.7 *Operators, place of duty.* (a) Except as may be provided in the rules governing a particular class of station, one or more licensed radio operators of the grade specified by this part shall be on duty at the place where the transmitting apparatus of each licensed radio station is located and in actual charge thereof whenever it is being operated: *Provided, however,* That, (1) subject to the provisions of paragraph (b) of this section, in the case of a station licensed for service other than broadcast, where remote control of the transmitting apparatus has been authorized to be used, the Commission may modify the foregoing requirements upon proper application and showing being made so that such operator or operators may be on duty at the control point in lieu of the place where the transmitting apparatus is located; (2) in the case of two or more stations, except amateur and broadcast, licensed in the name of the same person to use frequencies above 30 megacycles only, a

licensed radio operator holding a valid radiotelegraph or radiotelephone first- or second-class license who has the station within his effective control may be on duty at any point within the communication range of such stations in lieu of the transmitter location or control point during the actual operation of the transmitting apparatus and shall supervise the emissions of all such stations so as to insure the proper operation in accordance with the station license.

(b) An operator may be on duty at a remote control point in lieu of the location of the transmitting apparatus in accordance with the provisions of paragraph (a) (1) of this section: *Provided*, That all of the following conditions are met: (1) The transmitter shall be so installed and protected that it is not accessible to other than duly authorized persons; (2) the emissions of the transmitter shall be continuously monitored at the control point by a licensed operator of the grade specified for the class of station involved; (3) provision shall be made so that the transmitter can quickly and without delay be placed in an inoperative condition by the operator at the control point in the event there is a deviation from the terms of the station license; (4) the radiation of the transmitter shall be suspended immediately when there is a deviation from the terms of the station license.

#### APPLICATIONS

Sec. 13.11 *Procedure*-(a) *General*. The application in the prescribed form and including all required subsidiary forms and documents, properly completed and signed shall be submitted in person or by mail to the office at which the applicant desires his application to be considered and acted upon, which office will make the final arrangements for conducting any required examination. If the application is for renewal of license, it must be submitted during the last year of the license term, and if all prescribed service requirements are fulfilled,<sup>8</sup> the renewal license may be issued by mail. A renewal application shall also be accompanied by the license to be renewed.

(b) *Restricted radiotelephone operator permit*. No oral or written examination is required for this permit. If the application is properly completed and signed, and if the applicant is found to be qualified, the permit may be issued forthwith by personal delivery to the applicant or by mail.

Sec. 13.12 *Special provisions, radiotelegraph first class*. An applicant for the radiotelegraph first-class operator license must be at least 21 years of age at the time the license is issued and shall have had an aggregate of 1 year of satisfactory service as a radiotelegraph operator manipulating the key of a manually operated radiotelegraph station on board a ship or in a manually operated coastal telegraph station.

<sup>8</sup>See Sec. 13.28

#### EXAMINATIONS

Sec. 13.21 *Examination elements*. Written examinations will comprise questions from one or more of the following examination elements:

1. *Basic law*. Provisions of law and regulation with which every operator should be familiar.

2. *Basic theory and practice*. Technical matters appropriate for every class of license except restricted radiotelephone operator permit.

3. *Radiotelephone*. Additional matters, both legal and technical, including radiotelephone theory and practice.

4. *Advanced radiotelephone*. Theory and practice applicable to broadcast station operation.

5. *Radiotelegraph*. Additional matters, both legal and technical, including radiotelegraph theory and practice.

6. *Advanced radiotelegraph*. Radiotelegraph theory and practice of wider scope, particularly with respect to ship radio matters (direction finders, ship radiotelephone stations, spark transmitters, etc.).

<sup>9</sup>7. *Aircraft radiotelegraph*. Basic theory and practice in the operation of radio communication and radio navigational systems in general use on aircraft.

Sec. 13.22 *Examination requirements*. Applicants for original licenses will be required to pass examinations as follows:

(a) Radiotelephone second-class operator license:

- (1) Ability to transmit and receive spoken messages in English.
- (2) Written examination elements: 1, 2, and 3.

(b) Radiotelephone first-class operator license:

- (1) Ability to transmit and receive spoken messages in English.
- (2) Written examination elements: 1, 2, 3, and 4.

(c) Radiotelegraph second-class operator license:

- (1) Ability to transmit and receive spoken messages in English.

<sup>9</sup>Effective January 3, 1950.

- (2) Transmitting and receiving code test of sixteen (16) code groups per minute.
- (3) Written examination elements: 1, 2, 5, and 6.

(d) Radiotelegraph first-class operator license:

- (1) Ability to transmit and receive spoken messages in English.
- (2) Transmitting and receiving code test of twenty-five (25) words per minute plain language and twenty (20) code groups per minute.
- (3) Written examination elements: 1, 2, 5, and 6.

(e) Restricted radiotelephone operator permit: No oral or written examination is required for this permit. In lieu thereof, applicants will be required to certify in writing to a declaration which states that the applicant has need for the requested permit; can receive and transmit spoken messages in English; can keep at least a rough written log in English or in some other language in general use that can be readily translated into English; is familiar with the provisions of treaties, laws and rules and regulations governing the authority granted under the requested permit; and understands that it is his responsibility to keep currently familiar with all such provisions.

(f) Restricted radiotelegraph operator permit:

- (1) Transmitting and receiving code test of sixteen (16) code groups per minute.
- (2) Written examination elements: 1, 2, and 5.

Sec. 13.23 *Form of writing.* Written examination shall be in English and shall be written by the applicant in longhand in ink, except that diagrams may be in pencil.

Sec. 13.24 *Passing mark.* A passing mark of 75 percent of a possible 100 percent will be required on each element of a written examination.

