Infor Distribution A+ Radio Frequency Overview

Important Notices

Trademark Acknowledgements

Publication Information

Release: Infor Distribution A+ Radio Frequency Overview

Publication date: June, 2026

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Radio Frequency Overview

The Radio Frequency module is added to and fully integrated with Warehouse Management to provide the optimum means for receiving, moving and tracing inventory through its life cycle in your warehouses. Since Radio Frequency is an add-on module to Warehouse Management, you must install Warehouse Management before, or in conjunction with, Radio Frequency.

While bar coding is not required to use Radio Frequency, this documentation is written to provide bar code scanning and keying functionality for the most effective use of Radio Frequency functions. Descriptions will include terminology related to bar codes (such as, “scanning”) as well as terminology related to manual keying procedures.

Radio Frequency is geared towards creating a paperless warehouse management system by allowing performance of warehouse management tasks from remote locations (i.e., locations other than IBM i workstations). When you use a hand-held or vehicle-mounted radio receiver (referred to in this document as the “transaction manager”) and bar coding, you can read information and automatically enter it into the Distribution A+ database on the IBM i. Data is immediately available for display and inquiry when the transaction manager is used, and you will be able to perform verification and comparison functions with the available data.

System-Defined Tasks

System-defined tasks are mandatory for the successful operation of a warehouse. Radio Frequency provides timely, accurate, remote activity for the following system-defined tasks:

- Receiving
- Put-Away
- Moving Inventory
- Counting Inventory
- Shipping Inventory
- Picking Inventory

Receiving

The way you operate your business will impact how you specify a quantity when you create receivers. How you specify the quantity on the receiver will determine when you are warned that you are over-receiving during RF receiving.

If you want the quantity on the purchase order to determine when you will be warned of over-receiving, you would create the receiver for the full quantity of the item on the purchase order. During receiving this will allow you to use the receiver as many times as you want with no warnings until the quantity of items received equals or exceeds the quantity specified on the receiver (the full purchase order quantity).

If you want the quantity on the receiver to determine when you will be warned of over-receiving, you would create the receiver for the quantity that you actually expect to receive. This could be an amount that is less than the quantity on the purchase order. During receiving this will allow you to use the receiver as many times as you want with no warnings until the quantity of items received equals or exceeds the quantity specified on the receiver. At that point, when any additional receipts are entered for the item, you will be warned that the identified receiver amount is being exceeded.

In either of the above two cases, you may continue to enter receipts until such time that you post receipts that equal or exceed the quantity on the purchase order. As soon as you post a received quantity that equals or exceeds the quantity on the purchase order, that purchase order line item will be closed and you will not be allowed to receive against this purchase order number again for that line item.

In RF receiving, you can receive on a “blind receiver”, i.e., a receiver that does not previously exist. Since the receiver does not already exist, there is no previously identified receiver quantity to receive against. When receiving on a blind receiver you must still specify a purchase order. The quantity you first identify as being received on the blind receiver will become the default quantity for this line item. If the quantity received does not equal or exceed the quantity on the purchase order, you will be allowed to use this blind receiver again as many times as you want until you post a received quantity that equals or exceeds the quantity on the purchase order. Each time you use this blind receiver again, you will get a warning that you are over-receiving because the default quantity on this blind receiver is the quantity that you already received when you first received on it.

Radio Frequency receiving includes creating cross-references between an identification number, which can either be a Universal Product Code (UPC), vendor’s item number, and your own (“our”) item number. This task also creates and, if applicable, validates receivers to process items. If Radio Frequency options are setup accordingly, you can use the Auto Put-Away feature for receiving. This feature replicates the Pre-Receiving Location Selection Process in the Warehouse Management module.

When you use Radio Frequency to receive inventory, several features are available.

Verification of Handler IDs

This verification feature ensures that only those handlers with access to perform receiving tasks will be able to enter receiving data. This feature applies to all tasks, not just receiving.

Verification of Vehicle IDs

Where applicable, this verification feature ensures that vehicle use is appropriate, according to any access established. This feature applies to all tasks, not just receiving.

Remote Data Entry

This feature is available (with or without the use of bar coding) via the transaction manager. This feature applies to all tasks, not just receiving.

Verification of Purchase Order Numbers

This verification occurs immediately to ensure accuracy. As you scan in purchase order numbers they are verified as valid against the Distribution A+ database.

Note: If a received item is not on an open purchase order, it must be received as a miscellaneous receipt via Warehouse Management. Refer to the Warehouse Management User Guide for details about miscellaneous receipts.

