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(72) Moon, Heon-Hee, KR

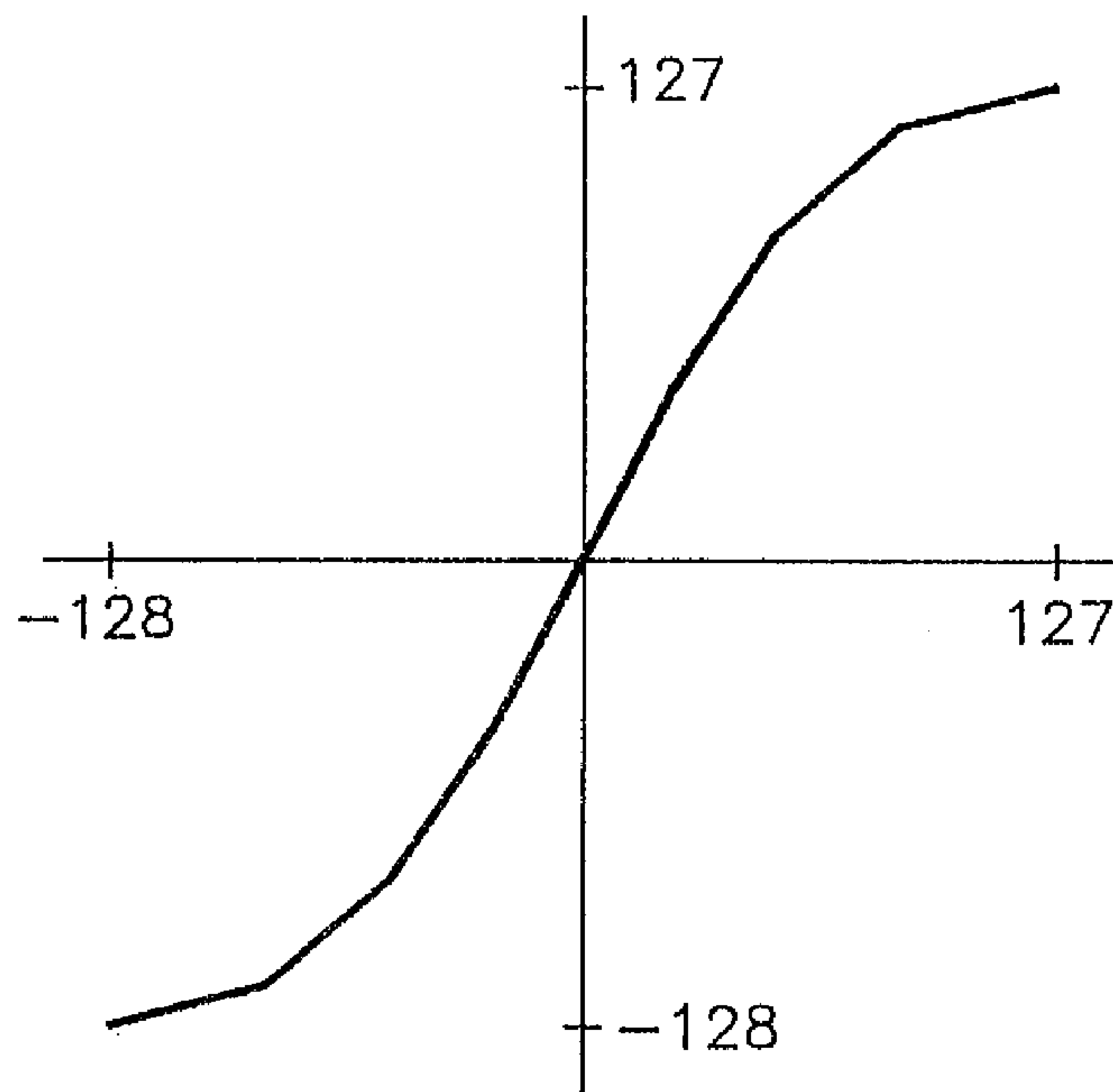
(73) SAMSUNG ELECTRONICS CO., LTD., KR

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(54) **SYSTEME D'EMISSION-RECEPTION DE SIGNAUX VIDEO A
INTERPOLATION D'UN FACTEUR ADAPTATIF**

(54) **SYSTEM FOR TRANSMITTING AND RECEIVING VIDEO
SIGNALS USING INTERPOLATION OF ADAPTIVE FACTOR**



(57) A system for transmitting and receiving video signals compressed into frequency band blocks, has an adaptive modulation circuit (410 or 450) and an adaptive demodulation circuit (520, 550). The adaptive modulation circuit (410) receives the signal blocks to obtain a block adaptive factor f_1 and an index signal ID1, transmits the index signal ID1 therefor to a channel, interpolates the block adaptive so as to obtain a picture element adaptive factor, and selects a final adaptive factor among the block and picture element adaptive factors according to the video signals of the peripheral signal blocks. The adaptive demodulation circuit (520) converts the index signal ID1 into the corresponding block adaptive factor f_1 , and interpolates the block adaptive factor to produce the picture element adaptive factor, so as to selectively provide the block or picture element factor according to the video signals of the peripheral blocks.



ABSTRACT OF THE DISCLOSURE

A system for transmitting and receiving video signals compressed into frequency band blocks, has an adaptive modulation circuit (410 or 450) and an adaptive demodulation circuit (520, 550). The adaptive modulation circuit (410) receives the signal blocks to obtain a block adaptive factor f_1 and an index signal ID_1 , transmits the index signal ID_1 therefor to a channel, interpolates the block adaptive so as to obtain a picture element adaptive factor, and selects a final adaptive factor among the block and picture element adaptive factors according to the video signals of the peripheral signal blocks. The adaptive demodulation circuit (520) converts the index signal ID_1 into the corresponding block adaptive factor f_1 , and interpolates the block adaptive factor to produce the picture element adaptive factor, so as to selectively provide the block or picture element factor according to the video signals of the peripheral blocks.

TITLE OF THE INVENTION

5 SYSTEM FOR TRANSMITTING AND RECEIVING VIDEO SIGNALS USING
INTERPOLATION OF ADAPTIVE FACTOR

BACKGROUND OF THE INVENTION

10 The present invention relates to a system for transmitting and receiving video signals, and more particularly an apparatus for selectively modulating and demodulating the video signals by obtaining block and picture element adaptive factors of the video signal blocks.

15 Conventionally, the adaptive modulation is employed to suppress noise added to a video signal during transmission, wherein a transmitted video signal of low level is enhanced in the transmitter, and then reduced in the receiver by the amount enhanced at the transmitter. A typical system using such a conventional adaptive
20 modulation for transmitting and receiving a video signal is shown in Fig. 1, and the signal converting characteristics are shown in Figs. 2A and 2B.

Referring to Fig. 1, a system for transmitting and receiving a
25 video signal by employing the conventional adaptive modulation comprises an encoder at the transmission side and a decoder at the receiving side.

The encoder comprises a first adaptive modulator 110, first
30 delay circuit 120, first multiplier 130, first non-linear converter 140, second adaptive modulator 150, second delay circuit 160, second multiplier 170, and second non-linear converter 180. The first adaptive modulator divides a video signal of low frequency band received via a low band input terminal 101 into given adaptive
35 intervals, and finds out the maximum value of the signal in the respective intervals, so as to produce a first adaptive factor f_1 and first index signal ID1. The first delay circuit 120 delays the video signal of low frequency band for the period during which the first adaptive factor f_1 is obtained. The first multiplier 130 multiplies

the delayed video signal of low frequency band by the first adaptive factor f_1 . The output of the first multiplier 130 is non-linearly converted by the first non-linear converter 140. Likewise, the second adaptive modulator 150 divides a video signal of high frequency band received via a high band input terminal 102 into given adaptive intervals, and finds out the maximum value of the signal in the respective intervals, so as to produce a second adaptive factor f_2 and second index signal ID_2 . The second delay circuit 160 delays the video signal of high frequency band for the period during which the second adaptive factor f_2 is obtained. The second multiplier 170 multiplies the delayed video signal of high frequency band by the second adaptive factor f_2 . The output of the second multiplier 170 is non-linearly converted by the second non-linear converter 180.