Sec. 13.25 *New class, additional requirements.* The holder of a license, who applies for another class of license, will be required to pass only the added examination elements for the new class of license. However, no person holding a new, duplicate, or replacement restricted radiotelephone operator permit issued upon the basis of a declaration, or a renewed restricted radiotelephone operator permit which renews a permit

issued upon the basis of a declaration, shall, by reason of the declaration or the issuance of the permit based thereon, be relieved of qualifying by examination on any phase of the subject matter of the declaration when applying for any other operator license or permit for which examination on any subject matter is required.

Sec. 13.26 *Canceling and issuing new licenses.* If the holder of a license qualifies for a higher class in the same group, the license held will be canceled upon the issuance of the new license. Similarly, if the holder of a restricted operator permit qualifies for a first or second-class operator license of the corresponding type, the permit held will be canceled upon issuance of the new license.

Sec. 13.27 *Eligibility for reexamination.* An applicant who fails an examination element will be ineligible for 2 months<sup>10</sup> to take an examination for any class of license requiring that element. Examination elements will be graded in the order listed,<sup>11</sup> and an applicant may, without further application, be issued the class of license for which he qualifies.

Sec. 13.28 *Renewal examinations and exceptions.* A restricted radiotelephone operator permit may be renewed without examination or showing of service and upon the same basis as an original permit of this class is issued. A license of any other class may be renewed without examination provided the service record on the license<sup>12</sup> shows at least 3 years' satisfactory service in the aggregate during the license term and while actually employed as a radio operator under that license, or shows at least 2 years' service in the aggregate, under the same conditions, of which 1 year must have been continuous and immediately prior to the date of application for renewal.

If the above requirements have not been fulfilled, but the service record shows at least 3 months' satisfactory service in the aggregate, while actually employed as a radio operator under the license during the last 3 years of the license term, a license may be renewed upon the successful completion of a renewal examination which may be taken at any time during the last year of the license term.

<sup>10</sup>A month after date is the same day of the following month, or if there is no such day, the last day of such month. This principle applies for other periods. For example, in the case of the 2-month period to which this note refers, an applicant examined December 1 may be reexamined February 1, and an applicant examined December 29, 30, or 31 may be reexamined the last day of February, while one examined February 28 may be reexamined April 28.

<sup>11</sup>See Sec. 13.21.

<sup>12</sup>See Secs. 13.91 to 13.94, inclusive.

Renewal examinations will consist of the same elements as for original licenses. However, the written examination will be directed toward a determination of the applicant's qualifications to continue to hold the license for which he has previously qualified. If the renewal examination is not successfully completed before expiration of the license sought to be renewed, or if the service is not acceptable, the applicant will be examined as for the original license.

#### CODE TESTS

Sec. 13.41 *Transmitting speed requirements.* An applicant is required to transmit correctly in the International Morse code for 1 minute at the rate of speed prescribed in this part for the class of license desired.

Sec. 13.42 *Transmitting test procedure.* Transmitting tests shall be performed by the use of the conventional Morse key except that a semi-automatic key, if furnished by the applicant, may be used in transmitting code tests of 25 words per minute.

Sec. 13.43 *Receiving speed requirements.* An applicant is required to receive the International Morse code by ear, and legibly transcribe, consecutive words or code groups for a period of 1 minute without error at the rate of speed specified in the rules for the class of license for which the application is made.

Sec. 13.44 *Receiving test procedure.* Receiving code tests shall be written in longhand either in ink or pencil except that in the case of the 25 words per minute code test a typewriter may be used when furnished by the applicant.

Sec. 13.45 *Computing words or code groups.* Each five characters shall be counted as one word or code group. Punctuation marks or figures count as two characters.

#### SCOPE OF AUTHORITY

Sec. 13.61 *Operating authority.* The various classes of commercial radio operator licenses issued by the Commission authorize the holders thereof to operate radio stations, except amateur, as follows:<sup>13</sup>

(a) *Radiotelegraph first-class operator license.* Any station except--

- (1) Stations transmitting television, or

<sup>13</sup>For temporary authority granted holders of valid first and second class operator licenses, either radiotelephone or radiotelegraph, to perform adjustments, servicing and maintenance of ship radar stations licensed in the Ship Service, see footnote 71, Sec. 8.195, of the Commission's rules governing ship service.

- (2) Any of the various classes of broadcast stations other than remote pickup and ST broadcast stations, or

- (3) On a cargo vessel (other than a vessel operated exclusively on the Great Lakes) required by treaty or statute to be equipped with a radiotelegraph installation, the holder of this class of license may not act as chief or sole operator until he has had at least 6 months' satisfactory service in the aggregate as a qualified radiotelegraph operator in a station on board a ship or ships of the United States.

- <sup>14</sup>(4) On an aircraft employing radio telegraphy, the holder of this class of license may not operate the radiotelegraph station during the course of normal rendition of service unless he has satisfactorily completed a supplementary examination qualifying him for that duty, or unless he has served satisfactorily as chief or sole radio operator on an aircraft employing radiotelegraph prior to January 3, 1950. The supplementary examination shall consist of:

(i) Written examination element:  
7.

(b) *Radiotelegraph second-class operator license.* Any station except--

- (1) Stations transmitting television, or

- (2) Any of the various classes of broadcast stations other than remote pickup and ST broadcast stations, or

- (3) On a passenger<sup>15</sup> vessel required by treaty or statute to maintain a continuous radio watch by operators or on a vessel having continuous hours of service for public correspondence, the holder of this class of license may not act as chief operator, or

- (4) On a vessel (other than a vessel operated exclusively on the Great

<sup>14</sup>Effective January 3, 1950.

<sup>15</sup>A ship shall be considered a passenger ship if it carries or is licensed or certificated to carry more than 12 passengers. A cargo ship means any ship not a passenger ship.