Cross-Referencing

This feature allows you to link your (“our”) item number to another number (e.g., a manufacturer’s number or UPC symbol). This feature is available due to an interface between Radio Frequency and the Inventory Accounting module, which maintains the Item Master File. Authority to create cross-references is determined for each handler through Handlers Maintenance (MENU RFFILE). If you determine that a handler has the ability to create such a cross-reference, the following occurs when the number (UPC, manufacturer number, etc.) on the received item is encountered:

1. The Purchase Order Detail File is checked to see if a match is made between the entered number and the vendor/item number identified in the **Mfg No** field for the current purchase order. If a match is made, the file is checked to extract your (“our”) item number to make the connection.
2. If no match is made, the Vendor Item File is checked to see if a match is made between the entered number and the manufacturers’ number identified in the **Manufacturers No** field. If a match is made, the file is checked to extract your (“our”) item number to make a connection.
3. If no match or connection is made, the Item Master File is checked to see if a match is made between the entered number and the manufacturer number identified in the **Manufacturers No** field. If a match is made, the file is checked to extract your (“our”) item number to make the connection.
4. If no match or connection is made, the Universal Product Code Cross Reference File is checked to see if a match is made between the entered number and the bar coded item number identified in the **UPC Code** field. If a match is made, the file is checked to extract your (“our”) item number to make the connection.

5 If no match or connection is made, the Item Master File is checked to see if a match is made between the entered number and the item number identified in the Item No field. If a match is made, the file is checked to extract your (“our”) item number to make the connection.

6 If no match or connection is made, the **Alternate Item Number** field in the Item Cross-Reference File is checked to extract your (“our”) item number to make the connection.

7 If no match or connection is made and there is a chance that the entered number might be your own item number, the Item Master File is checked to see if a match is made between the entered number and the item number identified in the **Item No** field. This does not result in a connection, but instead serves as a validation of the item number.

8 If no match is made and the handler has the authority to create cross-references, a connecting cross-reference between the entered number and your own (“our”) item number can be made. Making the connection consists of copying the entered number and placing it into the **Manufacturers No** field in the Item Master File (if one has not already been specified) or in the Item Cross-Reference File (if the user chose to set up the new item as a non-UPC item number). If the user chose to set up the new item number as a UPC number, the connection consists of copying the entered number and placing it into the Universal Product Code Cross Reference File. Thus ensuring that the next time the number is scanned, a cross-reference to your (“our”) item number will be found.

9 Purchase order quantities are immediately checked against scanned amounts. Warnings are provided for overages.

10 Immediate access is provided to lot/serial number screens, when applicable.

The receiving process also provides a means to efficiently identify and record items that are received into the warehouse, as soon as they are delivered to the door. Whether the bar codes on the items (or boxes of items) are UPC symbols, vendor/item numbers, or your own (“our”) item numbers, Distribution A+ can read them.

Temporary Receiver File

Radio Frequency utilizes a Temporary Receiver File to store data about the receipts scanned using Radio Frequency. When you use Radio Frequency for receiving you are required to enter or allow the system to assign a receiver number as a means to group together the receipts for processing. This receiver number can indicate that it is either an existing receiver in the IBM i database (created through Purchasing or Warehouse Management prior to the receipt of the items), or a new receiver.

When the receiver number is identified on the transaction manager, no immediate checking against the database occurs, since this receiver is being created in the Temporary Receiver File. However, any purchase order number you scan in to identify the authorizing document for the receipt of the items is immediately validated. Likewise, the item numbers and quantities being received are checked against the purchase order to verify the request for the item(s). The check against the purchase order quantities immediately identifies if any overages are being entered.

Since a receiver can be created for less than the full quantity specified on the purchase order for a line item, it is possible to receive the entire quantity specified on the receiver, but still not receive the entire quantity specified on the purchase order for the line item. Similarly, you can receive less than

the quantity identified on the receiver, (i.e., the receiver is partially received). In Radio Frequency receiving, you can continue to use this receiver again as many times as you want until the posted received quantity of this line item equals or exceeds the item's quantity on the purchase order. As soon as you post a received quantity that equals or exceeds the quantity on the purchase order, that purchase order line item will be closed and you will not be allowed to receive against this purchase order number again for that line item.

In Radio Frequency receiving, anytime you exceed the quantity specified on the receiver for a line item, you will be warned that the identified receiver amount is being exceeded. However, you may continue to enter receipts until such time that you post receipts that equal or exceed the quantity on the purchase order. As soon as you post a received quantity that equals or exceeds the quantity on the purchase order, that purchase order line item will be closed and you will not be allowed to receive against this purchase order number again for that line item.

Note: In some instances it may be more appropriate to use Purchasing or Warehouse Management to enter receipts, since Radio Frequency requires that you individually enter the item numbers and quantities via the transaction manager. Using either one of these two modules, you can receive an entire purchase order as "complete," thus alleviating the need to individually identify each line item. The decision as to whether a particular warehouse can use Radio Frequency for receiving is made through Radio Frequency Options Maintenance (MENU RFFILE).