Meanwhile, the decoder comprises a first reverse non-linear converter 210, first adaptive factor generator 220, first divider 230, second reverse non-linear converter 240, second adaptive factor generator 250, and second divider 260. The first reverse non-linear converter 210 clips the portions of the received signal below a given level and non-linearly converts the adaptive modulated video signal of low frequency band, which is received via a low band receiving input terminal 201, into a signal to have the reverse characteristics compared to the received signal. The first adaptive factor generator 220 generates the first adaptive factor f_1 corresponding to the first index signal ID_1 received via a first index receiving terminal 202. The first divider 230 divides the video signal of low frequency band of the first reverse non-linear converter 210 by the first adaptive factor f_1 so as to recover the original video signal. The second reverse non-linear converter 240 non-linearly clips the portions of the received signal below a given level, and converts the adaptive modulated video signal of high frequency band received via a high band receiving input terminal 203 into a signal to have the reverse characteristics compared to the received signal. The second adaptive factor generator 250 generates the second adaptive factor f_2 corresponding to the second index signal ID_2 received via a second index receiving terminal 204. The second divider 260 divides the video signal of high frequency band from the second reverse non-

linear converter 240 by the second adaptive factor f_2 so as to recover the original video signal.

5 Figs. 2A and 2B show the conversion characteristics of the low and high frequency band video signals of the first and second non-linear converter 140 and 180, respectively.

10 In such conventional transmitting/receiving system for a video signal, the encoder divides the video signal into small blocks of sub-bands, and multiplies each of the blocks by respective adaptive factor to transmit. Meanwhile, the decoder divides the picture element of each of the received blocks by the adaptive factor. This method is specifically disclosed in Korean Patent Serial No. 91-1023 granted to the applicant of the present invention.

15 However, using this system, as shown in Fig. 3B, results in the block effect, which causes the boundary of a picture to show blocks due to additive noises when recovering the original video signal, because if the difference between the adaptive factors increases in
20 the boundary portions of the picture considering the video signal in one dimension, there considerably differs the degree of suppressing the additive noises.

SUMMARY OF THE INVENTION

25 It is an object of the present invention to provide a means for decreasing the block effect, whereby a block adaptive factor is obtained according to the maximum value of the video signal blocks and is interpolated to produce a picture element adaptive factor so
30 as to selectively subject the video signal to the adaptive modulation considering the peripheral blocks.

It is another object of the present invention to provide a means for decreasing the block effect, whereby the received adaptive factor
35 is interpolated so as to provide a picture element adaptive factor, thus selectively subjecting the received video signal to adaptive demodulation.

According to the present invention, transmitting/receiving system for video signals compressed into frequency band blocks, comprises:

5 (a) an adaptive modulation circuit for receiving the video signals of the respective blocks to obtain a block adaptive factor and an index signal corresponding to the block adaptive factor, transmitting said index signal to a channel, interpolating the block adaptive factor so as to obtain a picture element adaptive factor,
10 and selecting a final adaptive factor among the block and picture element adaptive factors according to the video signals of the peripheral blocks;

15 (b) a delay circuit for delaying the video signals during the final adaptive factor being produced;

 (c) a multiplier for multiplying the video signal of the delay circuit by the final adaptive factor;

20 (d) a non-linear converter for non-linearly converting the video signals of the multiplier, and for transmitting converted signal to the channel;

25 (e) a reverse non-linear converter for clipping the portions of the adaptive modulated video signals below a given level, and for converting the adaptive modulated video signals non-linearly but reversely with the non-linear converter;

30 (f) an adaptive demodulation circuit for converting the index signal into the corresponding block adaptive factor, and interpolating said block adaptive factor to produce the respective picture element adaptive factor being equal to that of the adaptive modulation circuit, so as to selectively provide the block or picture element factor according to the video signals of the peripheral
35 blocks; and

 (g) a divider for dividing the video signals of the reverse non-

linear converter by the adaptive factor of the adaptive demodulation circuit so as to recover the original block video signals.

BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

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The invention itself, as well as other features and advantages thereof, will best be understood by reference to the following detailed description of a particular embodiment, read in connection with the accompanying drawings, wherein:

10 Fig. 1 is a block diagram for illustrating a conventional system for modulating and demodulating a video signal;

Fig. 2 shows graphs for illustrating the characteristics of the non-linear conversion of a video signal by Fig. 1;

15 Fig. 3 illustrates the relationship between the video signal blocks and the adaptive factor;

Fig. 4 is a block diagram for illustrating a system for modulating and demodulating a video signal according to the present invention;

20 Fig. 5 is a block diagram for more specifically illustrating the adaptive modulation circuit of Fig. 4; and

Fig. 6 shows the table of the block adaptive factors.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

25 Referring to Fig. 4, a first adaptive modulation circuit 410 receives video signals of low frequency compressed into band blocks to obtain a first block adaptive factor and a first index signal ID1 corresponding to the first block adaptive factor, and thereafter to transmit the first index signal ID1 to channel. Then the first
30 adaptive modulation circuit 410 interpolates the first block adaptive factor so as to obtain a picture element adaptive factor, and selects as a first adaptive factor f1 either the block adaptive or picture element adaptive factors according to the video signals of the peripheral blocks. A first delay circuit 420 is to delay the video
35 signals of low frequency band during the first adaptive factor f1 being produced. A first multiplier 430 is to multiply the video signal of the first delay circuit 420 by the first adaptive factor

f1. A first non-linear converter 440 non-linearly converts the video signals from the multiplier 430 to transmit to the channel.

5 A second adaptive modulation circuit 450 receives video signals of high frequency compressed into band blocks to obtain a second block adaptive factor and a second index signal ID2 corresponding to the second block adaptive factor, and thereafter to transmit the second index signal ID2 to the channel. Then the second adaptive modulation circuit 450 interpolates the second block adaptive factor
10 so as to obtain a picture element adaptive factor, and selects either the block adaptive or picture element adaptive factors according to the video signals of the peripheral blocks, to thereby produce a second adaptive factor f2. A second delay circuit 460 is to delay the video signals of high frequency band during the second adaptive
15 factor f2 being produced. A second multiplier 470 is to multiply the video signal from the second delay circuit 460 by the second adaptive factor f2. A second non-linear converter 480 non-linearly converts the video signals of the second multiplier 470 to transmit to the channel. All these component circuits constitute the encoder.

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Meanwhile, the component circuits of the decoder are as follows:
A first reverse non-linear converter 510 is to clip the portions of the transmitted video signals below a given level, and to convert the adaptive modulated video signals of low frequency band non-linearly
25 in a reverse mode with respect to the first non-linear converter 440. A first adaptive demodulation circuit 520 converts the first index signal ID1 into the corresponding block adaptive factor, thereby interpolating the block adaptive factor to produce the respective picture element adaptive factor being equal to in the adaptive
30 interpolator 413 of the encoder (following described). Thereafter either the block or picture element factor is selectively produced as the first adaptive factor f1 according to the video signals of the peripheral blocks. A first divider 530 divides the video signals of the first reverse non-linear converter 510 by the first adaptive
35 factor f1 from the first adaptive demodulation circuit 520 so as to recover the original block video signals.

A second reverse non-linear converter 540 is to clip the portions of the video signals below a given level, and to convert the adaptive modulated video signals of high frequency band non-linearly in reverse mode with respect to the second non-linear converter 480.

5 A second adaptive demodulation circuit 550 converts the second index signal ID2 into the corresponding block adaptive factor, and interpolates the block adaptive factor to produce the respective picture element adaptive factor being equal to in the adaptive interpolator 413 of the encoder, so as to selectively provide the

10 block adaptive or picture element factor as the second adaptive factor f2, according to the video signals of the peripheral blocks. A second divider 560 divides the video signals of the second reverse non-linear converter 540 by the second adaptive factor f2 of the second adaptive demodulation circuit 550 so as to recover the

15 original block video signals.

