

6. The radiation through the power supply connection can be prevented by means of the proper line filter. Radiation from the internal circuits can be prevented by means of suitable metallic cases. The radiation from the output circuits can be reduced to a level so as not to cause interference to radio communications by means of suitable metallic shielding, if the shielding encloses the entire apparatus and is of sufficient dimensions that large eddy currents are not produced in the shield.

7. In many cases it may not be practicable to employ the required shielding.

8. The frequencies used for such apparatus may be any frequency in the useful radio spectrum. However, many modern diathermy units (which cause most long-distance radio interference) operate on frequencies from approximately 10,000 to 20,000 kilocycles. Operations on other frequencies mainly cause interference to local or moderate distance reception.

9. In cases where it is not practicable to shield the entire apparatus to control the radiation, then the only means of operating machines without causing interference would be to use frequencies which are not assigned to any radio services.

10. The usual diathermy machine is essentially a radio transmitter of the self-excited oscillating type and generally uses self-rectifying plate power supply. Due to the inherent instability of the oscillator circuits, the wide variation in voltage during a plate supply cycle, and the different uses to which the output circuit is subject, the operating frequency varies during normal operation over very wide bands, possibly one or two megacycles, when operating on a frequency of approximately 15 megacycles.

11. All diathermy machines designed for the same service could operate on the same frequency without impairing their usefulness, since their operation is not affected by radiation from other machines. To operate on a fixed frequency would require additional apparatus and cost in that automatic frequency control would be required to maintain the operating frequency within at least 1/20 per cent to be effective. At 15 megacycles this would require a band width of 15 kilocycles, or virtually one communication channel.

12. From the best information available diathermy operation should be restricted until the art advances to the point where apparatus may be designed to completely suppress interfering radiations, to three frequencies, namely, approximately 12 megacycles, 25 megacycles, and 50 megacycles.

13. Such apparatus as carrier call systems and certain types of induction furnaces and similar apparatus using medium or low frequencies should be required to restrict the generation of harmonics and make the necessary test to determine that radiation of signal does not result beyond a prescribed level.

14. Each subscribing country should make the necessary regulations to require the complete shielding or operation on designated frequencies of all non-radio apparatus which generate radio frequency electric energy as an essential to its operation but does not engage in radio communication.