Once you enter all data for all items into the Temporary Receiver File, there are three ways to process the data:

- **Automatically using Radio Frequency**: If Radio Frequency options are setup accordingly, you may automatically update the Purchase Order Receiver files with the data entered in the Radio Frequency Temporary Receiver File, approve the data, assign the put-away numbers, and post the receipts. You can accomplish this by pressing **`F1=AUTO PA`** on the transaction manager to activate Auto Put-Away.
- **Automatically using Warehouse Management:** If Radio Frequency options are setup accordingly, you may review and change, if desired, the data in the Radio Frequency Temporary Receiver File. For example, you may decide to review and change the data after you compare the data to that previously entered into a receiver using Purchasing or Warehouse Management. You can accomplish this type of processing using the Radio Frequency Receipt Review Screen in Warehouse Management (MENU WMMAIN). After you make any changes to the information in the Temporary Receiver File, the data in the Purchase Order Receiver files can be updated with the data in the Temporary Receiver File. The data can then be approved, the put-away numbers assigned, and the receipts posted. You can accomplish all of this, except the review and related modifications, if any, by pressing **`F19=UPD W/PA`** on the **Radio Frequency Receipt Review Screen** to update the put-away.

  Note: When you automatically process data using either Radio Frequency or Warehouse Management, the put-away consists of reserving the locations, storing the items in a system location designated by all "fours" (i.e., 44.444.44), and optionally posting the inventory. Once the put-away numbers generated with the Put-Away List and Put-Away Labels have been confirmed, the items will be "moved" behind the scenes to the originally selected locations. Refer to the Put-Away sub-section of this chapter for details.
- **Manually using Warehouse Management:** You can review and modify the data in the Radio Frequency temporary receiver through Warehouse Management (MENU WMMAIN), similar to the explanation given for automatically updating using Warehouse Management. Once you

determine the data is correct, you can update the data in the Purchase Order Receiver files with data in the Temporary Receiver File by pressing F15=UPD RCVR on the **Radio Frequency Receipt Review Screen** to update the receiver. After the data has been brought into the Purchase Order Receiver files, you must then approve the data, do the put-away assignments, print the Put-Away List, and post the inventory.

Note: Inventory will be stored in a system location (all fours), unless the put-away numbers generated with the Put-Away List are confirmed prior to the posting of the inventory. Once the put-away numbers have been confirmed, the items will be “moved” behind the scenes to the originally selected locations. Also, an option exists to determine if posting will occur automatically upon the Put- Away List print.

Put-Away

Radio Frequency put-away includes using system-assigned put-away numbers to suggest the best travel paths for putting away inventory. If options are setup accordingly, put-away also enables you to automatically post inventory to the all “fours” (i.e., 44.444.44) receiving dock location after the Put-Away List prints. The option which determines this is defined in Warehouse Management Options Maintenance (MENU WMFILE).

Since Radio Frequency put-away requires the use of put-away numbers generated by the system when a Put-Away List and its related labels are printed, you must ensure that you turn on the Put-Away Lists and Put-Away Labels options. You also must determine through setup options when the received inventory will become available, and how the worker will physically put the items away.

Note: You can manipulate Radio Frequency system options to allow or disallow the use of Radio Frequency for putting away inventory. Refer to Radio Frequency Options Maintenance (MENU RFFILE) for details.

An option exists that allows the automatic posting of inventory when a Put-Away List prints. This option eliminates the need to perform the posting step manually and allows for items’ “quantity available” to update more quickly. You must, however, identify the items as having been added to the inventory but not yet scanned into the intended locations. To account for this, the system-defined location of all fours is available to capture these received items that have not yet been actually stored in their final locations. Once you confirm the put-away numbers, the items from the all fours location move “behind-the-scene” to the intended locations. (Any list or label you generate identifies the correct final destination location.)

The confirmation of these put-away numbers is another function of Radio Frequency put-away. This confirmation indicates that the items are now physically stored in the intended locations. This confirmation can occur for one put-away number at a time, or several. If you confirm more than one put-away number at a time using Radio Frequency, the system determines the best travel path for the worker to follow in order to efficiently walk though the warehouse putting the items into the desired locations.

Put-Away Numbers

All put-away transactions are assigned a system generated put-away number for unique identification. The format of the number is PXXXXX, where XXXXX is a sequential number.

There is no requirement in the process to re-scan in receipt information. You should use the **Put-Away Status Selection Screen**, accessed through Warehouse Management (MENU WMMAIN), to review the status of all pending and completed put-aways.

The type of information provided on this screen includes:

- Distribution A+ assigned put-away number, used for unique identification
- Current status of the transaction:
  - Pending - This means no activity has occurred since the put-away numbers have been assigned
  - In process - This means the put-away process has been initiated and is currently being performed in the warehouse
  - Stored - This means the items associated with the put-away numbers have been placed in their intended locations
- Warehouse ID and receiver number (toggled with the company ID and purchase order number)
- Quantity received and the unit of measure
- Item number(s) (toggled with location and vendor name)

After you identify an outstanding put-away transaction, and retrieve and attach the Put-Away Labels to the applicable received inventory, you can then use the transaction manager to create a suggested travel path.

