

# Recycling-type Fund Receiving and Disbursing Management System USCOS (Universal Service & Cash Order System)

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In response to the changing lifestyles and needs of customers, improvements to the sales operations at stores are being promoted in the retail industry. Amidst such efforts increasing costs relating to the handling of cash are becoming an issue as cash funds continue to be handled in this industry while fewer night deposit services are provided by financial institutions and the provision of change is being charged. Furthermore, improving the efficiency and reducing the cost of cash handling operations, such as the processing of sales proceeds and the preparation of funds for change are becoming pressing issues for cash management operations.

The recycling-type fund receiving and disbursing management system, USCOS, realizes fund disbursement and change functions through the recycling of cash, which is not available with conventional fund receiving units used by the retail stores. The features of USCOS, the first receiving and disbursing process in the industry to sort out received cash into change preparation funds and sales proceeds, described in this paper, are designed to improve functions over those of conventional fund receiving units while maintaining a consideration for the cash management systems at the retail stores.

## Features of USCOS

Retail stores (such as supermarkets and department stores) perform their cash management operations in the manner described below, placing an extremely large burden of responsibility on those persons designated as persons in charge of managing cash funds.

- Tasks relating to the preparation of funds for change:
  - Tasks relating to the removal of cash from the safe by the person in charge of cash management.
  - Tasks relating to the allocation of cash funds by the person in charge of cash management (for each cash register, etc.).
- Tasks relating to the processing of the sales proceeds:
  - Tasks relating to the sorting of the sales proceeds and change preparation funds from all cash funds drawn from cash registers.
  - Tasks relating to the transfer of funds to and from night deposit or fund collection and distribution services.

Furthermore, unlike conventional fund receiving units or ATMs, USCOS features a function for receiving cash funds and sorting them into sales proceeds and change



Photo 1 External view of USCOS

preparation funds. The cash management of the sales proceeds and change in stores is performed, thereby reducing cash handling operations and achieving efficient operations for the funds handled at stores.

An external view of USCOS is shown in **Photo 1**, whereas the main functions are described below.

- ① Large-capacity change preparation fund disbursement function.
- ② Recycling function.
- ③ Change function.
- ④ Funds receiving function that sorts change preparation funds and sales proceeds.

### ① Large-capacity change preparation fund disbursement function

Change preparation funds are required before cash register operations begin at supermarkets and customer service windows, where the exchange of cash is conducted with customers. The system provides a fund disbursement function for such change preparation funds. The amount and denomination of cash required by supermarkets varies depending on the day of the week, cash register and whether or not a sale is current. For this reason, the system is also equipped with a function for registering the quantity required for each denomination. Operators are able to select fund disbursement patterns, pre-registered with the system, to easily prepare the necessary funds for change.

② Recycling function

Funds drawn from cash registers and customer service windows are deposited into USCOS and the cash funds received are sorted as change preparation funds and sales proceeds. The cash funds sorted as change preparation funds can be recycled as change preparation funds and disbursed as such, while the sales proceeds can be deposited into a collection safe, thereby realizing a cash recycling function for efficiently operating and collecting the cash funds received.

③ Change function

A changing function for breaking down higher denominations into lower denominations (example: from JY10,000 bank notes into one JY5,000 and four JY1,000 bank notes and two JY500 coins) as well as a reverse changing function for changing lower denominations into higher denominations (example: 50 JY100 coins into a single JY5,000 bank note) has been realized.

④ Funds receiving function that sorts change preparation funds and sales proceeds

Conventional fund receiving units can sort the received funds into individual denominations, or store all funds in a single storage section. For this reason not only are the sales proceeds consigned to the cash funds center (transfer agents for depositing funds to financial institutions) but the change preparation funds are also consigned to them and they will return the change preparation funds on a later date.

USCOS has a received fund sorting feature that sorts the received cash funds into sales proceeds and change preparation funds and then stores and manages all such funds.

USCOS manages the amount of funds (change preparation funds) disbursed to each applicable cash register or customer service window as well as sorts out the change preparation funds and sales proceeds from the cash funds received from them before storing the sorted funds. By first sorting out the change preparation funds and sales proceeds prior to storing the funds, it is

Table 1 Sorting process priorities

Order of priority	Descriptions
Priority 1	Denominations being stored that are above the "near full" amounts (set value representing a condition when the maximum storage capacity is about to be reached) are moved to sales proceeds.
Priority 2	Denominations not used as part of the change preparation funds (unrecyclable) are stored as sales proceeds.
Priority 3	Denominations being stored that are above the "near end" amounts (set value representing the condition where the minimum necessary amount) are stored as sales proceeds.
Priority 4	Deposited denominations that are stored to prevent transfers (inter-cassette transfers) between the change preparation funds storage section and sales proceeds collection safe.
Priority 5	Denominations of a high value are stored as sales proceeds.

possible to hand over only collection safes with particular proceeds to the cash fund center.

Optimizing recycling of change preparation funds

The process of sorting the received funds, which optimizes the recycling of change preparation funds, is described. Feeding routes for deposited cash funds are shown in Fig. 1.

