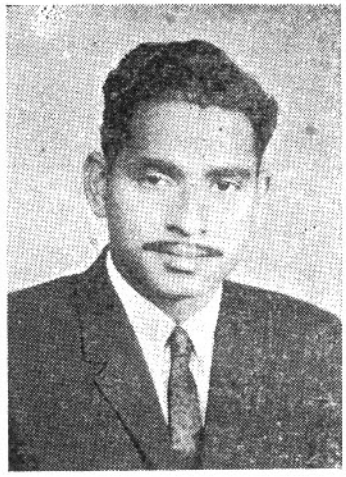
NEW REGULATIONS OF MARINE RADIO - 1973 ONWARDS



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The World Administrative Conference held in 1967 has decided to make certain important regulations in the use of the types of marine radio transmissions from 1973 onwards. Though these regulations will create financial aad technical problems among the existing users of marine radio, they are intended for a more effective and efficient radio communication. The important regulations made are that (1) from July 1, 1973 onwards no more D.S.B. equipment will be allowed for installation, (2) all transmissions on frequencies above 4 M. Hz. by coast and ship stations in the D.S.B. will be discontinued from December 31, 1977, (3) all transmissions below 4 M. Hz will be discontinued from December 31, 1981. (4) ship stations which change to SSB before the restricted date will have to retain a capability of communicating with other stations of D.S.B. mode of transmissions until January 1, 1978 in the case of those above 4 M. Hz and January 1, 1982 in the case of those below 4 M. Hz. The above decision was approved by 140 nations on a common time schedule. All nations are expected to begin the first change over by January 1, 1972 and complete the transition by January 1, 1973. The maximum power allowed in VHF / FM equipments will be 25 watts all over the world.

What is D.S.B.

In the earlier transmitters a carrier wave was transmitted interrupted by Morse Key. Since there is no superimposition of signals here, this has got the minimum band width. Continuous transmission of the carrier is named A_1 transmission and the interrupted one carrying intelligence of coded form is called A_2 transmission. Radio transmission with the superimposition of voice as the signal is called A_3 transmission. When sound is superimposed on the carrier wave, its band width is affected depending on the frequency of the sound. As a standard this is taken to be 3 KHz. Hence when sound waves of 3 KHz band width is superimposed on a carrier wave of say 2 MHz, the transmitted power will have three components (as shown in Fig.) namely (1) the carrier of 2 M. Hz, (2) the difference between the carrier and the sound wave ie. 1997

K. Hz. and (3) the sum of the two frequencies ie. 2003 K. Hz. Now the actual band has got a width of 6 K. Hz. starting from 1997 K. Hz. to 2003 K. Hz. The 3 K. Hz. bands on either side of the carrier frequency are called Lower Side Band and Upper Side Band. Since it has

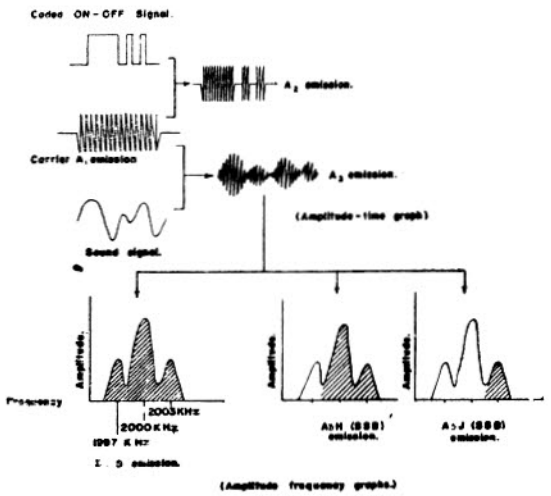

Fig. 1. The figure shows the nature (amplitude-time graphs) of on-off signals and sound signals along with their corresponding modulated A2 and A3 emissions. The three different forms of A3 emission such as DSB, A3H (SSB) and A3J (SSB) are shown as amplitude-frequency graphs. The shaded regions indicate the transmitted portions.

got two side bands, this transmission is called Double Side Band.

S.S.B: and its advantages

On analysis of the radiated energy it can be seen that 50 per cent of the total energy transmitted is carried by the carrier wave while 25 Per cent each shared by the side bands. From theoretical analysis it can be seen that all the necessary information transmitted is available in any of the side bands. During the past decade techniques have been developed for the transmission of either one of the side bands and its reception.

Two types of transmissions are made in S.S.B. transmitters named A_3J and A_3H. As described above any one of the side bands contain the necessary signals and its transmission is suffilient for communicating the informations. Transmissions of one side band alone is named A_3J emission. Since the carrier is absent, the energy transmitted will not be continuous and it will be difficult to tune a receiver to a SSB signal of A_3J type. Therefore for the sake of tuning of both transmitter as well as receiver, provisions are usually given in SSB equipments to transmit the carrier along with one of the side bands, if required. This type of transmission is called A_3H. Usually the upper side bands are used in both A_3J and A_3H. emissions.

S.S.B. transmitters have got several advantages over the other type. The required band width is reduced to less than half from that of D.S.B. This enables to double the number of stations in a limited band thereby solving the problem of interference caused by increased number of transmissions, to a considerable extend. The second advantage is the reduced radiated power for the same range of transmission.

Since the transmission of the carrier wave and one of the side bands are unnecessary and hence blocked, the power required for their transmission is saved. That is, with the same energy as that of D.S.B., S.S.B. transmissions will be about 3 times more powerful. This enables the manufacturers to produce transceiver sets with higher transmitting capacity at reduced input power consumption. The third advantage is increased signal to noice ratio in reception. The noice level in the received signal depends also on its band width. Smaller the band width lower the noice and hence higher signal to noice ratio. But since the band is very narrow, the equipment becomes technically more complicated, precise and expensive. But the advantages of the S.S.B. outweigh the added cost of the equipment.

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