Travel Path

The Radio Frequency put-away process includes the option to use a system-suggested travel path for putting away inventory. System-generated travel paths direct the most efficient movement within the warehouse to accomplish the put-away task in a timely manner. The information from which the travel path is derived consists of the scanned item data (item numbers, quantities, etc.) from the receiving process, and the put-away sequence defined through Location Master Maintenance (MENU WMFILE) for the intended locations.

While not required, using travel paths can be very advantageous, as shown in the example that follows. if your locations were stacked three (3) high on shelves, for example, and the one side of the aisle contained ten (10) Bin stacks, so you had 30 locations, you could assign put-away sequence numbers to have the handler go down the aisle filling all the top locations first down one side and then up the opposite side (10.001.001, 10.002.001, 10.003.001, etc.), then go back down and up the aisle filling the middle sections (10.001.002, 10.002.002, 10.003.002, etc.), and finally the bottom locations (10.001.003, 10.002.003, 10.003.003, etc.). Or the handler could fill the top, middle, and bottom location in the first bin stack (10.001.001, 10.001.002, 10.001.003, etc.), then move down to the next bin stack (10.002.001, 10.002.002, 10.002.003, etc.), etc. by assigning the put-away sequence numbers differently.

Assume the following is a typical row in the warehouse

Bin 1 Shelf 1	Bin 2 Shelf 1	Bin 3 Shelf 1	Bin 4 Shelf 1	Bin 5 Shelf 1
Bin 1 Shelf 2	Bin 2 Shelf 2	Bin 3 Shelf 2	Bin 4 Shelf 2	Bin 5 Shelf 2
Bin 1 Shelf 3	Bin 2 Shelf 3	Bin 3 Shelf 3	Bin 4 Shelf 3	Bin 5 Shelf 3

Example: Travel Paths

Assume that you need to put away a quantity of the following six different items: A1, A2, A3, A4, A5, and A6. The selected locations for the items and the assigned put-away sequence for those locations are listed in the following table. Using the put-away sequence for each of the selected locations, the system generates the following suggested travel paths (as shown in the table) when you scan the very first (lowest put-away sequence) location in your picking section, such as 10.001.001. The travel path directs the user up and down the rows, bins, and shelfs in the most efficient manner according to the warehouse design.

	Travel Path: By Shelf level down the Row and Bin		Travel Path: By Bin and Shelf level down the Row	
Put-Away Sequence	Go to Location: Row.Bin.Shelf	Item	Go to Location: Row.Bin.Shelf	Item
7	10.004.001	A1	10.002.002	A5
13	10.007.001	A6	10.004.001	A1
18	11.009.001	A4	10.007.001	A6
24	10.002.002	A5	11.009.001	A4
33	11.008.002	A2	11.008.002	A2
42	11.002.003	A3	11.002.003	A3

Inventory Access

The process of physically putting items on the shelf includes scanning both the location being filled and the put-away number of the items being put away. If the items had been posted to the receiving dock prior to being physically shelved, this scanning makes the inventory immediately available for Order Entry processing. There is no longer a wait between the time the inventory is physically stored and the time access is allowed by Order Entry.

Note: You may determine to have a prompt display the location for validation, rather than requiring a scan of the location through Radio Frequency Options Maintenance (MENU RFFILE). You will then only be required to key an acknowledgment.

If the items did not post to the receiving dock, normal posting processes must occur after the inventory is physically shelved.

Location Overrides

If the put-away location is occupied or lacks sufficient space, the location may be overridden when the item is put away. When overrides occur, the overridden location is written to the Location Research File (**RFRSH**), so that it can be reviewed. The cause of the override should be investigated so appropriate action can be taken (e.g., cycle counting the location or adjusting the location size) to prevent the incorrect assignment of put-away locations.

Moving Inventory

Radio Frequency moving allows you to generate unique move numbers for certain quantity movements through the use of Warehouse Management and Radio Frequency system-assigned move numbers. These move numbers suggest the best travel paths for collecting and putting away inventory. Radio Frequency moving also allows for “on-the-fly” creation of needed moves to replenish and/or consolidate inventory locations.

Radio Frequency allows three types of moves:

- Label Moves
- Stock Moves
- Replenish Moves

Additionally, each type of move has two modes, single-mode processing for single moves and multi-mode processing for multiple moves. These modes allow you to decide the most efficient way to move your inventory. Single-mode processing uses fewer screens and function keys, allowing you to perform a single move quickly. Multi-mode processing provides a full range of screens and function keys for doing more complex multiple moves.

Note: You may designate whether you want to allow the use of Radio Frequency for moving inventory through Radio Frequency system options. Refer to Radio Frequency Options Maintenance (MENU RFFILE) for more details.