The respective first and second adaptive modulation circuit 410 and 450 is more specifically described with reference to Fig. 5. A maximum value detector 411 detects the maximum value of the received

20 video signal block. A block adaptive factor calculator 412 produces the block adaptive factor corresponding to the maximum value from the maximum value detector 411 and the index signal corresponding to the block adaptive factor. An interpolator 413 interpolates the block adaptive factor so as to produce the respective picture element

25 adaptive factor. A subtractor 414 produces the difference signal between the block adaptive and picture element adaptive factors. An absolute value converter 415 converts the output of the subtractor 414 into its absolute value. A comparator 416 compares the output of the absolute value converter 415 with a given reference signal so as

30 to provide a first selection signal for selecting the output of the interpolator 413 or second selection signal for selecting the block adaptive factor according to whether the output of the absolute value converter is greater or less than the reference signal. A selection circuit 417 selects either the picture element or block adaptive

35 factor according to whether the output of the comparator 416 is a first or second select signal.

The adaptive factor for a low frequency band video signal is shown in the table of Fig. 6A. The address levels extend from 0 to 127, index from 0 to 7, and the values of the first adaptive factors f_1 corresponding to each number of the index are 1,2,3,4,8,16,32,64.

5 The logic of the table of Fig. 6A is stored into the block adaptive factor calculator 412 of the first adaptive modulation circuit 410 shown in Fig. 4.

The adaptive factor of a high frequency band video signal is shown in the table of Fig. 6B. The address levels extend from 0 to 127, index from 0 to 7, and the values of the second adaptive factors f_2 corresponding to each number of the index are $1/4, 1/2, 1, 2, 4, 6, 10, 31$. The logic of the table of Fig. 6B is stored into the block adaptive factor calculator 412 of the second adaptive modulation circuit 450 shown in Fig. 4.

15

In operation, an adaptive factor of each block is obtained and interpolated so as to produce a respective picture element adaptive factor for each of the picture elements of the block. If the present position of the block is assumed as (i, j) as shown in Fig. 3A, the signal of the block position (i, j) and the adaptive factors of the peripheral blocks (left, right, up and down side blocks) are employed to obtain the adaptive factor of each of the picture elements. In this case, the final adaptive factor becomes relatively greater or less by the interpolation, according to whether the adaptive factor of the present block is less or greater than the adaptive factor of the peripheral blocks. Hence, if the difference between the current block adaptive factor and the peripheral block adaptive factor becomes great, the picture element adaptive factor is selected as the final adaptive factor. However, if the final adaptive factor appears to have a value too greater or smaller than the original block adaptive factor and therefore causes degradation of the picture quality in the flat portions of the video signal in adaptive demodulation, the original block adaptive factor is used as the final adaptive factor.

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Hereinafter, the adaptive modulation and demodulation are more

specifically described.

The video signal is coded into sub-bands to provide the block video signals of high and low band. The block video signal of low band is applied simultaneously to the first adaptive modulation circuit 410 and first delay circuit 420. The first adaptive modulation circuit 410 finds out the maximum value of the low band video signal within a given adaptive block interval, and compares the maximum value with the transmittable maximum allowable value in the interval, so as to produce the block adaptive factor for subjecting the low band video signal to the adaptive modulation. The block factor should meet the following Equation.

$$\text{Block Adaptive Factor} = \frac{K}{|h_{\max}|}$$

Where K is the transmittable maximum allowable value for the low band video signal, and $|h_{\max}|$ the absolute maximum value of the signal within the adaptive interval. Here, the quantization of the video signal usually takes 8 bits, and therefore K is 128.

In the present embodiment, the block adaptive factors is obtained using not the above equation but the look-up table of Fig. 6. In order to obtain the adaptive factor, the first adaptive modulation circuit 410 is constructed as shown in Fig. 5. The maximum value detector 411 detects the maximum value of the low band video signal within the adaptive interval, and the maximum value is used as an address of the block adaptive factor calculator 412 storing the look-up table of the adaptive factors as shown in Fig. 6A. Thereafter, the block adaptive factor calculator 412 outputs a 8 bit block adaptive factor corresponding to the input address and a first 3 bit index signal ID1 corresponding to the block adaptive factor from the look-up table as shown in Fig. 6A.

The block adaptive factor is applied simultaneously to one input of the selection circuit 417 and the adaptive factor interpolator 413. The interpolator 413 interpolates the input block adaptive

factor to provide the respective picture element adaptive factor. The subtractor 414 produces the difference signal between the block adaptive factor and the picture element adaptive factor, and difference signal is converted by the absolute value converter 415 into the absolute value that is applied to the comparator 416, at which the absolute value is compared with the reference signal TH. The reference signal LH is for selecting the picture element adaptive factor as the first adaptive factor f1 when the difference between the present block adaptive factor and the peripheral block adaptive factor is relatively greater or smaller. Thus, the comparator 416 generates the first selection signal for selecting the output of the interpolator 413 or second selection signal for selecting the block adaptive factor according to whether the output of the absolute value converter 415 is greater or smaller than the reference signal TH, respectively. The selection circuit 417 selects as the first adaptive factor f1 the picture element adaptive factor or the block adaptive factor according to whether the comparator 416 generates the first or second selection signal, respectively.

While the first adaptive modulation circuit 410 produces the first adaptive factor f1, the first delay circuit 420 delays the input low band video signal. Accordingly the first multiplier 430 multiplies the delayed low band video signal by the first adaptive factor f1 with amplification. Then the first non-linear converter 440 non-linearly converts the adaptively amplified low band video signal by using a non-linear function with the characteristics as shown in Fig. 2A, so as to amplify the picture elements of low level which are not previously amplified at the first adaptive converter 410.

Meanwhile, the high band video signal is applied simultaneously to the second adaptive modulation circuit 450 and the second delay circuit 460. Likewise the second adaptive modulation circuit 450 produces the second adaptive factor f2 to subject the high band video signal to the adaptive modulation, and produces the second index signal ID2 corresponding to the second adaptive factor f2. In this case, the maximum allowable value K is 32, and the high band video signal is processed with 6 bits considering the components of the

high band video signal are generally within the range of 0 to 63 [if there are given 32 off-sets, the range is -32 to 31]. The look-up table of Fig. 6B is used to find out the second adaptive factor f_2 . If the maximum value $|h_{max}|$ exceeds 6 bits within the adaptive interval of the high band video signal component input as an address, the adaptive factor is made to have $1/2$ and $1/4$ so as to suppress the amplitude.

Thus, in the second adaptive modulation circuit 450, the maximum value detector 411 detects the maximum value of the signal within the adaptive interval. The maximum value is applied as an address to the block adaptive factor calculator 412 to produce the block adaptive factor of the high band video signal and the second index signal ID2 of 3 bits corresponding thereto, thus transmitting to the channel. As stated above, the picture element adaptive factor is obtained from the high band block adaptive factor, and thereafter according to the states of adaptive factor of the peripheral block is selected the block adaptive factor or the picture element adaptive factor as the second adaptive factor f_2 .

Meanwhile, the second delay circuit 460 delays the input high band video signal during the second adaptive factor f_2 being produced by the second adaptive modulation circuit 450. The second multiplier 470 multiplies the delayed high band video signal by the second adaptive factor f_2 with amplification. The second non-linear converter 480 non-linearly converts the adaptively amplified high band video signal in conformity with 6 bits transmission by using the non-linear function of the characteristics as shown in Fig. 2B, thus amplifying the picture elements of low level which are not previously amplified in the second adaptive modulation circuit 450. The amplified picture elements are transferred to the channel.

There may be various methods whereby the adaptive factor interpolator 413 of the first and second adaptive modulation circuits 410 and 450 interpolates the block adaptive factor. If the block video signal has the picture element size of 4×3 as shown in the following Table 1, the picture element adaptive factors are obtained

from the present block adaptive factor and the upper, lower, right and left block adaptive factors with respect to the present block adaptive factor with imposing weight according to the positional relationship of each picture element.

5

TABLE 1

10

a11	a12	a13	a14
a21	a22	a23	a24
a31	a32	a33	a34

15

$$a11 = 1/2F + 1/4F + 1/4F$$

$$a12 = 1/2F + 3/8F + 1/8F$$

$$a13 = 1/2F + 3/8F + 1/8F$$

$$a14 = 1/2F + 1/4F + 1/4F$$

$$a21 = 1/2F + 1/2F$$

20

$$a22 = a23 = 1/2F + 1/8F + F + F + F$$

$$a24 = 1/2F + 1/2F$$

$$a31 = 1/2F + 1/4F + 1/4F$$

$$a32 = 1/2F + 3/8F + 1/8F$$

$$a33 = 1/2F + 3/8F + 1/8F$$

25

$$a34 = 1/2F + 1/4F + 1/4F$$

The adaptive modulated high and low band video signals together with the first and second index signals ID1 and ID2 are transmitted to the receiver, and processed in reverse mode of the transmitter so as to recover the original high and low band video signals.