Lakes) required by treaty or statute to be equipped with a radiotelegraph installation, the holder of this class of license may not act as chief or sole operator until he has had at least 6 months' satisfactory service in the aggregate as a qualified radiotelegraph operator in a station on board a ship or ships of the United States.

- <sup>16</sup>(5) On an aircraft employing radiotelegraph, the holder of this class of license may not operate the radiotelegraph station during the course of normal rendition of service unless he is at least eighteen (18) years of age and has satisfactorily completed a supplementary examination qualifying him for that duty, or unless he has served satisfactorily as chief or sole radio operator on an aircraft employing radiotelegraphy prior to January 3, 1950. The supplementary examination shall consist of:

(i) Transmitting and receiving code test at twenty-five (25) words per minute plain language and twenty (20) code groups per minute.

(ii) Written examination element: 7.

(c) *Restricted radiotelegraph operator permit.* Any station except--

- (1) Stations transmitting television, or
- (2) Any of the various classes of broadcast stations other than remote pickup and ST broadcast stations, or
- (3) Ship stations licensed to use telephony for communication with coastal telephone stations, or
- (4) Radiotelegraph stations on board a vessel required by treaty or statute to be equipped with a radio installation, or
- (5) Ship telegraph, coastal telegraph or marine-relay stations open to public correspondence;

- <sup>17</sup>(6) Aircraft radio stations while employing radiotelegraphy. *Provided*, That in the case of equip-

ment designed for and using telephone or facsimile transmissions: (1) Such operator is prohibited from making adjustments that may result in improper transmitter operation, and (2) the equipment is so designed that none of the operations necessary to be performed during the course of normal rendition of service may cause off-frequency operation or result in any unauthorized radiation, and (3) any needed adjustments of the transmitter which may affect proper operation of the station are regularly made by or in the presence of an operator holding a first- or second-class license, either radiotelephone or radiotelegraph, who shall be responsible for the proper operation of the equipment.

(d) *Radiotelephone first-class operator license.* Any station except--

- (1) Stations transmitting telegraphy by any type of the Morse Code, or
- (2) Ship stations licensed to use telephony and power in excess of 100 watts for communication with coastal telephone stations.

(e) *Radiotelephone second-class operator license.* Any station except--

- (1) Stations transmitting telegraphy by any type of the Morse Code, or
- (2) Standard broadcast stations, or
- (3) International broadcast stations, or
- (4) FM broadcast stations, or
- (5) Non-commercial educational FM broadcast stations with transmitter power rating in excess of 1 kilowatt, or
- (6) Television broadcast stations licensed for commercial operation, or
- (7) Ship stations licensed to use telephony and power in excess of 100 watts for communication with coastal telephone stations.

(f) *Restricted radiotelephone operator permit.* Any station except--

- (1) Stations transmitting television, or

<sup>16</sup>Effective January 3, 1950.

<sup>17</sup>Effective January 3, 1950.



- (2) Stations transmitting telegraphy by any type of the Morse Code, or
- (3) Any of the various classes of broadcast stations other than remote pickup and ST broadcast stations, or
- (4) Coastal telephone stations or coastal harbor stations other than in the Territory of Alaska, or
- (5) Ship stations licensed to use telephony for communication with coastal telephone station; *Provided*, That, (1) Such operator is prohibited from making any adjustments that may result in improper transmitter operation, and (2) the equipment is so designed that none of the operations necessary to be performed during the course of normal rendition of service may cause off-frequency operation or result in any unauthorized radiation, and (3) any needed adjustments of the transmitter that may affect the proper operation of the station are regularly made by or in the presence of an operator holding a first- or second-class license, either radiotelephone or radiotelegraph, who shall be responsible for the proper operation of the equipment.

Sec. 13.62 *Special privileges*. In addition to the operating authority granted under Sec. 13.61, the following special privileges are granted the holders of commercial radio operator licenses:

(a) The holder of any class of commercial radio operator license may operate any station in the experimental service while using frequencies solely above 300 megacycles.

(b) The holder of any class of radiotelephone operator license, whose license authorizes him to operate a station while transmitting telephony, may operate the same station when transmitting on the same frequencies, any type of telegraphy under the following conditions:

- (1) When transmitting telegraphy by automatic means for identification, for testing, or for actuating an automatic selective signaling device, or
- (2) When properly serving as a relay station and for that purpose retransmitting by automatic means, solely on frequencies above 50 megacycles, the signals of a radiotelegraph station, or

- (3) When transmitting telegraphy as an incidental part of a program intended to be received by the general public, either directly or through the intermediary of a relay station or stations.

Sec. 13.63 *Operator's responsibility*. The licensed operator responsible for the maintenance of a transmitter may permit other persons to adjust a transmitter in his presence for the purpose of carrying out tests or making adjustments requiring specialized knowledge or skill, provided that he shall not be relieved thereby from responsibility for the proper operation of the equipment.

Sec. 13.64 *Obedience to lawful orders*. All licensed radio operators shall obey and carry out the lawful orders of the master or person lawfully in charge of the ship or aircraft on which they are employed.

Sec. 13.65 *Damage to apparatus*. No licensed radio operator shall willfully damage, or cause or permit to be damaged, any radio apparatus or installation in any licensed radio station.

Sec. 13.66 *Unnecessary, unidentified, or superfluous communications*. No licensed radio operator shall transmit unnecessary, unidentified, or superfluous radio communications or signals.

Sec. 13.67 *Obscenity, indecency, profanity*. No licensed radio operator or other person shall transmit communications containing obscene, indecent, or profane words, language, or meaning.

Sec. 13.68 *False signals*. No licensed radio operator shall transmit false deceptive signals or communications by radio, or any call letter or signal which has not been assigned by proper authority to the radio station he is operating.

Sec. 13.69 *Interference*. No licensed radio operator shall willfully or maliciously interfere with or cause interference to any radio communication or signal.

