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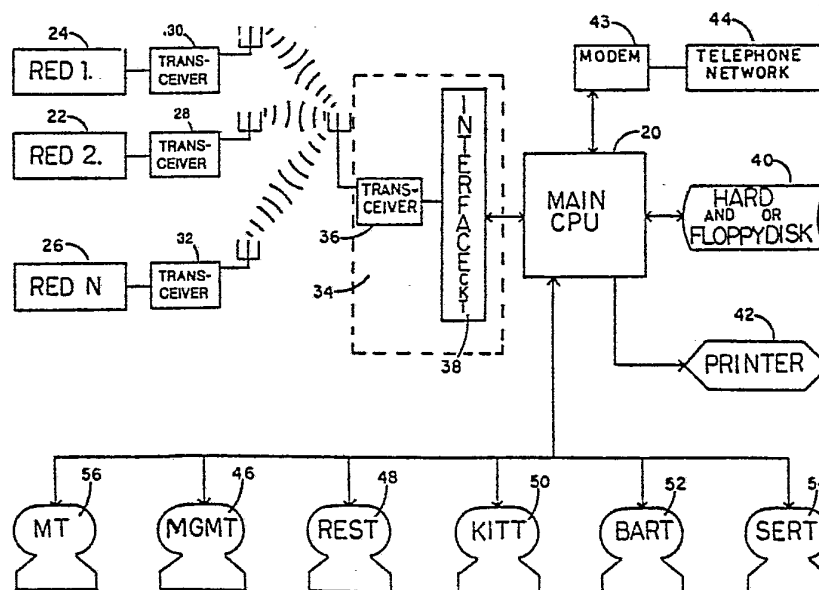
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(54) Title: SYSTEM WITH REMOTE COMPUTER DATA ENTRY DEVICE, ASSOCIATED APPARATUS AND METHOD OF USING SAME



(57) Abstract

A system useful in a restaurant for processing, controlling and displaying information employing a remote, portable terminal (22, 24, 26) for remote entry of food and drink orders directly to a computer (20) which causes display of order information at kitchen and bar CRT terminals (50, 52). Display of information and entry of data relative to busboy, management and reservations is provided at other fixed terminals whereat other data may be entered.

-1-

SYSTEM WITH REMOTE COMPUTER
DATA ENTRY DEVICE, ASSOCIATED APPARATUS
AND METHOD OF USING SAME

BACKGROUND OF THE INVENTION

5 This invention relates generally to a system including a remote, portable computer data entry device to enter data into a computer for processing, control and subsequent communication display, and more particularly, such a system in which the portable data entry device establishes data entry communication with the computer through airwave transmission.

10 More particularly, this invention relates to such a system which is used to convey and process information relating to operation of a restaurant or the like.

15 Recent advances in digital electronics have resulted in a variety of computers and other electronic apparatus suitable for use in small businesses. Typically, such personal or small business computers consist of a microprocessor-based, stored program control system for data manipulation, a random access memory, or RAM, for temporary data storage, floppy disk and hard disk drives for permanent large volume data storage, cathode ray tubes, or CRT's, for data entry and communication display and printers for hard copy output.

20 Known small computers are designed for data entry through a keyboard associated with a CRT, printer or both which are directly wire connected with the remaining portions of the system. Such limited data entry mechanisms restrict the utility of such computers and prevent such computer systems from functioning as effective communication systems. The inability to use such terminals remotely from the computer unless a hard wire connection is made therewith precludes many advantageous applications.

30
35 Computer systems are known which have portable

-2-

remote data entry terminals and examples of these are shown in U.S. Patents 3,456,244; 3,624,615; 3,678,391; 3,872,445; 3,899,775; 4,019,174; 4,041,469; 4,300,040; and 4,301,506. Other remote computer terminals for data entry are shown in U.S. Patents 3,281,789; 3,937,004; 3,942,157; 3,956,740; 3,976,840; 3,976,995; 4,005,388, 4,007,443. Unfortunately, such data entry devices and the systems associated therewith are inadequate for numerous applications such as inventory taking and control and restaurant operation communications because of the need for wire connections between the computer and the various input/output terminals.

For instance, there is a need in the operation of restaurant business for systems which permit entry of data to a computer from remote table locations. This need has not been met. Accordingly, in a typical modern restaurant, all order entry, processing, and service functions are performed manually. For example:

1) Reservations are manually recorded on a piece of paper at the reception desk.