(1) Order of priority for sorting process

The process of sorting deposited cash funds into change preparation funds and sales proceeds is based on the order of priority defined in Table 1.

Details of the definitions are described below.

• Priority 1

Denominations necessary as change preparation funds are JY1,000 and JY5,000 bank notes and coins (JY500, JY100, JY50, JY10, JY5 and JY1). Denominations for which the amount derived by the "current balance (balance before storage operations) plus the currently received amount (amount deposited for

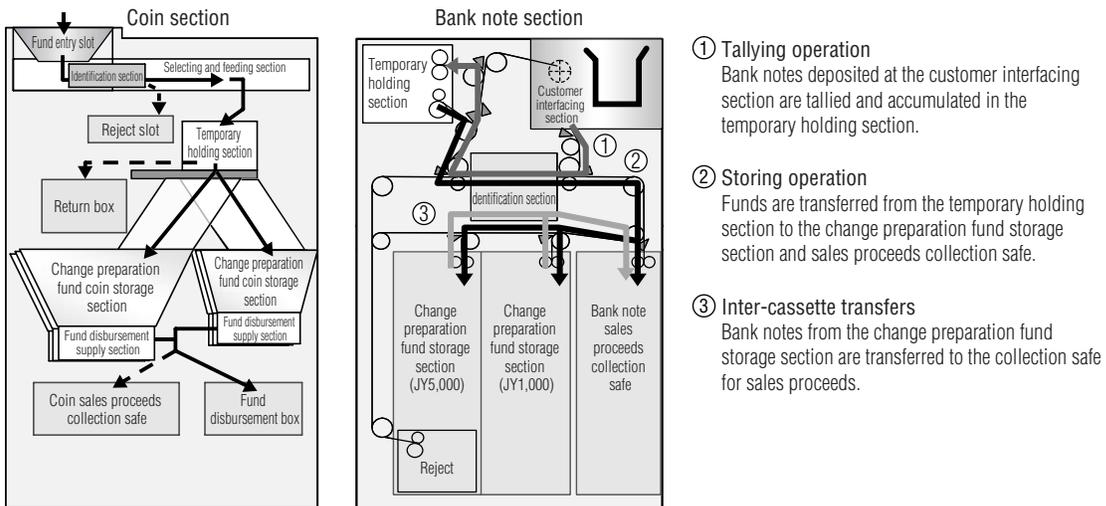


Fig. 1 Cash fund feeding routes

- ① Tallying operation  
Bank notes deposited at the customer interfacing section are tallied and accumulated in the temporary holding section.
- ② Storing operation  
Funds are transferred from the temporary holding section to the change preparation fund storage section and sales proceeds collection safe.
- ③ Inter-cassette transfers  
Bank notes from the change preparation fund storage section are transferred to the collection safe for sales proceeds.

each denomination from the fund receiving transaction)" of the change preparation funds exceeding the near full amount, is considered to be the denomination for storing sales proceeds. The amount to be stored is determined within a range in which the applicable denomination exceeds the near full amount. When multiple denominations exceed the near full amounts, the selection of denominations for storing sales proceeds is determined by their order of proximity to the full amount. This is done in order to prevent fund receiving transactions from becoming unavailable due to full conditions for a given denomination.

• **Priority 2**

Since JY10,000 and JY2,000 bank notes are not used as change preparation funds (unrecyclable), these denominations, which do not fall under the category of Priority 1, are prioritized for storage as sales proceeds.

• **Priority 3**

Denominations that do not fall under the categories of Priority 1 or 2, that is, denominations in the amount of "current balance plus the current deposit amount" of the change preparation funds, which exceed the near end amount, are prioritized as denominations subject to storing as sales proceeds.

• **Priority 4**

When a denomination does not fall under any categories from Priority 1 to 3 and if the amount of cash funds deposited in the USCOS alone suffices as sales proceeds for storage, then the deposited cash funds are processed as sales proceeds. For example, if the amount of cash deposited in the USCOS is ten JY1,000 bank notes and two JY5,000 bank notes, whereas the sales proceeds are JY15,000, then two JY5,000 bank notes and five JY1,000 bank notes are stored in the collection safe as sales proceeds, while the remaining five JY1,000 bank notes are processed for storage as change preparation funds in the safe for change preparation funds.

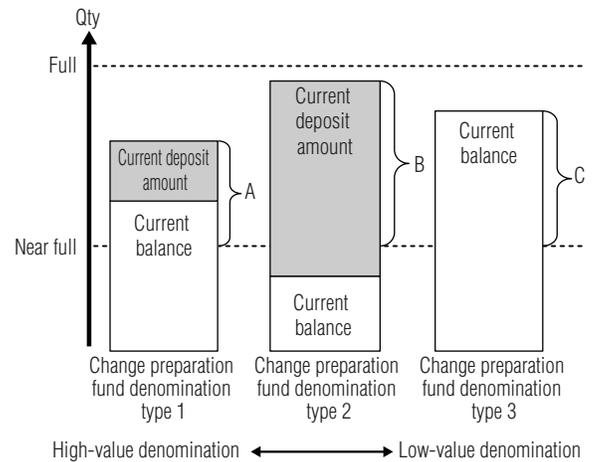
• **Priority 5**

When a denomination does not fall under any categories from Priority 1 to 4, then denominations starting from the highest value, are processed as sales proceeds for storage. For example, if the cash funds of a single JY10,000 bank note are deposited in the USCOS and if the sales proceeds are JY6,000, then the JY10,000 bank note is stored in the change preparation fund storage section (reject section) and one JY5,000 as well as one JY1,000 bank note are transferred from the change preparation fund storage section to the collection safe for sales proceeds. This process is called inter-cassette transfer.