Sec. 13.70 *Fraudulent licenses*. No licensed radio operator or other person shall obtain or attempt to obtain, or assist another to obtain an operator's license by fraudulent means.

#### MISCELLANEOUS

Sec. 13.71 *Issue of duplicate or replacement licenses*. (a) An operator whose license, permit or authorization has been lost, mutilated or destroyed shall immediately notify the Commission. A properly executed application for duplicate should be submitted to the office of issue, embodying a statement of the circumstances



involved in the loss, mutilation or destruction of the license or permit for which a duplicate is desired. If the license or permit has been lost, the applicant must state that reasonable search has been made for it, and further, that in the event it be found either the original or the duplicate will be returned for cancellation. The applicant should also submit documentary evidence of the service that has been obtained under the original license or permit, or a statement under oath or affirmation embodying that information.

(b) The holder of any license, permit or authorization whose name is legally changed may make application for replacement document to indicate the new legal name, by submitting a properly executed application to the office of issue accompanied by the license permit or authorization affected and by documentary evidence of the legality of the name change.

**Sec. 13.72 Exhibiting signed copy of application.** When a duplicate or replacement operator license or permit has been requested, or request has been made for renewal upon service or for an endorsement or a verification card, the operator shall exhibit in lieu of the original document a signed copy of the application which has been submitted by him.

**Sec. 13.73 Verification card.** The holder of an operator license or permit of the diploma form (as distinguished from such document of the card form) may by filing a properly executed application accompanied by his license or permit, obtain a verification card.<sup>18</sup> This card may be carried on the person of the operator in lieu of the original license or permit when operating any station at which posting of an operator license is not required: *Provided*, That the license is readily accessible within a reasonable time for inspection upon demand by an authorized Government representative.

**Sec. 13.74 Posting requirements for operator.** (a) Performing duties other than, or in addition to, service or maintenance, at two or more stations. The holder of any class of radio operator license or permit of the diploma form (as distinguished from the card form) who performs any radio operating duties, as contrasted with but not necessarily exclusive of service or maintenance duties, at two or more stations at which posting of his license or permit is required shall post at one such station his operator license or permit and shall post at all other such stations a duly issued verified statement.<sup>19</sup>

(b) Performing service or maintenance duties at one or more stations. The holder of a

radiotelephone or radiotelegraph first- or second-class radio operator license who performs, or supervises, and is responsible for service or maintenance work on any transmitter of any station for which a station license is required, shall post his license at the transmitter involved whenever the transmitter is in actual operation while service or maintenance work is being performed: *Provided*, That in lieu of posting his license, he may have on his person either his license or a verification card.<sup>18</sup> *And provided further*, That if he performs operating duties in addition to service or maintenance duties he shall, in lieu of complying with the foregoing provisions of this paragraph, comply with the posting requirements applicable to persons performing such operating duties, as set forth in paragraph (a) of this section, and in the rules and regulations applicable to each service.

**Sec. 13.75 Record of service and maintenance duties performed.** In every case where a station log or service and maintenance records are required to be kept and where service or maintenance duties are performed which may affect the proper operation of a station, the responsible operator shall sign and date an entry in the log of the station concerned, or in the station maintenance records if no log is required, giving:

(a) Pertinent details of all service and maintenance work performed by him or under his supervision;

(b) His name and address; and

(c) The class, serial number and expiration date of his license; *Provided*, That the responsible operator shall not be subject to requirements (b) and (c) of this section in relation to a station, or stations of one licensee at a single location, at which he is regularly employed as an operator on a full time basis and at which his license is properly posted.

## SERVICE

**Sec. 13.91 Endorsement of service record.** A station licensee, or his duly authorized agent, or the master of a vessel acting as the agent of a licensee, shall endorse the service record appearing on said operator license, showing the call letters and types of emission of the station operated, the nature and period of employment, and quality of performance of duty.

**Sec. 13.92 Aviation service endorsement.** If the operator has operated more than three stations in the aviation service, the service may be shown by giving the name of the aviation chain or company in lieu of listing the call letters of the several stations.

**Sec. 13.93 Service acceptability.** Credit will be allowed only for satisfactory service

<sup>18</sup> Form 758-F.

<sup>19</sup> Form 759.

obtained under conditions that required the employment of licensed operators, or when obtained at United States Government stations.

Sec. 13.94 *Statement in lieu of service endorsement.* The holder of a radiotelegraph license or a restricted radiotelegraph operator permit desiring an endorsement to be placed thereon attesting to an aggregate of at least 6 months' satisfactory service as a qualified operator on a vessel of the United States, may, in the event documentary evidence cannot be produced, submit to any office of the Commission a statement under oath accompanied by the license to be endorsed, embodying the following:

- (a) Names of ships at which employed;
- (b) Call letters of stations;

(c) Types of emission used;

(d) Type of service performed as follows:

- (1) Manual radiotelegraph operation only; and
- (2) Transmitter control only; or
- (3) Combination of (1) and (2) running concurrently;

(e) Whether service was satisfactory or unsatisfactory;

(f) Period of employment;

(g) Name of master, employer, licensee, or his duly authorized agent.

NAB SAMPLE TRANSMITTER OPERATING LOGS  
AND  
PERTINENT FCC RULES AND REGULATIONS

INTRODUCTION

The Rules and Regulations of the Federal Communications Commission require that operating logs be maintained by all broadcasting stations. Requirements concerning logs of Standard Broadcast Stations appear in two parts of the Rules and Regulations, in the Standards of Good Engineering Practice, and in some instances in the instrument of authorization, i.e., license, construction permit, temporary authorization, etc. Requirements as to logs for FM and TV stations are confined to Part 3 of the Rules and Regulations.

The FCC does not place its official approval on any particular log as compared to another; its only interest is that the required entries be made in a neat and orderly fashion in accordance with the Rules and Regulations. The Sample Logs attached have been examined by Commission Engineering personnel, and are believed to meet all their requirements.