The adaptive modulated low band video signal is applied via the channel to the first reverse non-linear converter 510, and the first index signal ID1 is applied to the first adaptive demodulation circuit 520. The first reverse non-linear converter 510 clips the portions of the low band video signal below a given level through coring process whereby the clipped portions of the low band video signal are taken as zero (0), and performs the non-linear reverse conversion of the video signal by using the conversion function of the characteristics reverse to that of the non-linear function as shown in Fig. 2A so as to chiefly eliminate the additive noises contained in the signal portion of low amplitude.

The block adaptive factor converter 521 of the first adaptive

demodulation circuit 520 receives the first index signal ID1 to produce the block adaptive factor. In this case, the block adaptive factor converter 521 has the block adaptive factor table of the low band video signal as shown in Fig. 6A, and produces the block adaptive factor corresponding to the first index signal ID1. The block adaptive factor is applied simultaneously to the selection circuit 526 and the adaptive factor interpolator 522 to produce the respective picture element adaptive factor. Thus, the first adaptive demodulation circuit 520 selects as the first adaptive factor f1 the picture element adaptive factor or the block adaptive factor according to whether the difference between the present block adaptive factor and the peripheral block adaptive factor. The first divider 530 divides the low band video signal of the first reverse non-linear converter 510 by the first adaptive factor f1 of the first adaptive demodulation circuit 520 so as to recover the original low band video signal.

The second reverse non-linear converter 540 clips the portions of the high band video signal below a given level through coring process whereby the portions of the low band video signal below a given level are taken as zero (0), and performs the non-linear reverse conversion of the video signal by using the conversion function of the characteristics reverse to that of the non-linear function as shown in Fig. 2B so as to chiefly eliminate the additive noises contained in the signal portion of low amplitude.

The second adaptive demodulation circuit 550 receives the second index signal ID2 to produce the corresponding second adaptive factor f2 in the same way that the first adaptive demodulation circuit 520 produces the first adaptive factor f1. In this case, the second adaptive factor f2 may be obtained by using the adaptive factor table as shown in Fig. 6B.

The second divider 560 divides the high band video signal of the second reverse non-linear converter 540 by the second adaptive factor f2 of the second adaptive demodulation circuit 550 so as to recover the original high band video signal.

Thus, the transmitter analyzes the adaptive factors of the present block and the peripheral blocks of the high and low band video signals so as to select as the final adaptive factor the block factor or the picture element factor, multiplies the original video
5 signal by the final adaptive factor, and subjects it to non-linear conversion. On the other hand, the receiver divides the adaptive modulated high and low band video signals by the block adaptive factor or picture element factor reversely with the transmitter, thus reducing the additive noises as well as eliminating the block effect.

10

Although the invention has been described with reference to the specific embodiment, this description is not meant to be construed in a limiting sense, as other embodiments of the invention will become apparent to person skilled in the art upon reference to the
15 foregoing description of the invention. It is therefore contemplated that the appended claims will cover any such modifications or embodiments as fall within the true scope of the invention.

WHAT IS CLAIMED IS:

1. A system for transmitting and receiving video signals compressed into frequency band blocks, comprising:

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an adaptive modulation circuit for receiving video signals of the frequency band blocks to produce a block adaptive factor and an index signal corresponding to said block adaptive factor, thereafter transmitting said index signal to a channel, for interpolating said
10 block adaptive factor so as to produce a picture element adaptive factor for each block, and for selecting either said block adaptive factor or picture element adaptive factor as a first adaptive factor according to the video signals of the peripheral blocks;

15 a delay circuit for delaying said video signals during said first adaptive factor being produced;

a multiplier for multiplying the video signal from said delay circuit by said first adaptive factor;

20

a non-linear converter for non-linearly converting the video signals from the said multiplier, transmitting to said channel;

a reverse non-linear converter for clipping the portions of the
25 adaptive modulated video signals below a given level, and for converting said adaptive modulated video signals non-linearly in a reverse mode with respect to said non-linear converter;

an adaptive demodulation circuit receiving said index signal for
30 converting said index signal into the corresponding block adaptive factor, interpolating said block adaptive factor to produce a picture element adaptive factor being equal to the picture element adaptive factor at adaptive modulation circuit, and for selectively provide as a second adaptive factor either said block adaptive factor or
35 picture element factor according to the video signals of said peripheral blocks; and

a divider for dividing the video signals from said reverse non-linear converter by said second adaptive factor of said adaptive demodulation circuit so as to recover the original block video signals.

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2. A system as claimed in Claim 1, wherein said adaptive modulation circuit comprises:

10 a maximum value detector for detecting the maximum value of the received video signal block;

15 a block adaptive factor calculator for producing said block adaptive factor corresponding to said maximum value of said maximum value detector and producing said index signal corresponding to said block adaptive factor;

an interpolator for interpolating said block adaptive factor so as to produce said picture element adaptive factor;

20 a subtractor for producing the difference signal between said block adaptive factor and picture element adaptive factor;

25 a comparator comparing said difference signal with a given reference signal, so as to provide selectively a first and second select signal when said difference signal is greater and less than said reference signal, respectively; and

30 a selection circuit for selectively selecting said picture element adaptive factor and block adaptive factor when the output of said comparator is the first select signal for selecting an output of the interpolator and second select signal for selecting said block adaptive factor, respectively.

35 3. A system as claimed in Claim 2, wherein said adaptive demodulation circuit comprises:

a block adaptive factor converter for receiving said index

signal from said channel to produce the corresponding block adaptive factor;

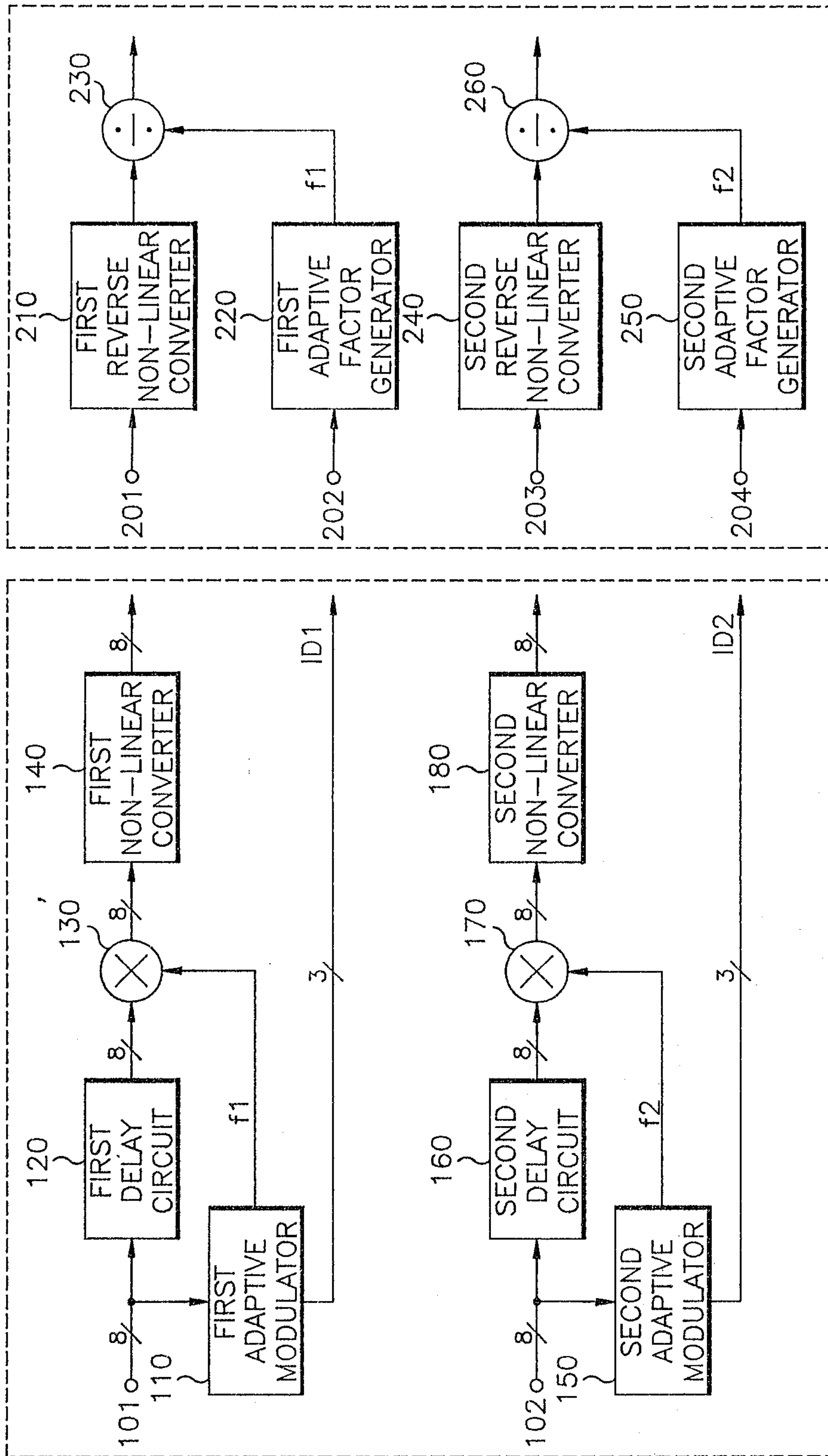
an interpolator for interpolating said block adaptive factor so as to said picture element adaptive factor;

