

DCS (Digital Coded Squelch)

DCS (Digital Coded Squelch) is digital data or code word that is transmitted with the voice audio. This data is sub-audible with most of its energy below 300Hz. However it does have a wide bandwidth from 2 to 300 Hz. Unlike CTCSS (Continuous Tone Coded Squelch System) which uses continuous tones below 300 Hz., DCS uses digital data or code words. Each code word is unique and all code words may be used on the same channel without interference. At the end of the radio transmission and about 1/2 second before the transmitter un-keys, the radio will encode a 134 Hz tone that serves as a turn off code. The FM deviation level of DCS data should be in the range of 500 to 800 Hz.

Unlike CTCSS, DCS signal spectrum occupies considerable more bandwidth. A poor low frequency response in the transmitter or receiver may not seriously distort a single frequency tone signal but may seriously degrade a wide band signal containing multiple frequency components. The distortion risk is especially high if the frequency response delays the wide band frequency components.

DCS is operated at a low baud rate (134.4 bits per second) and because DCS may have extended periods of all ones and zeros almost all components in the transmitter and receiver chain must be coupled down to at least 2 Hz or lower. This requirement means that certain transmitters and receivers must be modified before they are capable of DCS operation. Phase modulators, in particular, need special consideration because they theoretically are incapable of being directly modulated by dc, unlike direct FM modulation methods. Low frequency response is the primary requirement for DCS systems.

You will find that it is extremely important for the receiver and transmitter to be on frequency to achieve maximum performance of the DCS function. Errors in the transmitter and receiver frequencies show up at the discriminator output as a step function. Because of the long time constant required for the low frequency response, a step function can block the decoder momentarily. With DCS, error correction is necessary. But if too many errors occur, you may experience some blocking out of the decoder. Errors can occur because of unwanted low frequency energy. The DCS decoders can be affected by voice energy that falls below 300 Hz. Some radios do not remove this energy before transmission and can cause voice blocking of the decoder. A sub audio filter that removes this low frequency energy before the audio is re-transmitted is necessary for reliable DCS operation.

Before you start modifying your radio to operate DCS, make sure your service monitor is DCS capable. Some older monitors require modifications to obtain the low frequency audio response needed for DCS operation. If in doubt, contact the manufacturer.

The following is a table of standard DCS codes.

023	131	251	371	532
025	132	252	411	546
026	134	255	412	565
031	143	261	413	606
032	145	263	423	612
036	152	265	431	624
043	155	266	432	627
047	156	271	445	631
051	162	274	446	632
053	165	306	452	654
054	172	311	454	662
065	174	315	455	664
071	205	325	462	703
072	212	331	464	712
073	223	332	465	723
074	225	343	466	731
114	226	346	503	732
115	243	351	506	734
116	244	356	516	743
122	245	364	523	754
125	246	365	526	



BRYAN WADSWORTH
TOLL FREE # (888) 280-5290
E-Mail: wb9mcw@gmail.com
CELL PHONE (815) 790-4494
SKYPE PHONE = [bryan.wadsworth](https://www.skype.com/people/bryan.wadsworth)
FAX (815) 363-6056