

### 3.4.3 Deduction processing

This processing is used to remove the strip reflected waves located at the deep area of 20cm and more on the scan result after a scan as shown in Figure 3-16. Perform the following steps to use this processing.

- (1) Press the **[6] PRCS** key.

The setting field of the **PROC** at the bottom line of the scan screen is video-inverted. Then the image processing mode starts.

- (2) Set **SUB** to the **PROC** by pressing the cursor keys **▲▼**.
- (3) Move the cursor to the area not showing any detected objects by pressing the cursor keys **◀▶**.  
(Refer to Figure 3-16 A (1).)
- (4) Press the **[5] ENTER** key. Then the deduction processing is performed by using the reflected wave at the cursor position. The marker **↓** is displayed at the cursor position in the distance gauge. (Refer to Figure 3-16 B.)
- (5) To exit from the image processing mode, press the **[6] PRCS** key again.

The setting field of the **PROC** changes to normal display. Then the image processing mode finishes.

#### Remarks

- When **SUB** (Deduction) is set with the cursor keys **▲▼** after manual surface wave processing (including real-time manual deduction processing) and deduction processing, the image generated through deduction processing using the reflected wave of cursor position (indicated by **↓**) of the last executed processing is displayed. (Deduction processing can be newly performed by moving the cursor and pressing the **[5] ENTER** key.)  
→ See Section 3.2.5 Real time manual deduction processing regarding the real time manual deduction processing.
- If manual surface wave processing and deduction processing (including real time manual deduction processing) after scanning are not performed, the image does not change when the cursor keys **▲▼** are used to set operation to **SUB** (deduction). (Deduction processing can be performed by moving the cursor and pressing the **[5] ENTER** key.)
- To perform deduction processing again, repeat steps (3) and (4).
- Manual surface wave processing and deduction processing are almost the same but have a different processing range.
  - Manual surface wave processing: area where the effect of surfaces waves is high
  - Deduction processing: full search depthDeduction processing may eliminate reflected waves such as waves reflected by the rear surface of a concrete wall.  
→ For details, see Section 3.4.1 Fixed surface wave processing.
- When the real-time manual deduction processing is selected for the cursor line containing the reflection wave from the targeted object (ex:rebar), this image processing has possibility of producing unwanted noise on the display by the influence of this reflection wave signal from the object.

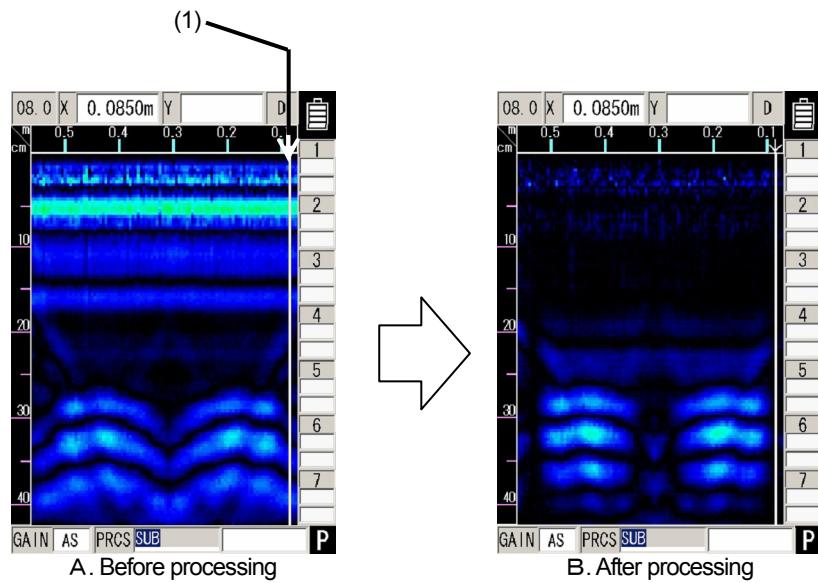


Figure 3-16 Deduction processing

### 3.4.4 Manual surface wave processing

Manual surface wave processing is used when the effect of reflection near the concrete surface on the scan result can not be completely removed. (See Figure 3-17 A.)