Maintenance logs are not considered in this material. In most instances, maintenance logs are found to be kept separately from the operating log. This procedure, while generally desirable, is not, however, mandatory. The logs may be combined. Also, combination (basic) logs may be used in such instances where one operator is in charge of the actual operation of an AM transmitter and an FM transmitter.

SECTION I

FCC Rules, Regulations and Standards of Good Engineering Practice Pertaining to Transmitter Logs  
Rules and Regulations

Standard Broadcast Stations

3.181 LOGS. - The licensee of each standard broadcast station shall maintain program and operating logs and shall require entries to be made as follows:

- (a) In the program log:  
\*\*\*\*\*
- (b) In the operating log:
  - (1) An entry of the time the station begins to supply power to the antenna, and the time it stops.
  - (2) An entry of the time the program begins and ends.
  - (3) An entry of each interruption to the carrier wave, its cause, and duration.
  - (4) An entry of the following each 30 minutes:
    - (i) Operating constants of last radio stage (total plate current and plate voltage).
    - (ii) Antenna current.
    - (iii) Frequency monitor reading.
    - (iv) Temperature of crystal control chamber if thermometer is used.
  - (5) Log of experimental operation during experimental period. (If regular

operation is maintained during this period, the above logs shall be kept.)

- (i) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made so as to fully describe the operation.

- (c) Where an antenna supporting structure(s) is required to be illuminated the licensee shall make entries in the radio station log appropriate to the requirements of Section 2.82<sup>1</sup> (a), (b), and (c) as follows:
  - (1) The time the tower lights are turned on and off if manually controlled.
  - (2) The time the daily visual observation of the tower lights was made.
  - (3) In the event of any observed failure of a tower light:
    - (i) Nature of such failure.
    - (ii) Time the failure was observed.
    - (iii) Time and nature of the adjustments, repairs or replacements made.

<sup>1</sup>See note on page 1-2-06 regarding Section 2.82.

- (iv) Airways Communication Station (C.A.A.) notified of the failure of any tower light not corrected within 30 minutes and the time such notice was given.
  - (v) Time notice was given to the Airways Communication Station (C.A.A.) that the required illumination was resumed.
- (4) Upon completion of the periodic inspection required at least once each 3 months:
- (i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.
  - (ii) Any adjustments, replacements, or repairs made to insure compliance with the lighting requirements.

3.182 LOGS, RETENTION OF. - Logs of standard broadcast stations shall be retained by the licensee for a period of two years, Provided, however, That logs involving communications incident to a disaster or which include communications incident to or involved in an investigation by the Commission and concerning which the licensee has been notified, shall be retained by the licensee until he is specifically authorized in writing by the Commission to destroy them; Provided, further, That logs incident to or involved in any claim or complaint of which the licensee has notice shall be retained by the licensee until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for the filing of suits upon such claims.

3.183 LOGS, BY WHOM KEPT. - Each log shall be kept by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the log when starting duty and again when going off duty. The logs shall be made available upon request by an authorized representative of the Commission.

3.184 LOG FORM. - The log shall be kept in an orderly manner, in suitable form, and in such detail that the data required for the particular class of station concerned are readily available. Key letters or abbreviations may be used if proper meaning or explanation is contained elsewhere in the log.

3.185 CORRECTION OF LOGS. - No log or portion thereof shall be erased, obliterated, or willfully destroyed within the period of retention provided by the rules. Any necessary correction may be made only by the person originating the entry who shall strike out the erroneous portion, initial the correction made, and indicate the date of correction.

3.186 ROUGH LOGS. - Rough logs may be transcribed into condensed form, but in such cases the original log or memoranda and all portions thereof shall be preserved and made a part of the complete log.

#### FM Broadcast Stations

3.281 LOGS. - The licensee of each FM broadcast station shall maintain separate program and operating logs for such station; Provided, however, If the same licensee operates an FM broadcast station and a standard broadcast station and simultaneously broadcasts the same programs over the facilities of both such stations, one program log may be maintained for both stations for such periods as both stations simultaneously broadcast the same program. Such licensee shall require entries to be made as follows:

(a) In the program log:  
\* \* \* \* \*

(b) In the operating log:

- (1) An entry of the time the station begins to supply power to the antenna, and the time it stops.
- (2) An entry of the time the program begins and ends.
- (3) An entry of each interruption to the carrier wave, its cause, and duration.
- (4) An entry of the following each 30 minutes:

(i) Operating constants of last radio stage (total plate current and plate voltage).

(ii) RF transmission line meter reading.<sup>2</sup>

(iii) Frequency monitor reading.

(5) Log of experimental operation during experimental period (if regular operation is maintained during this period, the above log shall be kept).

(i) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made to fully describe the operation.

(c) Where an antenna or antenna supporting structure(s) is required to be illuminated the licensee shall make entries in the radio station log appropriate to the requirements of section 3.270<sup>3</sup> as follows:

- (1) The time the tower lights are turned on and off if manually controlled.
- (2) The time the daily visual observation of the tower lights was made.

<sup>2</sup>This wording proposed by FCC in Notice of proposed Rule Making June 1, 1949. Wording as of July 15, 1949 was "Transmission line current and voltage."

- (3) In the event of any observed failure of a tower light:
- (i) Nature of such failure.
  - (ii) Time the failure was observed.
  - (iii) Time and nature of the adjustments, repairs or replacements made.
  - (iv) Airways Communication Station (C.A.A.) notified of the failure of any tower light not corrected within 30 minutes and the time such notice was given.
  - (v) Time notice was given to the Airways Communication Station (C.A.A.) that the required illumination was resumed.
- (4) Upon completion of the periodic inspection required at least once each 3 months:
- (i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.
  - (ii) Any adjustments, replacements or repairs made to insure compliance with the lighting requirements.