During the processing cycle for move transactions, the validity checking for locations will always omit display and selection of the following locations:

- Shipping Dock: the system generated shipping dock (all 5’s location)
- Receiving Dock: the system generated receiving dock (all 4’s location)
- Locations that are reserved for transactions in process; the assigned sequence number will be greater than 9000.

Label Moves

Label moves are those moves which are affiliated with move numbers. Move numbers are automatically assigned to certain move transactions to provide unique identification.

Note: In order to use move numbers, the option to use Move Labels in Warehouse Management Options Maintenance (MENU WMFILE) must be activated. Refer to the Warehouse Management User Guide for details.

Move transactions are created using one of the following:

- Manual creation as non-immediate, such as using Warehouse Management (MENU WMMAIN)
- Suggested Move Report (MENU WMMAIN)
- System creation, such as when a permanent item falls below its specified stock quantity, as identified through Location Master Maintenance (MENU WMFILE)

Note: When Radio Frequency Picking or Pick List printing results in a permanent item falling below its specified stock quantity, the replenishment trigger defined through Radio Frequency Options Maintenance (MENU RFFILE) determines if a move will be generated when either the item is picked from the location via the transaction manager, or the Pick List is printed for the order on which the item exists. Refer to Radio Frequency Options for more details.

The format of the move number is MXXXXX, where XXXXX is a sequential number. Like the put-away processes which use either a single number at a time, or many numbers, move numbers can be entered through the transaction manager one at a time and processed individually, or several move numbers can be identified so that a system-generated travel path can be provided.

Radio Frequency allows for the automatic creation of travel paths for moving inventory in somewhat the same manner as described for receiving inventory. The difference, however, is that moving actually consists of two steps: picking and putting away. The picking portion of the move travel path is system determined by a review of the locations that the items are to be moved from. In other words, the picking sequence in Location Master Maintenance (MENU WMMFILE) for the from locations is used to determine the travel path. Once the items have been picked from their locations, the system determines the put-away portion of the move travel path by reviewing the picking sequence of the to locations in Location Master Maintenance (MENU WMFILE). The following example provides further explanation.

Example:

Assume that you need to move quantity of the following four items: A1, A2, A3, and A4.

The following table lists the location from which each item is to be picked and the location's assigned picking sequence.

Item	From Location	Picking Sequence
A1	10.111.111	7
A2	11.128.107	33
A3	11.162.325	42
A4	11.111.124	18

Example:

The following table lists the location into which each item will be stored and the location's assigned picking sequence.

Example:

Item	To Location	Picking Sequence
A1	11.128.105	31
A2	11.188.117	63
A3	11.111.121	15
A4	11.111.119	13

Using the above picking sequence for each of the from locations and beginning at the location with the lowest picking sequence, the system would generate the suggested travel path as shown in the next table.

Go to Location	Pick Item	Picking Sequence
10.111.111	A1	7
11.111.124	A4	18
11.128.107	A2	33
11.162.325	A3	42

Once all the items are picked, the system reviews the to locations to determine the picking sequences and generates another travel path as shown in the table below.

Go To Location	Pick Item	Picking Sequence
11.111.119	A4	13
11.111.121	A3	15
11.128.105	A1	31
11.188.117	A2	63

Like the Radio Frequency put-away process, the process of physically putting items on the shelf during the move includes scanning the location and the move number of the items being moved. The difference is that the items to be moved must first be identified when pulled from the location (picked), and again when the items are placed in their new locations (stored).

Note: Through Radio Frequency Options Maintenance (MENU RFFILE), you may determine to have a prompt display the location for validation, rather than requiring a scan of the location. You will then only be required to key an acknowledgment.

Stock Moves

You can use stock moves to remove a quantity of an item from one location and place it in another, usually to empty one location for consolidation or other purposes. The handler manually determines these moves and requires no system-generated move numbers.

Stock moves require that you first remove the items you want to move from an identified location, and then place them into a new location. This is similar to the label move process, but without the assigned move numbers. When the quantity is added to the “to” location, it signifies the completion of the move and inventory is updated to reflect that move.

Replenish Moves

You can use replenish moves to fill an under-stocked location with a specified item. A handler determines these moves, like stock moves, and system-generated move numbers are not required.

The replenish process identifies the location that needs replenishment, then identifies the location from which the item is to be taken. This is unlike the stock move process, which instead first identifies a location that has too much of the item. When selecting the location to replenish from, locations are omitted when:

- the location is set to **N** for **Use for Replenishment** in Location Master Maintenance (MENU WMFILE)
- is it a location that is also being suggested for replenishment
- the available quantity is less than the quantity needed considering all stocking units of measure

With replenishment moves, when the items are in their final destination and the move is complete, the inventory is updated to reflect the move that occurred.

