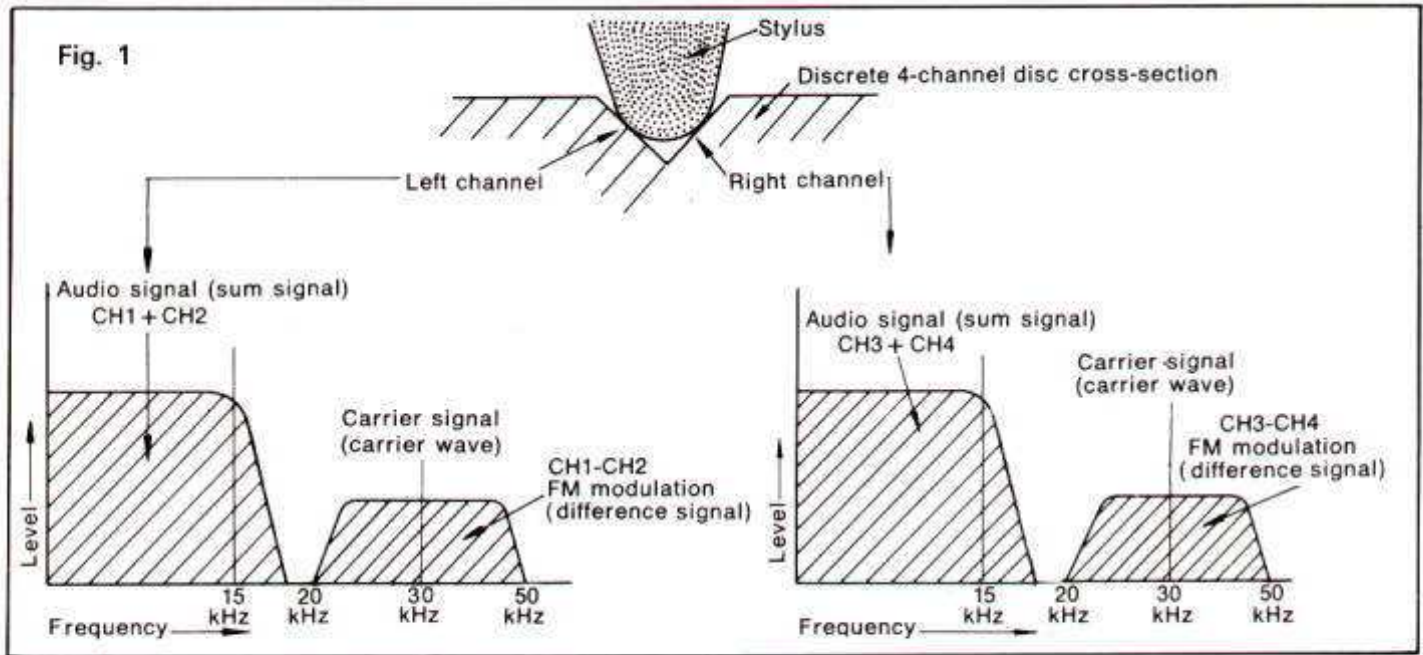


A BRIEF EXPLANATION OF THE CD-4 SYSTEM

Recording



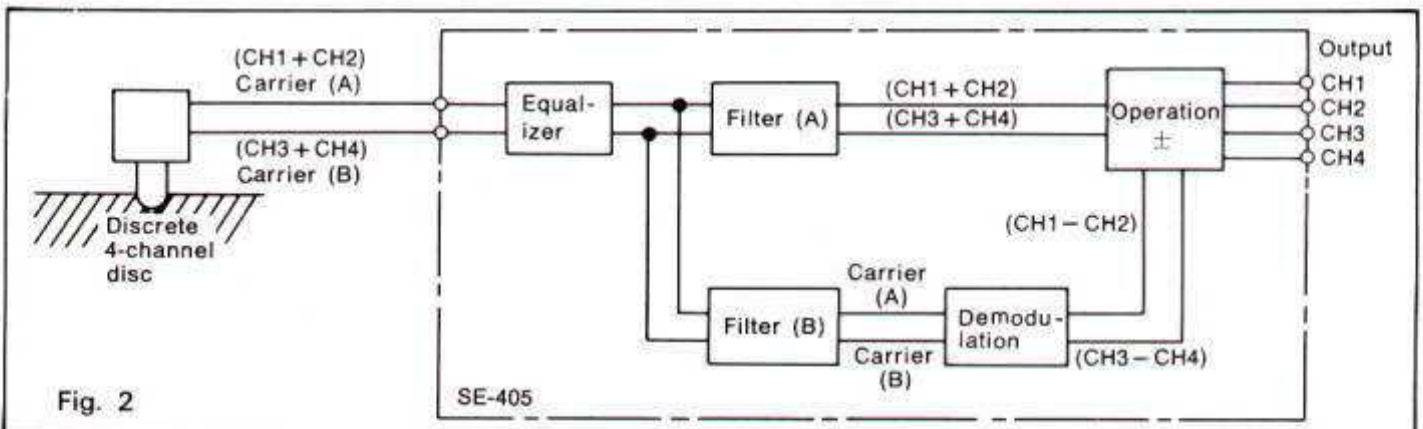
The following is a brief explanation of how four sounds, each independent of the other, are obtained from one groove of a disc.

By studying the disc cross-section shown in figure 1, it will be recognized as the 45-45 system, the same as conventional stereo. On the left channel of the sound groove, however, are inscribed both the audio signal (the sum signal)—made up of channels one and two—as well as the carrier signal (the carrier)—which has been FM and

PM modulated by the audio signal (the difference signal) made up of the difference between CH1 and CH2.

(FM = frequency modulation; PM = phase modulation)
Of these two signals, the carrier signal varies from 20 kHz to 50 kHz as a result of being FM modulated. In the same way, the right channel is inscribed with the CH3+CH4 audio signal and with the carrier signal—which has been modulated by the signal which is the difference between CH3 and CH4.

Playback



The block diagram will serve to explain how four independent sounds are picked up from the discrete 4-channel disc. First, both the sum signal of CH1+CH2 and the carrier signal (which has been modulated by the difference signal of CH1-CH2) are picked up from the left channel of the disc by the CD-4 cartridge and are sent to the SE-405 unit, where they enter, without change, filter A and filter B after passing through the equalizer (RIAA curve). These filters separate the signals into (1) the sum signal of CH1+CH2 and (2) the modulated carrier signal. The sum signal enters the operation circuitry without change, while the modulated carrier signal passes through the demodulation circuitry

and enters the operation circuitry, becoming a difference signal CH1-CH2 (which is a modulated wave).

Then addition and subtraction are accomplished by the operation circuitry.

Specifically:

Addition: $(CH1 + CH2) + (CH1 - CH2) = 2(CH1)$

Subtraction: $(CH1 + CH2) - (CH1 - CH2) = 2(CH2)$

By this process, CH1 and CH2 are sent to the output.

In the same way, the signal picked up from the right channel of the disc is sent out as CH3 and CH4. This explanation has, we hope, served to explain how four signals are picked up from one groove of a disc as completely independent sounds.