2) Upon arrival of the customer, reservations are checked manually.

3) Table availability is checked manually.

4) The menu is presented to the customers and then orders are taken manually on an order form.

5) Then the order form or copy of the order form is hand delivered to the kitchen and/or bar.

6) Based on this information, the chef and/or bartenders manually sort through the orders and prepare food and/or drinks,

7) The waitress returns to the kitchen and/or bar to pick up ordered food and/or drinks and serves the customer.

8) The final bill is prepared on yet another piece of paper. The waitress walks to the main reception area with the bills for financial computation which is



generally performed manually or occasionally by a stand alone terminal that requires keyboard entry of all order entries.

SUMMARY OF THE INVENTION

5 It is therefore an object of this parent invention to provide an apparatus for entry of data to a computer in which a hand held, portable remote entry device is employed that transmits the data to be entered into the computer by airwave transmission.

10 Interfacing means associated with the computer receives the airwave transmitted data, translates the received data into a form suitable for processing by the computer, and provides the translated data to the computer.

15 It is also an object of this invention to provide a remote data entry device in conjunction with a restaurant communication system in which the remote, portable, entry device is used for direct entry of food orders into a computer which, in turn, processes and displays this information at kitchen terminals, busboy terminals and other locations to facilitate and automate key restaurant functions such as table assignments, customer ordertaking, cooking, serving order analysis, inventory control and the like.

20 Advantageously, the resultant improved communication customer service reduces labor costs. In particular, the system functions to:

- 25 1. Minimize paperwork and time for order entry, billing, order analysis and the like;
- 30 2. Provide management visibility and control through inventory control, order analysis, employee analysis and the like;
3. Minimize unnecessary movement of employees transferring paper back and forth; and
- 35 4. Reduce the number of restaurant employees by reducing the number of waitresses to a few key waitresses with remote entry devices to take orders and increase

-4-

customer contacts. The remainder of the service staff can be limited to performance of busboy functions.

5 Yet another object of the present invention is to provide an interface for a computer which will receive airwave transmitted data from a remote entry device and convert that data to a format, such as EIA standard format, which can be utilized by a computer.

10 A further object is to provide a system for direct communication between a computer and a remote entry device in which error detection and correction, security and cross talk or other interruption prevention features are provided to facilitate reliable communication.

15 It is a further objective of the invention to provide a system employing a remote entry device and a computer in which one or more of the following devices or features are provided therewith.

20 1) One or more reservation display terminals, such as CRT displaying terminals, for selection and display of meal reservations, table assignments, telephone message and the like.

2) One or more printers for printing itemized bills and reports.

25 3) One or more kitchen/cook CRT display terminals for instant display of food orders from the remote entry device and for work-in-process analysis.

4) One or more bar/bartender CRT display terminals for instant display of drink orders from the remote entry device and for work-in-process analysis.

30 5) One or more service/busboy CRT display terminals for instant display of orders ready to be served and identification of tables ready to be cleared.

35 6) One or more management/manager CRT display terminals for instant display of floor status, order status, and data processing functions to generate reports and the like.

7) One or more remote hand held, wireless remote entry devices (RED) for directly entering and retrieving



customer orders to and from the computer;

8) One or more general purpose, small computers with a stored program control system and floppy disk and/or hand disks to perform long term data storage for menus and the like and electronic memory for short term storage, food orders, table assignments and the like and Computation ability if provided for order analysis, priority establishment and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing features and advantages will be described in greater detail and further objects, features and advantages will be made apparent in the following detailed description which is given with reference to the views of the drawing in which:

Fig. 1 is an overall block diagram of the system of the present invention in a restaurant application;

Fig. 2 is a block diagram illustrating the two way airwave transmission interface between the remote entry device and the computer;

Fig. 3 is a perspective view of the remote entry device showing its keyboard and display;

Fig. 4 is a chart illustrating the data format for the communication between the remote entry device and the computer.