Counting Inventory

Radio Frequency counting inventory eliminates the need to produce hard copy Count Sheets. After you run Print Count Sheets (MENU WHPHYS) to determine the locations to count, the pick sequence for each of those locations may be used to generate a system-directed travel path, eliminating the need to print the hard copy output. The system-directed travel path can be accessed from the Radio Frequency transaction manager. This travel path helps ensure that all appropriate locations are counted. Also, if desired, when you count the inventory and enter the counts on the transaction manager, the system can compare your counts with the “database” inventory quantities to allow for immediate recounts for variances.

One of the more time-consuming and arduous warehouse tasks is that of physically counting your inventory. Using Warehouse Management alone, the process of performing a physical count is generally performed as follows:

1 Count Sheets are generated and printed, freezing physical inventory counts.

2 Employees perform the counts.

3 Count Sheets are returned and counts are keyed.

4 Reports are run to indicate variances between the expected counts and the true counts.

5 Count Verification Sheets are printed for those items with variances beyond the user-defined scope.

6 Employees perform recounts.

7 Count Verification Sheets are returned and counts are keyed.

8 Counts are posted.

Using Refreeze Physical Inventory Counts (MENU WMPHYS) much of the time and energy needed to re-count inventory as well as reduce hard copy handling, is eliminated. The Radio Frequency system can be set up to refreeze a location at the time it is counted; refer to the Warehouse Management manual for details about refreezing inventory. Note that while the initial freezing of the inventory counts when generating the Count Sheets is required, it is not required to physically print the hard copy Count Sheets.

Additionally, when you run Print Count Sheets (MENU WMPHYS), a file is created that contains the locations to be counted. This file is used to create a system-directed travel path. This path directs the user through the warehouse to count the applicable locations.

Also, if while counting inventory the counts scanned at a location do not match the expected counts, a warning message displays on the transaction manager. This allows the handler to recount for verification, to ensure a counting mistake was not made. The option to force recounts for such variances is available through Radio Frequency Options Maintenance (MENU RFFILE).

Note: Through Radio Frequency system options you may designate whether you want to allow the use of Radio Frequency for counting inventory. Refer to Radio Frequency Options Maintenance (MENU RFFILE) for more information.

Travel Path

Radio Frequency automatically creates travel paths for counting inventory in somewhat the same manner as described for putting away inventory. There is one difference, however, the path is generated using the pick sequence of the locations to be counted versus using the put-away sequence. As previously described, the locations to be counted are determined by running Print Count Sheets (MENU WMPHYS).

Inventory Access

The process of counting inventory in Radio Frequency includes scanning the location and identifying the items that have to be counted. Although comparisons are made immediately from the keyed count to the expected “on-hand” count, valuation reports are usually still desired for review. Therefore, after running and reviewing variance reports, the same inventory files updated when entering counts through Enter/Change Inventory Counts (MENU WMPHYS) are updated when

performing counts through Radio Frequency. Update Inventory Counts (MENU WMPHYS) must still be used to post inventory counts.

Shipping Inventory

This feature is similar to the Warehouse Management boxing confirmation process. Once the items are removed from the shelf, boxed, and labeled, you can use the transaction manager to “confirm” shipment out of the warehouse. This ship confirmation is accomplished automatically when the last item (or box) is scanned as “shipped.”

Note: Through Radio Frequency system options you may designate whether you want to allow the use of Radio Frequency for shipping confirmations. Refer to Radio Frequency Options Maintenance (MENU RFFILE) for more details. Additionally, this feature is similar to the Box Confirmation feature in Warehouse Management, described in the Warehouse Management manual.

Picking Inventory

Radio Frequency picking allows you to verify items and the locations from which they are picked. The system directs the Radio Frequency handler to follow the most efficient travel path to pick the items using the pick sequences of the locations from which inventory will be taken. Items are picked for multiple orders or containers in a single pass (known as “wave picking”). If for any reason an item cannot be picked (e.g., it is damaged or missing from an identified location), you can select an alternate location to pick the item from or backorder the item. When you backorder the item in Radio Frequency, the sales order is updated accordingly.

For Work Orders

If you are using Value Added Services, you can pick work orders with an RF device, allowing work orders to be picked and automatically pick confirmed with Radio Frequency. To pick work orders using Radio Frequency, handlers will select the system-defined picking task. When picking work orders the RF handler will be prompted for the work order number on the Pick Confirm Screen, never a box number. Work orders cannot be selected to be picked by a container or box number. Work orders and regular orders can both be selected to be picked during the same picking operation/task. Otherwise, the handler follows the normal picking procedure for picking reservations of work order lines. Once all reservations of a work order line have been picked, the status of the work order line is updated to “Pick Confirmed.”

If a work order line cannot be picked completely because one or more components were material short, the line will be split. Splitting the line will update the quantity committed with the quantity picked. The system will create a new line for the component where the quantity ordered is the quantity that was unable to be picked. This new line will have a status of “Material Short.”