3.282 LOGS, RETENTION OF. - Logs of FM broadcast stations shall be retained by the licensee for a period of two years, Provided, however, That logs involving communications incident to a disaster or which include communications incident to or involved in an investigation by the Commission and concerning which the licensee has been notified, shall be retained by the licensee until he is specifically authorized in writing by the Commission to destroy them; Provided, further, That logs incident to or involved in any claim or complaint of which the licensee has notice shall be retained by the licensee until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for the filing of suits upon such claims.

3.283 LOGS, BY WHOM KEPT. - Each log shall be kept by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the log when starting duty and again when going off duty. The logs shall be made available upon request by an authorized representative of the Commission.

3.284 LOG FORM. - The log shall be kept in an orderly manner, in suitable form, and in such detail that the data required for the particular class of station concerned are readily available. Key letters or abbreviations may be used if proper meaning or explanation is contained elsewhere in the log.

3.285 CORRECTION OF LOGS. - No log or portion thereof shall be erased, obliterated, or

wilfully destroyed within the period of retention provided by the rules. Any necessary correction may be made only by the person originating the entry who shall strike out the erroneous portion, initial the correction made, and indicate the date of correction.

3.286 ROUGH LOGS. - Rough logs may be transcribed into condensed form, but in such case the original log or memoranda and all portions thereof shall be preserved and made a part of the complete log.

#### Television Broadcast Stations

3.681 LOGS. - The licensee of each television station shall maintain program and operating logs and shall require entries to be made as follows:

- (a) In the program log:  
\* \* \* \* \*
- (b) In the operating log:
  - (1) An entry of the time the station begins to supply power to the antenna, and the time it stops.
  - (2) An entry of the time the program begins and ends.
  - (3) An entry of each interruption to the carrier wave, its cause and duration.
  - (4) An entry of the following each 30 minutes:
    - (i) Operating constants of last radio stage of the aural transmitter (total plate current and plate voltage).
    - (ii) Transmission line current or voltage of both transmitters.
    - (iii) Frequency monitor reading.
  - (5) Log of experimental operation during experimental period (if regular operation is maintained during this period, the above logs shall be kept).
    - (i) A log must be kept of all operations during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made so as to fully describe the operation.
- (c) Where an antenna or antenna supporting structure(s) is required to be illuminated, the licensee shall make entries in the radio station log appropriate to the requirements of section 3.669<sup>3</sup> as follows:
  - (1) The time the tower lights are turned on and off if manually controlled.
  - (2) The time the daily visual observation of the tower lights was made.
  - (3) In the event of any observed failure of a tower light:
    - (i) Nature of such failure.
    - (ii) Time the failure was observed.

<sup>3</sup>See note on page 1-2-06 regarding Section 3.270 and Section 3.669.

any proceedings before the Commission as representation of operation with respect to plate or antenna current and plate voltage only, the accuracy must be the equivalent of the indicating instruments and the calibration shall be checked at such intervals as to insure the retention of the accuracy.

H. The function of each instrument shall be clearly and permanently shown on the instrument itself or on the panel immediately adjacent thereto.

#### FM - TV Stations Standards

NOTE: The Standards of Good Engineering Practice pertaining to FM and TV stations contain no comment with respect to the use of logs.

Note: Regarding Sections 2.82, 3.270 and 3.669. Section 2.82 has been deleted from Part 2 of the Rules. As of July 15, 1949 the FCC had not amended Part 3 with a rule similar to Section 2.82 as regards Standard B/C stations. Amendment of the Rules as regards FM and TV stations, however, is reflected in Sections 3.270 (FM) and 3.699 (TV). Although 2.82 is no longer in effect and reference to it will no doubt be removed in the future, it is here quoted.

"2.82 INSPECTION OF TOWER LIGHTS AND ASSOCIATED CONTROL EQUIPMENT. - The licensee of any radio station which has an antenna or supporting structure(s) required to be illuminated pursuant to the provisions of Section 303(q) of the Communications Act of 1934, as amended:

- (a) Shall make a visual observation of the tower lights at least once each 24 hours to insure that all such lights are functioning properly as required.
- (b) Shall report immediately by telephone or telegraph to the nearest Airways Communication Station or office of the Civil Aeronautics Administration any observed failure of the tower lights, not corrected within 30 minutes, regardless of the cause of such failure. Further notification by telephone or telegraph shall be given immediately upon resumption of the required illumination.
- (c) Shall inspect at intervals of at least once each 3 months all flashing or rotating beacons and automatic lighting control devices to insure that such apparatus is functioning properly as required.

### SECTION 11

#### Pertinent Facts Concerning the Format and Use of Transmitter Operating Logs

Sections 3.181 (b) and (c), 3.281 (b) and (c), and 3.681 (b) and (c), above, set forth the basic requirements as to the entries which must be made in the transmitter logs of AM, FM and TV stations.

(b)(1) To comply with paragraph (b)(1) the time (to the nearest minute) any amount of carrier is applied to the radiating system(s)<sup>4</sup> should be entered in Column 1 of the sample logs, with an appropriate phrase in the "Remarks" column such as "Carrier on." If the carrier is applied in steps, entries of voltage and currents may be made for each step or an entry in the "Remarks" column may be made as to the approximate power. The time the carrier is removed from the radiating system should be entered in Column 1 and in the "Remarks" column the words "Carrier off" may be inserted.

(b)(2) To comply with (b)(2) the time the program is applied to the carrier(s)<sup>4</sup> and the time the program is removed from the carrier(s)<sup>4</sup> should be entered in Column 1. Since the rule requires only two entries for each broadcast period appropriate entries may be made in the "Remarks" column such as "Program on" and "Program off" or "Program begins" and "Program ends." "Program on" and "Program off" times may be entered in the "Remarks" column if desired instead of in Column 1. This is often done when the

time at half-hour intervals is printed on the log.