Fig. 5 is a logic flow chart of the communication between the remote entry device and the computer;

Fig. 6 is a logic flow chart for the establishment and termination of communication between the remote entry device and the computer;

Fig. 7 is a logic flow chart of the system of the present invention as used in a restaurant application;



C. In which the food order information for all tables is organized by item.

Fig. 8 is a functional block diagram of the system in a restaurant application;

5 Fig. 9 is a subsystem block diagram of the various types of data communicated through or organized by the system;

Fig. 10 is an illustration of a typical floor status display of the management terminals MGMT of Fig. 1;

Fig. 11 is an illustration of a typical display of the service terminal SERT of Fig. 1;

Fig. 12 is an illustration of a typical reservation status display at the reservation terminal REST of Fig. 1;

Fig. 13A is an illustration of a typical main kitchen display at the kitchen terminal KITT of Fig. 1;

Fig. 13B is an illustration of another typical kitchen display by order at the kitchen terminal of Fig. 1B;

Fig. 13C is an illustration of yet another typical kitchen display by item at the kitchen terminal KITT of Fig. 1C;

Fig. 14A is an illustration of a typical main bar display at the bartender terminal BART of Fig. 1 in which the drink order for a given table is organized by drink name and quantity;

Fig. 14B is an illustration of another typical main bar display of the bartender terminal BART of Fig. 1; and

Fig. 14C is an illustration of yet another typical bar display of the bar terminal BART of Fig. 1 in which the information is organized by item

DETAILED DESCRIPTION

35 Reference now to Fig. 1, the system of the present invention as used in a restaurant is seen to comprise a



computer or main CPU, 20 with a stored control program; a plurality of remote entry devices 22, 24 and 26 with associated transceiver 36 and an interface circuit 38 for interfacing the main CPU
5 20 with the remote entry devices 22, 24 and 26.

Off line data storage is provided by floppy and/or hard disks with Winchester disk shoe 40 or the like. Other inputs to and/or outputs from the computer 20 are provided by means of a plurality
10 of CRT display terminals including:

a printer 44 is coupled with the computer and provides one form of computer output;

a modem 43 is provided for interfacing the computer 20 with a telephone network 44;

15 a manager terminal, or MGMT, 46;

a reservation/reception terminal, or REST,
48;

a kitchen terminal, or KITT, 50;

a bar terminal, or BART, 52; and

20 a service terminal or, SERT, 54.

Additional KITT, SERT, BART, REST, PRNT, and/or MGMT may be added in any combination of multiple terminals, or MT's, 56.

The remote entry devices 22, 24 and 26 are
25 used for entering customer orders to the computer 20 from remote locations through air transmissions by their associated transceivers 28, 30 and 32. Low power UHF radio wave transmission or light wave transmission may be used. The interface 34 includes the
30 transceiver 36 for receiving and transmitting data and the interface circuit for translating the data into a form suitable for use by the computer 20 and providing it to the computer 20. Data from the computer 20 is also transmitted to the remote entry
35 devices 22, 24 and 26 through the interface 34. Preferably the two-way communication between the

-8-

remote entry devices and the computer uses a standard EIA RS 232C type link.

Referring to Fig. 2 remote entry devices are substantially identical to one another. Each of them, 5 such as remote entry devices 24 and 26, include a microprocessor or CPO 58 for controlling communications, storage and display. An alphanumeric and function keyboard is provided for manual entry of data and for manual control functions. A display, 10 such as an LCD display 62, displays received or transmitted blocks of data in alphanumeric figures. A random access memory 64 is provided for temporary data storage, and a read only memory 66 is provided for program storage. A modulator 68 coupled with 15 the computer 58 is used to impress carrier waves with data to be sent to the computer by transceiver 30 via a broadcast antenna 29. Data from the computer 20, on the other hand, is demodulated by a demodulator 72 and coupled to the microprocessor 20 58 through suitable interfacing circuitry (not shown). The interface 34 likewise has a modulator 74 and a demodulator 76 for data to and from the remote entry devices.

Referring to Fig. 3, the remote entry devices may 25 be very similar to commercially available hand held computers, such as made by Radio Shack or Matsushita with additional suitable hardware and software added for airwave communication. In addition to standard alphabetic keys 78 and numeric keys 80, 30 control keys and associated computer functions are provided to simplify operation.

Actuation of key 82 labelled NEW clears remote entry device memory and causes transmission of an identification code associated with the remote 35 entry device to enable subsequent transmission to and receipt by the computer 20 of new customer orders.



A key 84, labelled CAN, allows cancellation of customer orders previously entered.