Once all lines of the work order have been RF picked, the system will pick confirm the entire work order and update the Pick List Confirmation File (**WOPLR**) with the date and time the work order

was confirmed. The user ID of the handler who picked the last line on the work order is designated as the user who pick confirmed the work order, even if other handlers previously picked other lines.

Pick confirmed work orders put inventory in the work order Work-In-Process (WIP) location. If there is not WIP location or it is not being used, inventory is allocated in the original location.

Ship Confirm After Pick Confirm

The option to automatically set the Order Status to “Ready for Invoice” after an order has been “Pick Confirmed” may be set through Radio Frequency Options Maintenance (MENU RFFILE). If you select **Y** through this option, the order status will be changed to “Ready for Invoice” after all items have been picked. Additionally, if the **Print Pack List after Ship Cnfrm** field is set to **Y** through Order Entry Options Maintenance (MENU XAFILE), Pack Lists will automatically print for an order after that order has been ship confirmed.

Note: If the RF Task option to use RF Shipping set in Radio Frequency Options Maintenance (MENU RFFILE) is set to **Y**, then the **Ship Confirm after last pick** field must be set to **N**. If you are using Warehouse Management, you may set the status of an order to automatically change to “Ready to Invoice” after the last box is confirmed for shipment by setting the **Chg Order Status after Last Box** field to **Y** through Warehouse Management Options Maintenance (MENU WMFILE). It should be noted that both of these options may not be set to Y simultaneously.

User-Defined Tasks

The second task area, user-defined tasks, you create specifically to meet any additional needs of your warehouse (for example, you may need to define and track tasks outside of the normal warehouse realm). The user-defined tasks available in Radio Frequency depend on those defined through User Tasks Maintenance (MENU RFFILE). You may create an unlimited number of user-defined tasks for which activity can occur and be tracked. For example, you may wish to keep statistics regarding how much of each day is spent on research tasks, lost time, lunch breaks, and so forth. A list of all tasks, including user-defined tasks, is available for viewing or may be printed via the Radio Frequency File Maintenance Menu.

Note: The use of Radio Frequency in performing any system-defined task is determined through Radio Frequency Options Maintenance (MENU RFFILE) for each warehouse. When you establish user-defined tasks through User Tasks Maintenance (MENU RFFILE) for each warehouse, you determine which tasks will be performed.

Transaction Manager

For a description of the transaction manager and information about performing Radio Frequency tasks with on a transaction manager, refer to the Radio Frequency Transaction Manager User Guide.

Management Tasks

The third major task area, management tasks, is made available through Radio Frequency from the IBM i workstation. Some of the management tasks available in Radio Frequency include:

- Providing and/or limiting access to certain tasks by handler
- Providing and/or limiting access to certain vehicles by task
- Employee performance monitoring including time tracking, work statistics, and comparative analysis with bar graph displays
- Transaction manager simulation screens, useful for training
- Sending messages from the IBM i workstation to the remote transaction managers

Radio Frequency provides management tasks to assist with the daily activities in the warehouse. While most Radio Frequency tasks are generally performed at remote locations, managerial tasks are performed only from an IBM i workstation. For example, due to the sensitivity of data resulting from some tasks (e.g., employee performance comparisons and evaluations), access to certain Radio Frequency menus and options is required. In addition to the varying levels of Distribution A+ security, you might have the need to limit activities to certain employees.

Imposing Limits

Warehouse employees are often grouped into categories based on a primary activity when you set up Distribution A+. For example, you might use Radio Frequency for the system-defined tasks of receiving, put-away, counting, moving, picking, and shipping. User-defined tasks might be used to define shrink wrapping and cleanup, as well as be used to create handler categories such as manager, dock hand, driver, and so on.

In cases where employees are grouped into particular categories, it makes sense that you only allow certain categories of employees to perform certain tasks. For instance, you may not want your top three dock hands inside the warehouse counting inventory. To prevent this, you can place limitations on which tasks those employees are allowed to perform. Once you prevent an employee category from performing a task in this manner, that employee category will no longer be allowed to log onto Distribution A+ and select that type of task.

In addition to limits being placed on handlers to allow or prevent certain tasks, limits can be placed on vehicle use. You can determine what tasks a vehicle may perform. By limiting tasks (and therefore, handlers) that a vehicle can perform, you can ensure equipment is not misused. Vehicle

usage is tracked and maintained the same way as employee performance. This information can be saved and analyzed for determining value, length of viability, and more.