(b)(3) To comply with (b)(3) the time of each carrier interruption must be entered in column 1, and a statement as to the cause and duration of the interruption must be placed on the log, preferably in the "Remarks" column. Upon resumption of transmission, the time the carrier is placed on the air and the time the program is resumed must be entered in Column 1 with appropriate remarks in the "Remarks" column.

(b)(4) This part requires that certain operating constants of the transmitter(s)<sup>4</sup> be entered in the log every 30 minutes during the time the carrier is on the air. The times that the readings are taken should be entered in Column 1 and the proper entries should be made in Columns 2-6 and 2-5 of the basic logs for either AM or FM or TV stations respectively (Figures 1, 4 and 5, Part III).

(b)(4)(i) In Column 2 of the sample log should be entered the total plate current of the final radio frequency stage in the transmitter. In Column 3 should be entered the plate voltage applied to the final radio frequency stage.

<sup>4</sup>Includes video and audio transmitters of TV Stations.



(b)(4)(ii) (NOTE: FOR AM STATIONS)  
Column 4 of the basic AM log is provided for the entry of the reading of the actual antenna current meter, remote antenna meter, or transmission line current meter, whichever method is elected by the station in accordance with Section 13 of the "Standards of Good Engineering Practice." Column 4 may be labeled  $I_A$  for actual antenna current,  $I_R$  for remote antenna meter reading, or  $I_T$  for transmission line current. If remote reading meters are utilized, calibration must be checked against the actual antenna current meter at least once weekly for each authorized power.<sup>5</sup> The time of the calibration check should be entered in Column 1 and the check data in the "Remarks" column.

Under Section 3.51, the indirect method of determining power may be used under certain conditions on a temporary basis. When this method is used with a series feed antenna the transmission line current may be logged in lieu of the antenna current provided the ratio between transmission line current and the antenna current is logged every 30 minutes. Further, the actual antenna current must be checked for each operating power at least once daily and logged by entering the time of the check in Column 1 and the check data in the "Remarks" column. In such instances, a column headed, for example  $I_T/I_A$  should be used. Since the indirect measurement method can be used only on a temporary basis, a permanent column for this purpose is not necessary.

In the case of a shunt excited antenna the transmission line current meter at the transmitter may be considered as a remote antenna ammeter, provided the antenna termination of the transmission line is made directly into a series circuit without parallel tuning components. The transmission feed line meter (meter in slant wire feed line or equivalent) for each authorized power. The time of this observation should be entered in Column 1 and appropriate remarks made in the "Remarks" column.

For installations using directional antenna systems, Part (b)(4)(ii), which states that merely "antenna current" should be logged, must be considered not only with paragraph 13 of the "Standards of Good Engineering Practice" but with an interpretation of requirements appearing in the instrument of authorization (D.A.Specs) to operate with a directional antenna system. Following are steps of consideration:

<sup>5</sup>Where convenient it is often advisable to check the calibration daily so that in the event of failure time would permit repair or replacement.

1. The antenna current meter reading at the common point of feed must be logged each half-hour, since this is the point where power is determined. This may be identified as  $I_{cp}$ .

2. Paragraph 13, Part B, 3, a, 6 refers to the ratio of antenna currents as determined from the indications of the phase monitor. These indications must be the current flowing in each phase monitor sampling loop circuit with no other shunt circuits of any nature employed. Although no specific rule states that current ratios must be logged, such ratios are included in the instrument of authorization and, for the protection of the licensee, logging of it appears advisable.

If loop currents are logged, base currents must be read and logged once each day for each authorized power. Time of these observations should be entered in Column 1 and data in the "Remarks" column. In the event remote reading meters are used in a directional antenna system to read base currents, a calibration check between meters must be made at least once each week. It is, however, general practice at most stations to make this calibration check once daily.

3. If a phase monitor is employed, relative phase indications between the elements must be logged at least once each hour. This requirement appears only on certain instruments of authorization.

4. In the interest of consistency and to prevent confusion it is suggested that each station select a definite system of identifying elements in a DA system such that each tower can be easily and readily associated with the element identification given in the instrument of authorization. In preparing the log format, this identification should appear at the top of the column used for that tower.

(b)(4)(ii) (NOTE: FOR FM AND TV STATIONS)  
On FM and TV installations it is required that transmission line voltage or current be logged each half hour. Figure 5 (TV Log) indicates the use of "Reflectometer Unit" as found in one particular make of television transmitter. If transmission line voltmeters or ammeters are used, Columns 5-6, 8-9 may be deleted and one column under both audio and video transmitters added for transmission line voltage or current.

(b)(4)(iii) The frequency monitor reading should be entered in Column 5 of the AM and FM logs. Columns 4 and 7 of Figure 5 (TV Log) must be filled in with the frequency deviation in cps of the audio and video carriers respectively.



(b)(4)(iv) If a thermometer is used in the crystal chamber of the automatic frequency control equipment of the transmitter, the

temperature reading should be entered in Column 6 (Figure 1 only).

### SECTION III

#### Explanations and Illustrations of Sample Logs

Figure 1. BASIC AM LOG. The columns set forth in this form cover the basic AM Requirements, the form being suitable for stations having no special log requirements occasioned by the use of directional antennas. Column 6, "Crystal Temperatures," is required only when a thermometer is used in connection with the crystal temperature control.

Figure 2. This figure consists of three sections to be added to the BASIC AM LOG if directional antennas are employed. The number of columns to be employed would be equal to the number of antennas used in the directional array.

(1) Antenna Current -- as may be read on remote reading meters. If this method is elected by the station, calibration checks must be made at least once weekly. Most stations, however, provide this calibration check daily.