an subtractor for producing the difference signal between said block adaptive factor and picture element adaptive factor;

a comparator comparing said difference signal with a given reference signal so as to provide the first and second select signal when said difference signal is greater and less than said reference signal, respectively; and

a selection circuit for selectively selecting said picture element adaptive factor and block adaptive factor when the output of said comparator is the first select signal and second select signal, respectively.

R. WILLIAM WRAY & ASSOCIATES
BOX 2760 - STATION D
OTTAWA, CANADA K1P 5W8
PATENT AGENT FOR THE APPLICANT



(PRIOR ART)
FIG. 1

2/6

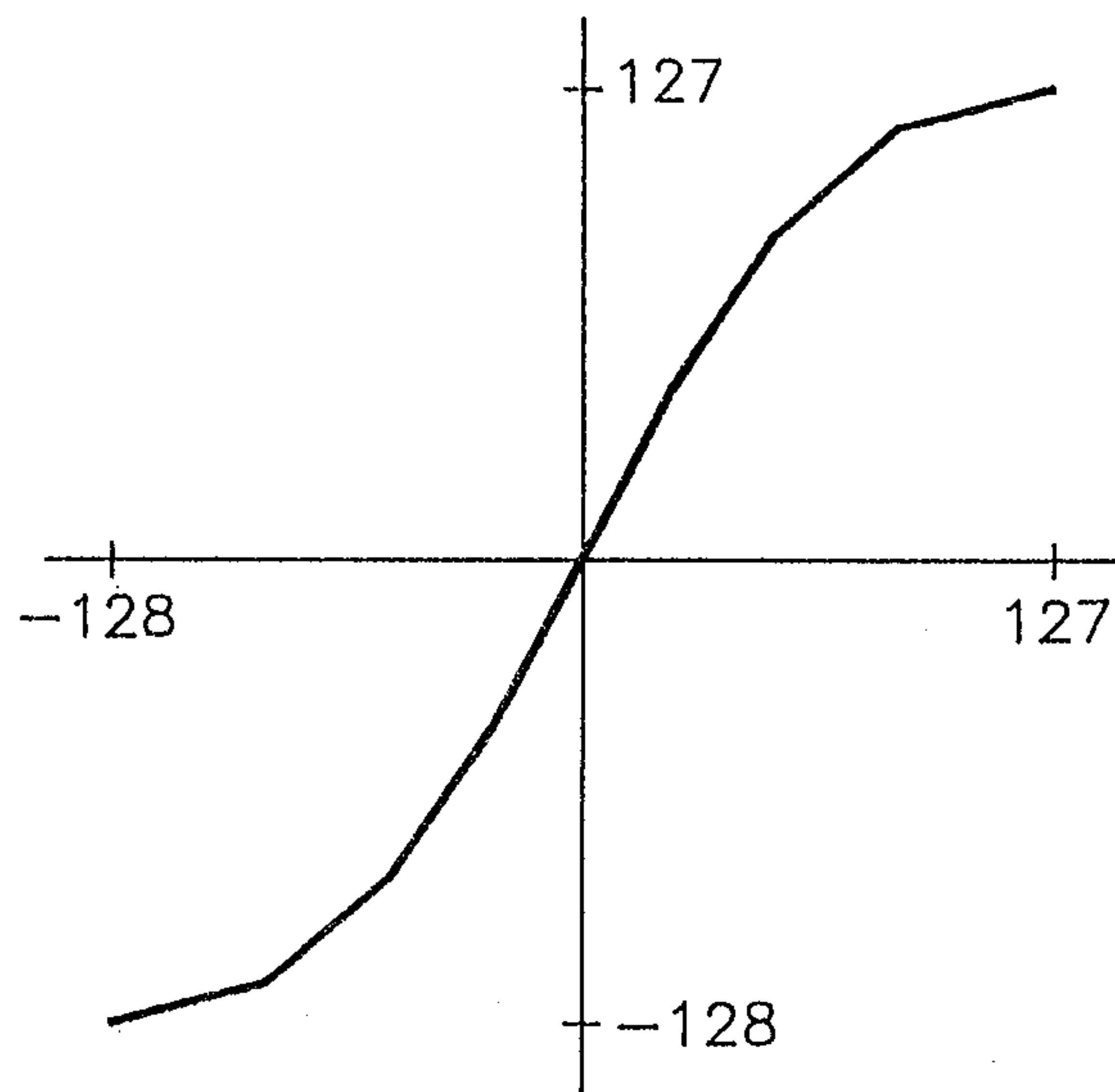


FIG. 2A

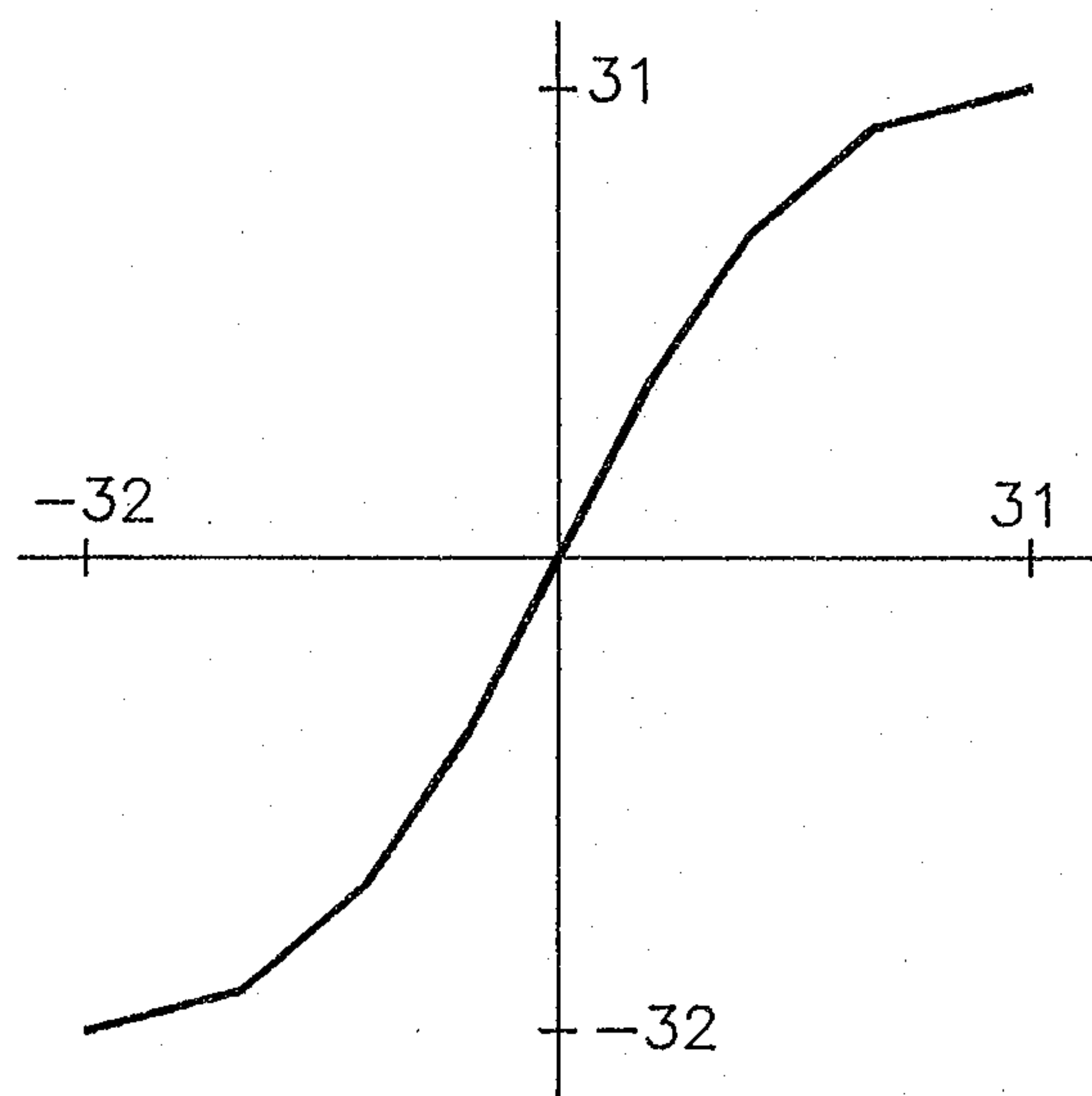
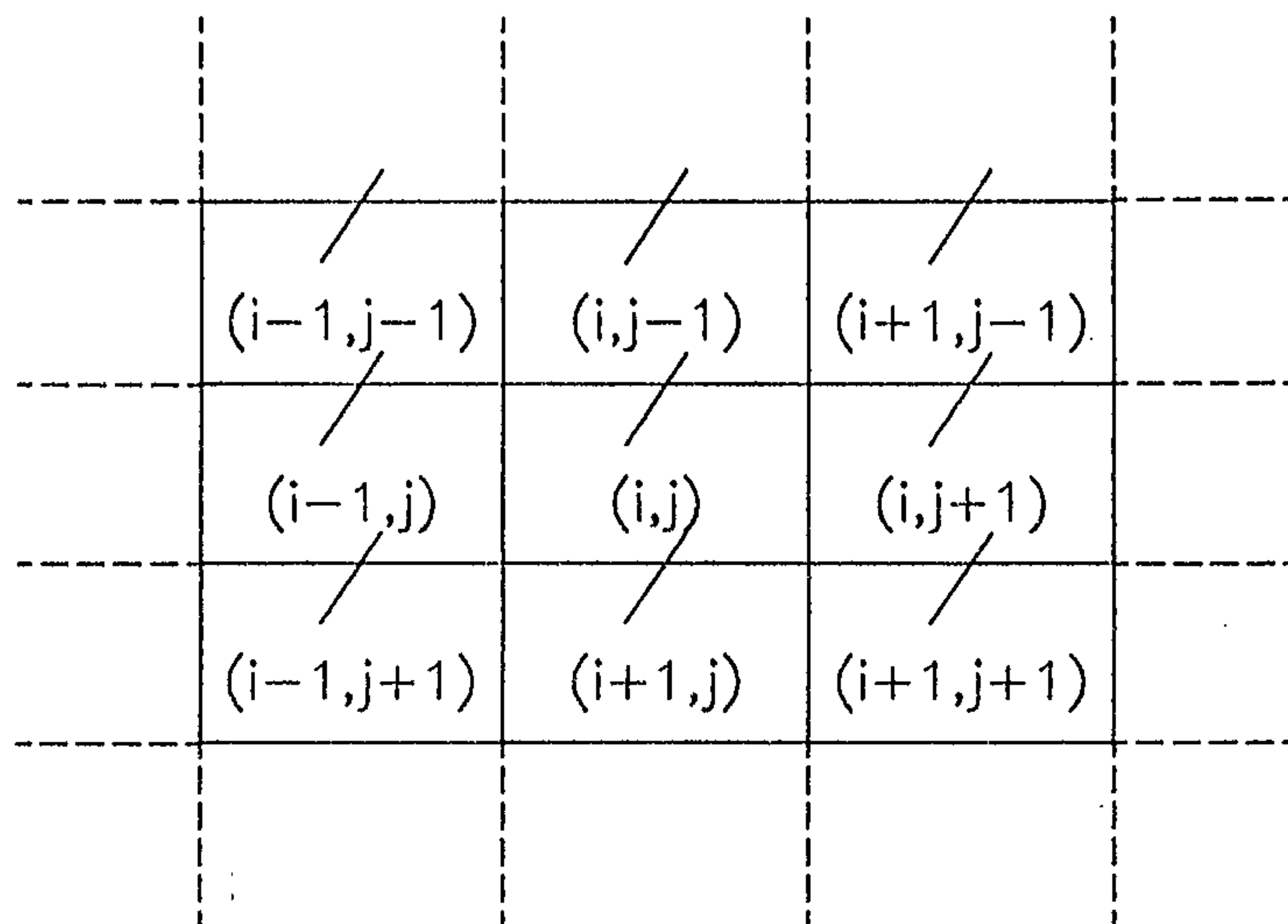
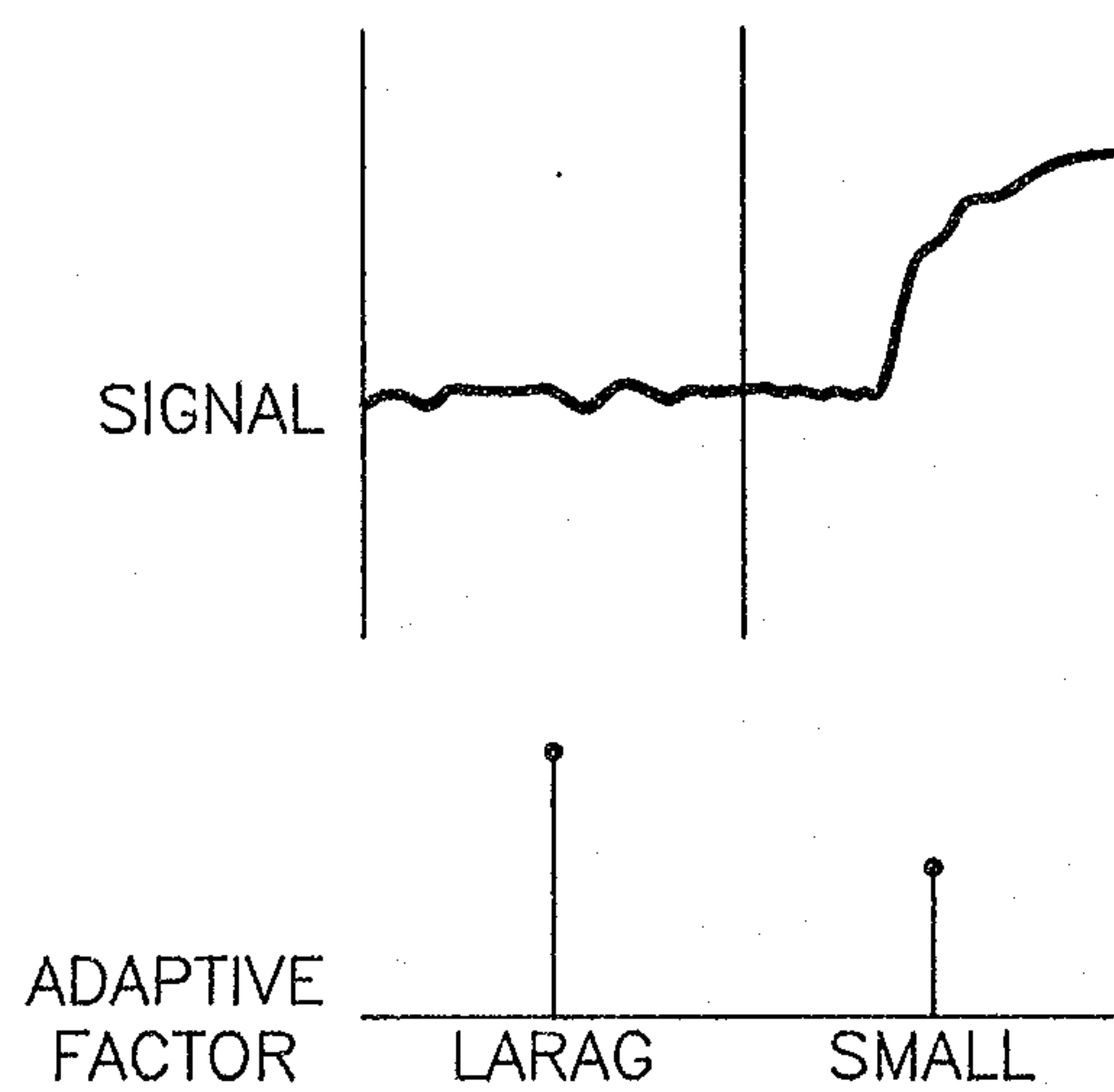