The following table describes how handlers and vehicles are set up for use with Radio Frequency. Each option is available from the Radio Frequency File Maintenance Menu

Type or Task	Where Defined or Assigned
Handler	Handlers Maintenance
Handler Types (e.g., manager, dock hand, etc.)	Handler Types Maintenance
Handler Access to System and User-Defined Activities	Handler Tasks Maintenance
System-Defined Tasks	Radio Frequency Options Maintenance
Vehicle Types (e.g., forklift)	Vehicle Types Maintenance
User-Defined Tasks	User Tasks Maintenance
Vehicle Numbers	Vehicles Maintenance
Vehicle Use for Specific Tasks (system and/or user-defined)	Vehicle Tasks Maintenance

Work Statistics & Performance Monitoring

Radio Frequency captures time, task, vehicle, and employee data pertaining to work performed in the warehouse. The system retains such data as:

- Time on
- Time off
- Total time
- Quantitative values that relate to the number of items and amount of work performed
- Identification of the employee (and, if applicable, vehicle) performing the task

Because Radio Frequency provides time tracking, it is essential that real time worked on each task is captured accurately. To ensure this, Radio Frequency allows you to interrupt one task to work on another task. While you work on the second task, the first task stops, so it does not adversely affect the monitoring of time actually spent performing that task. However, the suspended time is captured and calculated into the total time it takes from beginning to end, to complete the task. This is known as the “elapsed” time.

Refer to the following example for a description of elapsed time versus work time.

Example:

Handler 101 starts a task on Tuesday at 9:00 AM. Handler 101 works until 12:00, suspends the task and takes an hour lunch. After lunch, handler 101 returns to the task and completes it at 3:00 PM. The table below illustrates how the elapsed time for the task adds up to six hours, and the work time adds up to five hours.

Real Time	Hours	Type of Time
9:00 am - 12:00 pm	3	Work
12:00 pm - 1:00 pm	1	Non-Work (Lunch)
1:00 pm - 3:00 pm	2	Work

Work + Work + Non-Work = Elapsed Time

3 + 2 + 1 = 6

Work + Work = Work Time

3 + 2 = 5

The transaction manager does not have to be physically turned on to capture this elapsed time. For example, a handler can initiate a user-defined task of LUNCH BREAK and then, without exiting the LUNCH BREAK task, turn the transaction manager off. After lunch, when the handler turns the transaction manager back on, a prompt to restart the LUNCH BREAK task is provided. The handler can restart the task, then end the task. The entire time, from the initiation of the task to the ending of the task, is retained as if the transaction manager was never shut off. Accidental incidents of turning off the transaction manager are handled the same way.

The Radio Frequency tracking method allows for detailed, accurate inquiries to provide informational, statistical, and comparative analyses. The Handler Inquiry (MENU RFMAIN) provides a display of the Handler Log for individual handlers. Information displayed consists of elapsed time, actual time, current activity, task name, user name, items (number, quantities, boxes, locations, cubes and weights), and vehicle. Criteria to narrow the scope of the inquiry about a handler in a warehouse can be keyed for dates, vehicle types, specific vehicle numbers, or certain tasks. The Handler Log can be printed through Handler Log Report (MENU RFREPT) for one or more handlers.

Note: The Vehicle Log is similar to the Handler Log, except it is based on vehicle rather than handler. This Vehicle Log may be printed through Vehicle Log Report (MENU RFREPT).

Statistical and comparative inquiries are performed through Handler Performance Inquiry (MENU RFMAIN). For evaluation purposes, handler performance of one or more tasks can be compared against that of a single co-worker or all handlers, or against that of a pre-defined “work standard.”

A work standard is defined by identifying the total amount of time each day that is usually (or optimally) required to perform a task, and by identifying the total number of items (including how much weight, how many cubes, quantities, and so forth) that should be involved in that task, for that time. Work standards are defined for a task, and optionally a handler type, through Work Standards Maintenance (MENU RFFILE).

Comparative data is presented for times and items involved. A specific time category (i.e., elapsed or work) or a specific item category (e.g., weight, quantity, location, etc.) can be selected for a detailed display in bar graph format.

Graph Displays

Radio Frequency bar graphing displays in Radio Frequency according to default and user- provided definitions. The first bar appears in high intensity with the * character, while the second bar appears in low intensity with the # character. You can change the time frame for the display, and the graph redraws accordingly.

If you are not satisfied with the appearance of the graph due to disproportionate high or low values, you can change the scale of the graph by day, week, or month, and modify the top and/or bottom scales to reflect varying times.

Messages

Radio Frequency provides the ability to send messages from an IBM i terminal to the transaction manager of one or more handlers. On a variety of screens and lists displayed through MENU RFMAIN and MENU RFFILE, a function key is available to allow you to key message text to be sent to one or more handlers. Once sent to a handler, the message displays on the transaction manager the very next time the handler attempts any activity on that transaction manager.

Messages sent in this manner are extremely efficient and are of great use. For example, you can send a message to identify the need to interrupt one task to attend to a higher priority task. In this case, Radio Frequency allows the handler to suspend the first task so it does not adversely affect work standards tracking. You will be able to restart interrupted tasks when prompted by Radio Frequency to restart all interrupted tasks each time an activity begins. This action prevents you from forgetting a suspended task.