**(2) Processing when multiple near full denominations occur**

A description has already been provided for prioritizing a denomination with which a near full amount has been reached for processing as Priority 1 in order to store the funds in the sales proceeds safe and a description is provided here for the processing of near full amounts that are reached with multiple denominations.

**Fig. 2** is a conceptual representation of an example showing the status of funds accumulated when all



**Fig. 2 Example of near full occurrences**

deposited cash funds are stored in the change preparation fund storage section. It shows that there are multiple types of denominations that have exceeded the near full status.

When deposited cash funds are sorted into those for change preparation funds and those for sales proceeds, a determination on the sorting process is performed by first assuming that all deposited cash funds are stored as change preparation funds to see whether any of the denominations exceed their near full amounts.

The example in **Fig. 2**, shows that denomination types 1 and 3 of the change preparation funds already have a current balance before the current deposit that exceeds the near full amount, whereas denomination type 2 of the change preparation funds will exceed the near full amount once the current deposit is made.

In such cases the amount transferred to the collection safe for the sales proceeds is determined starting from the denomination with amounts that are closest to the full amount. This means that the amount transferred to the sales proceeds storage is determined from B of the change preparation funds denomination type 2.

When the amount transferred from B of the change preparation funds denomination type 2 alone is not enough to constitute the amount of sales proceeds, then the amount for transfer to the sales proceeds storage is determined from the denomination that is next closest to the full amount. This means that the amount transferred to the sales proceeds storage is determined from C of the change preparation funds denomination type 3. If this is still not enough, then the amount transferred to the sales proceeds storage is determined from the change preparation funds denomination type 1.

By performing the storage process in the manner described above, it is possible to efficiently recycle the change preparation funds.

**Anticipated impact from implementation of USCOS**

Through the implementation of USCOS a reduction in expenses relating to change preparation funds is promoted, cash management for each individual

personnel assigned to cash registers is achieved, while stricter cash management becomes possible.

### **(1) Problems relating to current cash funds management operations**

Multiple personnel are assigned to the same cash register throughout the course of operations during the day. When the switching of personnel takes place the cash funds in the cash register, handled by the previous personnel, are taken to the funds receiving unit in the back office, where the cash funds are either manually sorted into change preparation funds and the sales proceeds deposited into fund receiving units, or the entire amount is deposited into the fund receiving unit without first sorting it into change preparation funds and sales proceeds.

In the case of the former procedure, there is the burden of a sorting operation for the manager as well as the person in charge of such tasks, whereas for the latter procedure, because the funds are stored without being sorted into change preparation funds and sales proceeds first, the entire amount, including change preparation funds is first consigned to the cash fund center, resulting in the problem of needing to make a separate set of change preparation funds available at the store, which in turn causes a rise in the costs relating to replenishing funds for change.

### **(2) Improvement effects on cash fund management operations due to USCOS**

Problems relating to the current cash fund management can be resolved using USCOS.

#### **① Sorting of deposited cash funds into change preparation funds and sales proceeds becomes unnecessary**

Since USCOS features a function that automatically sorts the deposited cash funds into change preparation funds and sales proceeds, there is no need for assigned personnel or a manager to conduct any operations to sort the funds before depositing them.

#### **② Excessive management costs relating to change preparation funds can be eliminated, since only sales proceeds are consigned to cash fund centers**

Since USCOS is able to store the change preparation funds and sales proceeds into separate storage sections, it is possible to consign only the sales proceeds to the cash fund centers. The change preparation funds stored in USCOS become available for recycling, eliminating the need for excessive amounts of change preparation funds.

The anticipated impact from implementing USCOS are summarized below:

- Reduced costs due to the recycling feature relating to change preparation funds  
(35% reduction has been verified through a store survey)

- Reduced labor and time relating to cash fund management  
(30% reduction in time per day has been verified through a store survey)

### **Operating status of USCOS**

Mass production shipments have been made since April of 2005. The status of implementation for USCOS as of April 2006 is shown below:

- **Direct sale users: Seven users**  
Supermarkets and department stores.
- **Indirect sale users: Two users (end users: six users)**  
Supermarkets, department stores and book stores via security companies.  
Number of units in operation: 50 units.

Other than the above we have also received numerous inquiries for sales negotiations from a diverse range of businesses and for numerous applications, indicating high expectations for USCOS.

### **Conclusion**

The development of USCOS made it possible for Oki Electric to succeed in entering the cash fund management market for retail stores and we are hopeful for future market expansion.

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