FIG. 2B

R. William Wray & Associates

*FIG. 3A**FIG. 3B*

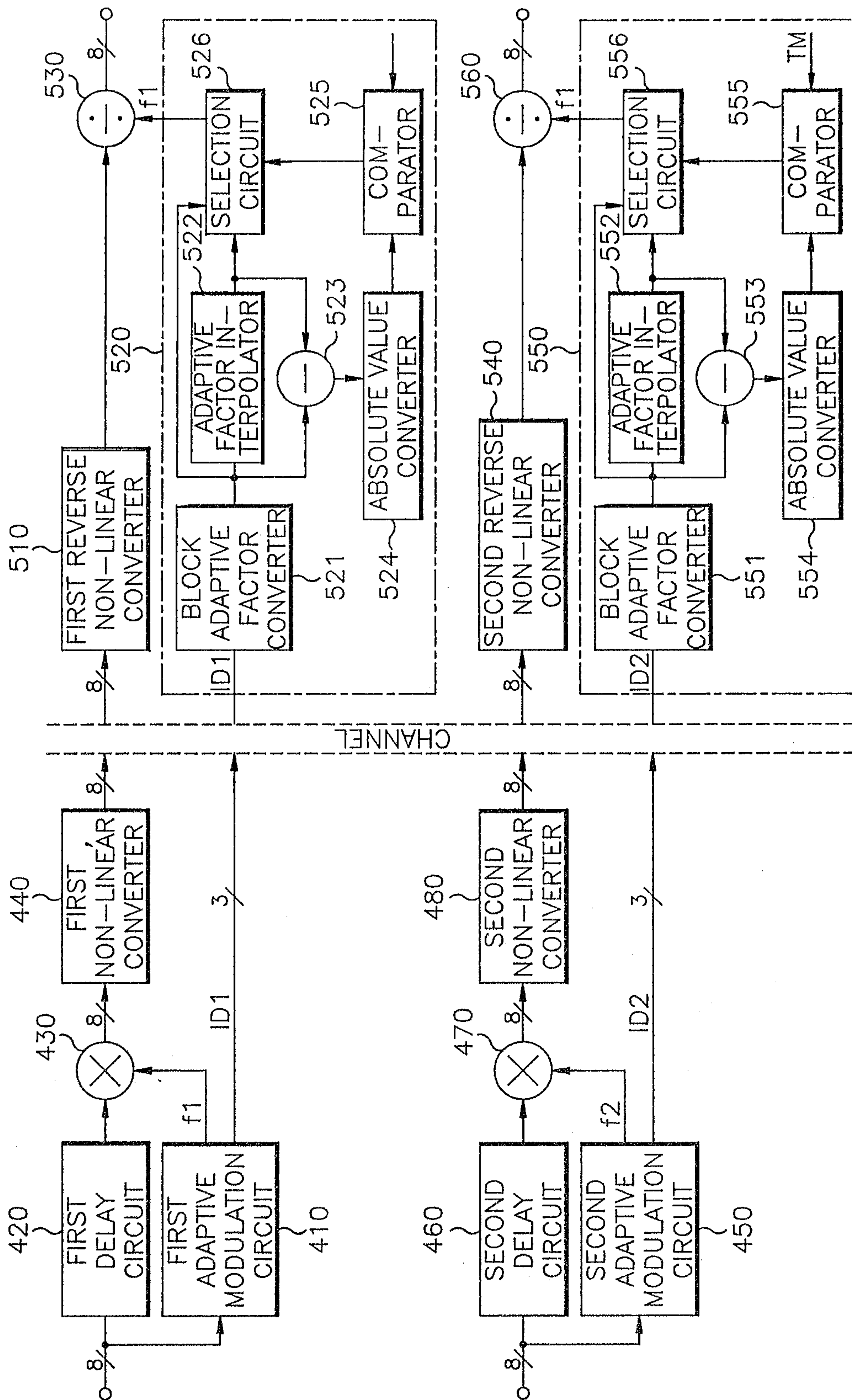


FIG. 4

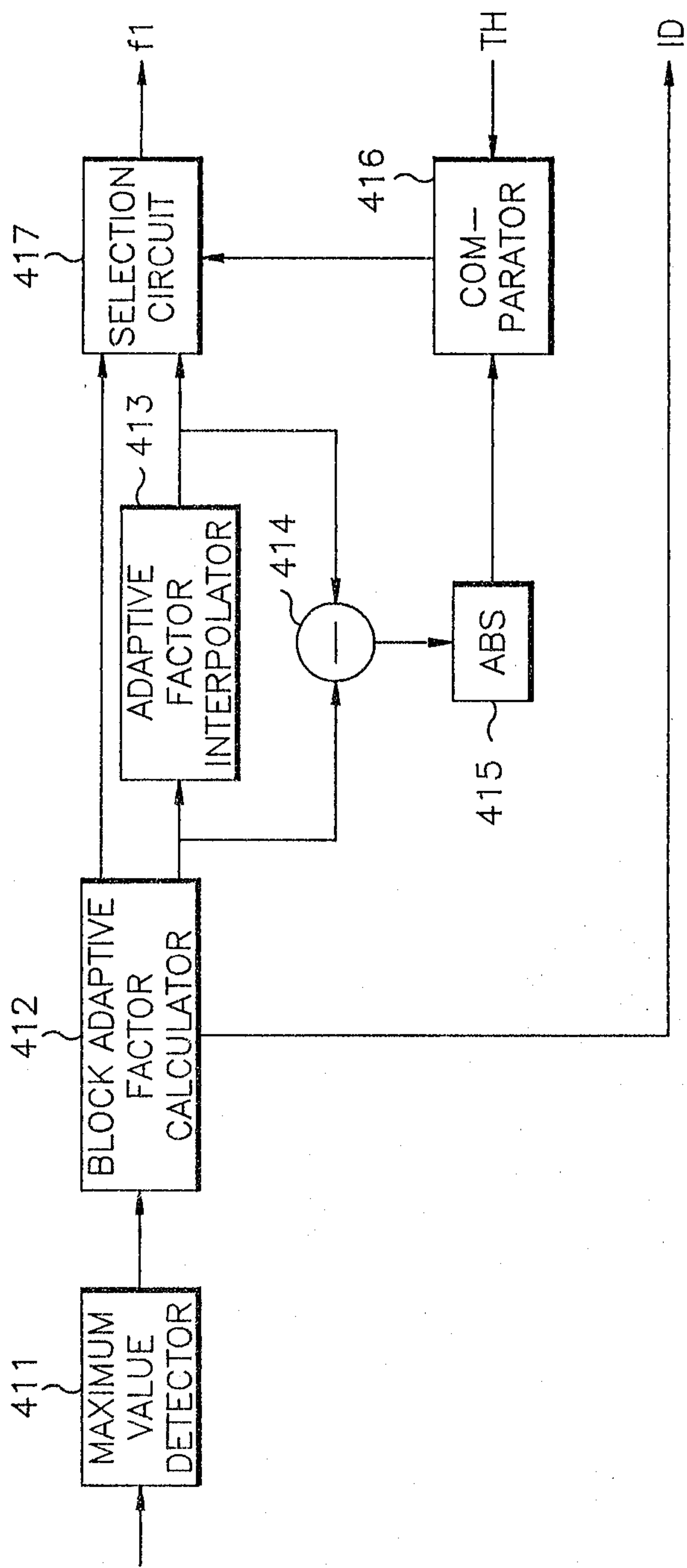