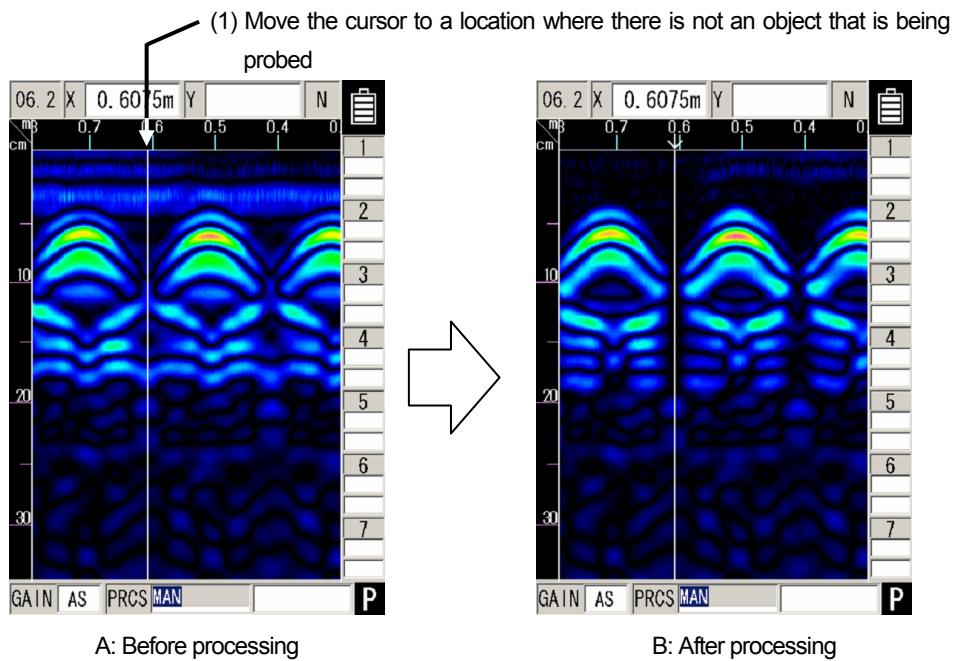


Figure 3-17 Display before/after Manual Surface Wave Processing

The operation is performed as described below.

- (1) Press the **[6] PRCS** key .  
The inverted display is shown as the item for the **PROC** setting at the bottom of the screen and operation switches to image processing.
- (2) Set **[MAN]** (Manual) using the cursor keys **▲▼**.
- (3) Use the cursor keys **◀▶** to move the cursor to a location where there is not a object to be probed in the scan results. (See Figure 3-17 A)
- (4) Press the **[5] ENTER** key. Manual surface wave processing will be performed while the reflected wave at the cursor position is used as the surface wave. At this time, the marker **↓** is displayed at the previous cursor position. (See Figure 3-17 B.)
- (5) To end the image processing mode, press the **[6] PRCS** key again.  
The normal display is shown as the item for the **PROC** setting at the bottom of the screen and image processing mode is exited.

Remarks

- When **[MAN]** (Manual) is set with the cursor keys **▲▼** after manual surface wave processing (including real-time manual deduction processing) and deduction processing, image data will be displayed using manual surface wave processing that uses the surface wave at the cursor position (indicated by **↓** ) of the last-executed processing. (Manual surface wave processing can be newly performed by moving the cursor and pressing the **[5] ENTER** key.)  
→ See Section 3.2.5 Real time manual deduction processing regarding the real time manual deduction processing.
- If manual surface wave processing and deduction processing (including real time manual surface wave processing) after scanning are not performed, the image does not change when the cursor keys **▲▼** are used to set operation to **[MAN]** (manual).  
(Manual surface wave processing can be performed by moving the cursor and pressing the **[5] ENTER** key.)
- To perform manual surface wave processing again, repeat steps (3) and (4).
- Manual surface wave processing and deduction processing are almost the same but have a different depth processing range.
  - Manual surface wave processing: area where the effect of surfaces waves is high
  - Deduction processing: full search depth  
→ See Section 3.4.5 Deduction processing regarding the deduction processing.
- When the real-time manual deduction processing is selected for the cursor line containing the reflection wave from the targeted object (ex:rebar), this image processing has possibility of producing unwanted noise on the display by the influence of this reflection wave signal from the object.

### 3.4.5 Average wave processing

This image processing calculates the average reflected wave of the entire A-mode data in the scan results, subtracts the calculated average wave from each A-mode data, and displays the processed data. The average processing is effective to remove the constant horizontal strip noise appearing in the scan result. (This processing removes the constant signal existing at the same depth like the reflected wave from the far side of the wall. Consider this point in using this processing.) Perform the following steps to use this processing.

- (1) Press the **[6] PRCS** key.

The setting field of the **PROC** setting at the bottom line of the scan screen is video-inverted. Then the image processing mode starts.

- (2) Set **AVG** to the **PROC** by pressing the cursor keys **▲▼**.