(2) Current Ratios. Ratios are not required to be logged. It is the usual practice to log only currents in the sampling loops, from which ratios may be determined when needed. However, if it appears desirable that operators compute ratios, this column may be used. If sampling loop currents are used, tower base currents must be read daily for each power used. The common point current must also be checked in the normal manner.

(3) Phasing Relation. This group of columns must be used if a phase monitor is employed. The readings should follow those values set forth in the instrument of authorization and should show degrees of lead or lag with respect to the reference tower.

If monitoring point readings are required add additional columns.

The "Remarks" column would follow the final column on the chart.

Figure 3. This is a sample log for a standard station using a three-element directive array at night and non-directional operation daytime.

Figure 4. BASIC FM LOG. The columns set forth in this sample log cover the basic FM requirements.

Figure 5. BASIC TV LOG. This is a sample log for a television station. Although the rules are somewhat ambiguous as to the frequency monitor reading, the frequency deviation of both carriers must be checked and logged every 30 minutes.

#### Important Points of Consideration in Designing an Operating Log Format (Sample abbreviations shown in brackets)

1. Be sure the log is properly identified as to station location and frequency. It is sometimes convenient to print the transmitter latitude and longitude in the log.
2. Put the date in a convenient place in the event reference must be made to a specific day.
3. If abbreviations of any nature are used, be certain that each abbreviation is fully explained on the log and as a permanent part of the log. This is generally done at the bottom or on the back of each page when the logs are printed.
4. Where directive arrays are used, identify each tower in a manner consistent with the instrument of authorization.
5. Keep the log neat, precise, simple, and free of extraneous remarks.
6. Provide sufficient room for a "Remarks" column, which may be used for the following:
  - a. Operator's signature (not initials) when going on and off duty, if not placed in separate box.
  - b. Notation "Carrier" on and off. (CON) (COF)
  - c. Notation "Program" on and off. (PON) (POF)
  - d. Remarks as to cause of carrier interruption.
  - e. Calibration checks on remote reading meters, etc. (CRRM)
  - f. Observation of tower lights and remarks as to steps taken if tower lights fail.
  - g. Remarks as to any unusual occurrences affecting transmissions.
  - h. Notations and initialing in the case of corrections in log entries.
  - i. Time of power change if required.

AM STATION CALL LETTERS  
 TRANSMITTER OPERATING LOG

12 — KILOCYCLES: 5 KW — DAY 1 KW — NIGHT

DATE \_\_\_\_\_ 19 \_\_\_\_\_

CITY AND STATE \_\_\_\_\_

① TIME	② PLATE CURRENT FINAL STAGE	③ PLATE VOLTAGE FINAL STAGE	④ ANTENNA CURRENT AMPS.	⑤ FREQUENCY DEVIATION ± CYCLES	⑥ CRYSTAL TEMP. °C	REMARKS:

FIGURE 1  
 BASIC AM SAMPLE

COLUMNS 1 TO 6 OF BASIC AM LOG

1				2			3		REMARKS
ANTENNA CURRENT				CURRENT RATIO			PHASING RELATION		
COMMON POINT	1	2	3	4	2/1	3/1	4/1		

FIGURE 2



DATE \_\_\_\_\_ 19 \_\_\_\_

TIME	$E_p$	$I_p$	$F_d$	ANTENNA CURRENTS			PHASE RELATION		REMARKS:
				$I_{cp}$	$I_1$	$I_2$	$I_3$	$T_1/T_2$	

ABBREVIATIONS:

$E_p$  - Final Stage Plate Voltage - Kilovolts  
 $I_p$  - Final Stage Plate Current - Amperes  
 $F_d$  - Frequency Deviation - Cycles per Second  
 $I_{cp}$  - Common Point Antenna Current - Amps - Remote

$I_1, I_2, I_3$  - Phase Monitor Sampling Loop Currents.  
 $I_1$  Loop Current Used In Lieu Of Antenna Current On Non-DA Operation.  
 $T_1/T_2$  - Phase Difference Between Tower #1 and Tower #2.  
 $T_1/T_3$  - Phase Difference Between Tower #1 and Tower #3.

FM STATION CALL LETTERS  
 TRANSMITTER OPERATING LOG  
 CHANNEL 269, — 101.7 mc — POWER | kW

① TIME	② PLATE CURRENT FINAL STAGE	③ PLATE VOLTAGE FINAL STAGE	④ TRANSMISSION LINE * CURRENT	⑤ FREQUENCY DEVIATION ± CYCLES	REMARKS :

\* OR VOLTAGE

FIGURE 4

BASIC FM SAMPLE

# TV STATION CALL LETTERS TRANSMITTER OPERATING LOG

CHANNEL \_\_\_\_\_

DATE \_\_\_\_\_

VIDEO FREQUENCY \_\_\_\_\_

CITY AND STATE \_\_\_\_\_

AUDIO FREQUENCY \_\_\_\_\_

TIME ①	AUDIO TRANSMITTER ①					VIDEO TRANSMITTER			REMARKS ②
	E <sub>p</sub> ②	I <sub>p</sub> ③	F <sub>d</sub> ④	REFLECTOMETER ①		F <sub>d</sub> ⑦	REFLECTOMETER ②		
				INCI.	REFL.		INCI.	REFL.	
	⑤	⑥	⑧	⑨					

FIGURE 5.

BASIC TV SAMPLE

**ABBREVIATIONS**

E<sub>p</sub> - Plate Voltage Final Stage  
 I<sub>p</sub> - Plate Current Final Stage  
 F<sub>d</sub> - Frequency Deviation in  
 Cycles Per Second

① Audio: \_\_\_\_\_ microamperes incident is  
 equal to \_\_\_\_\_ watts.  
 ② Video: \_\_\_\_\_ microamperes incident is  
 equal to \_\_\_\_\_ watts.  
 ① and ② calibrated using dummy load  
 beyond side band filter.