FIG. 5

6/6

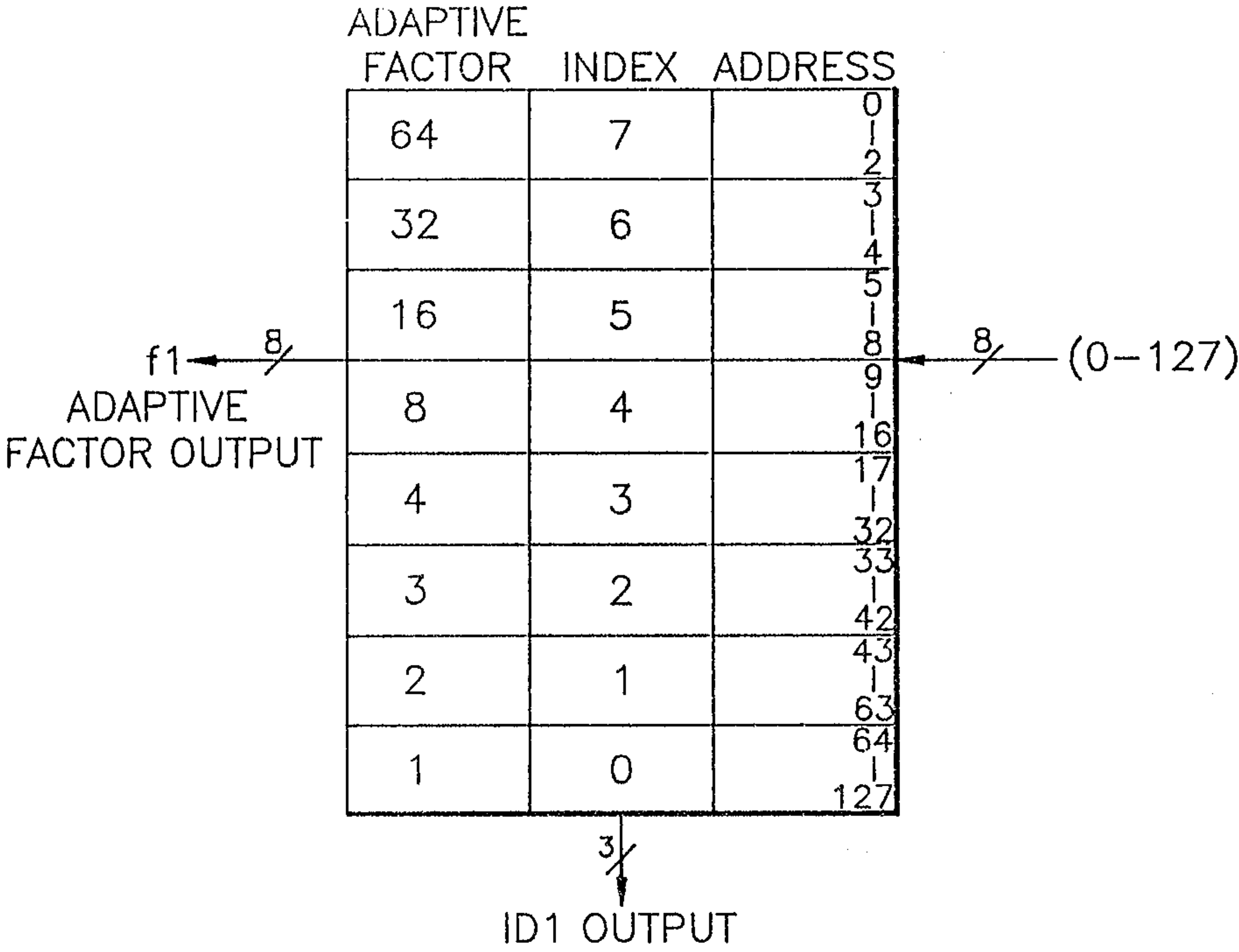


FIG. 6A

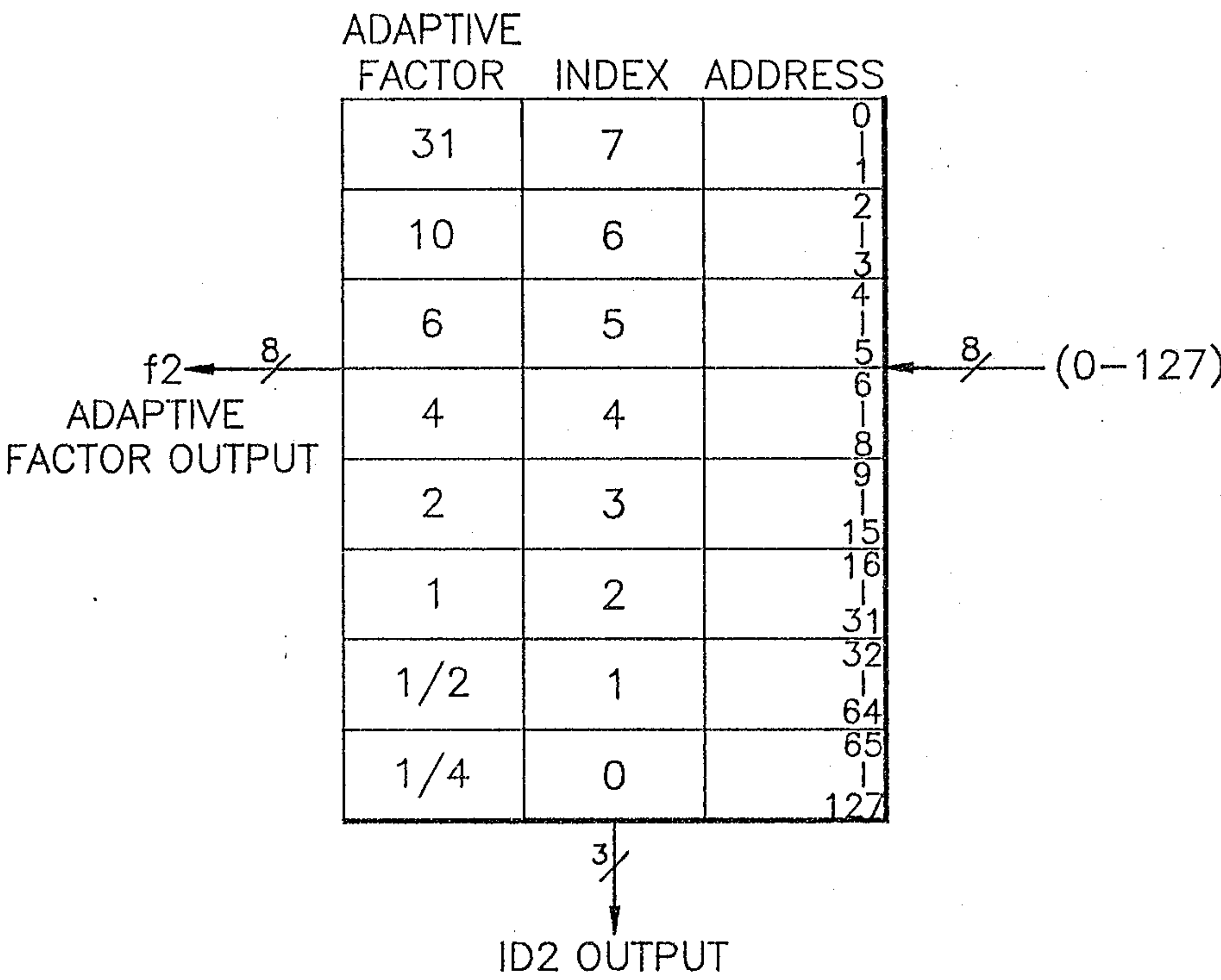


FIG. 6B