- (3) To exit from the image processing mode, press the **[6] PRCS** key again.

The setting field of the **PROC** setting changes to the normal display. Then the image processing mode finishes.

#### Notes

- The average processing removes the constant horizontal strip noise and signal. Therefore it removes also the constant signal actually reflected from the object at the constant depth.

### 3.4.6 Peak processing

Peak processing deletes multiple reflected waves of surface wave processing results and displays only the reflected waves from objects being probed (rebar etc.). Use this when it is difficult to see the depth of the objects being probed due to multiple reflected waves.

Note that peak processing cannot be used for probing objects (e.g., cavities) that have a lower relative permittivity than concrete.

Peak processing can be performed for the results of fixed surface wave processing (including real-time automatic surface wave processing), manual surface wave processing (including real-time manual surface wave processing), and deduction processing.

Procedure for reduction processing:

- (1) Press the **[6] PRCS** key.

The inverted display is shown as the item for the **PROC** setting at the bottom of the screen and operation switches to image processing.

- (2) Set **PEAK** using the cursor keys **▲▼**.

- (3) Set **PEAK** 's second field to one fo **MAN**, **AVR**, **INT**, or **SUB** by using the cursor keys **◀▶**. The peak processing is be performed for the relevant process results.

(4) To end the image processing mode, press the **6 PRCS** key again.

The normal display is shown as the item for the **PROC** setting at the bottom of the screen and image processing mode is exited.

Figure 3-18 shows sample display when peak processing is performed for the result of manual surface wave processing.

Remarks

- The display items at the bottom of the screen and their meanings are as follows:
  - Peak manual: Peak processing for the result of manual surface wave processing
  - Peak fixed: Peak processing for the result of fixed surface wave processing
  - Peak deduction: Peak processing for the result of deduction processing
- If **PEAK MAN** (peak manual) or **PEAK SUB** (peak deduction) is set without manual surface wave processing or deduction processing being performed after scanning, the same data as when **PEAK INT** (peak fixed) is set will be displayed.
- If reflected waves shaped as horizontal stripes appear near the surface of concrete after scanning (with automatic real-time surface wave processing performed), the setting of **PEAK INT** (peak fixed) may cause waves reflected by the reinforcing steel bars to be invisible due to the remaining horizontal stripes. In this case, use the following method (1) or (2) to solve the problem:
  - (1) Perform manual surface wave processing for scan results to eliminate the reflected horizontal stripe waves from the data, and then perform the peak manual.
  - (2) Perform deduction processing for scan results to eliminate reflected horizontal stripe waves from the data, and then perform the peak deduction.

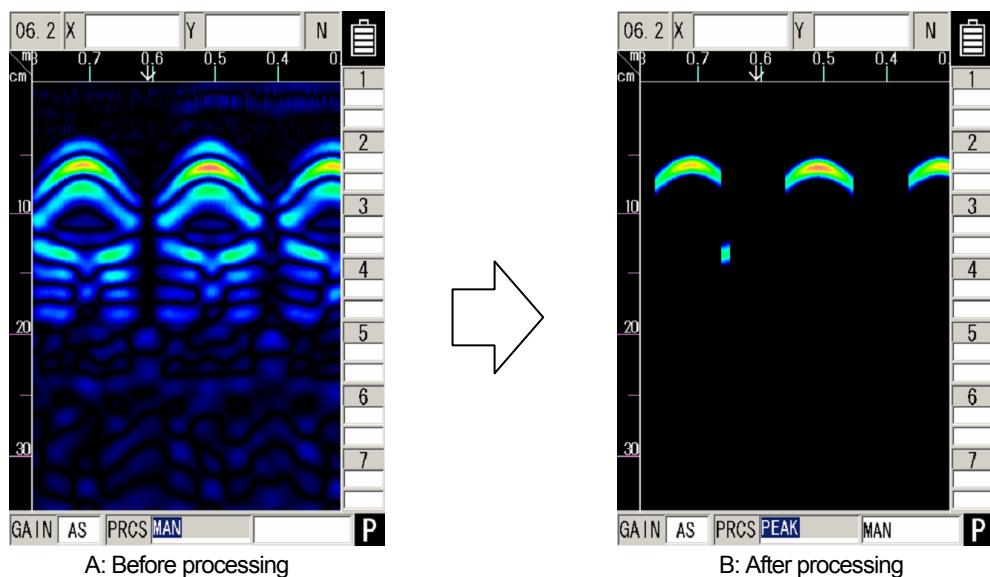


Figure 3-18 Peak processing