A key 86 labelled RECALL allows easy retrieval and display for amendment of customer orders
5 previously entered.

The key 88, labelled FOR for forward and the key 90 labelled REV for reverse permits forward and reverse scanning on display 62 of individual orders associated with a given table order.

10 Further control function keys include key 92 labelled CHECK IN/OUT, which is used when a waitress wishes to check-in and check-out at the beginning and end of work shift, as will be explained in greater detail with reference to Fig. 6.

15 A key 94 labelled REP is enabled whenever the computer is either in the RECALL or the NEW mode to repeat entry of the same order when actuated. For instance, if four people ordered the same menu item, instead of the waitress keying in each item four
20 times individually, the entry could be made simply by pressing the REP key three times after the initial entry is keyed in.

A key 96 labelled HELP is actuated when the user needs assistance to determine the meaning of pre-
25 defined menu codes. The system is designed so that if menu code 101 stood for crab legs, then depressing key 96 and keying in the number 101 will cause the display 62 to show CRAB LEGS.

The four keys 98, 100, 102 and 104, labelled F1,
30 F2, F3 and F4, respectively are used for functions which can be programmed into the computer 20 and 58 to suit specific needs of individual restaurants.

A plurality of lights are provided to indicate the overall status of the remote entry device. A
35 light 106 labelled ONLINE LIGHT shows whether remote entry device is in communication with the computer.

-10-

Light 108, labelled BUSY signifies that the airwave communication channel with the computer is occupied by another remote entry device.

Light 110, labelled RCHG is provided to indicate when the battery power source of the remote entry device needs recharging. Alternately these status indications are provided on the twenty-four character display 62 by appropriate messages, rather than by light indicators.

Each of the remote entry devices also has a small antenna 112 to capture airwave signals transmitted by the computer 20 through interface 34.

The format for communication between remote entry devices 22, 24, and 26 and the computer 20 is illustrated in Figs. 4, 5 and 6. First the RED has food order data entered into it and the ENTER key 91 is actuated to send the data to the computer 20. In response to actuation of the ENTER key 91, the RED transmits an identification number code to the computer. Upon receipt of the identification, or ID number, the computer verifies that the number is a valid number from a list of valid numbers. If so, the computer sends the same ID number to all the RED's. Only the original RED which receives back to its own ID number is authorized to use the communication link for data transmission and is enabled to transmit. All other RED's which received a number other than their own ID number are locked out and prevented from communicating until the computer sends a release code.

The authorized RED then transmits in binary asynchronis form, with start and stop pulses, a block of data, a block number or parity block and its identification number, ID. The first transmission of the ID signifies start of data, and the last ID number signifies the end of data.

If the block of data is received error free with



proper block parity, the computer sends a release signal which is received by all RED's. This unlocks all of the RED's and enables them to initiate communication with the computer 20. If the data is received with error, the computer sends a retransmit code and the data must be retransmitted by the authorized RED.

The overall frame format of the data transmission is shown in Figure 4. While other coding formats could be used, it is preferred to use an ASCII code format with start, stop, and parity pulses. A seven or eight bit ASCII is adequate to efficiently transmit the food order and other information to the computer.

Since there are multiple RED's it is possible that initially in the process of capturing the communication channel that more than one RED could transmit its ID number at the exact same time, resulting in contention. In this event, the computer 20 will fail to recognize either ID# even though authorized and will send a release code. Upon receipt of the release code, each of the RED's will retransmit its data block in accordance with a built in, random retransmission sequence. So that one of the RED's involved in contention will retransmit automatically before the other and this captures the communication channel. In very large systems, multiple channels may be used so that plural RED's may simultaneously communicate with the computer 20.

As shown in Fig. 5, when the data link is captured and in use by one of the RED's and a user of another RED transmits data, the system will wait until the data communication link is not in use. Based on a built-in random start sequence, the RED will "camp" on the communication channel and automatically capture it when it opens after termination of communication with



-12-

the prior RED.

The system of the present invention functions in accordance with the logic flow chart of Fig. 7. As seen, reservation information is entered into the computer from, and displayed at, the reservation terminal 48. In addition to the internal reservation information, the system provides for the display of messages to the parties for which reservations are made at the reservation terminal 48.

As also illustrated in Fig. 7, the orders entered by the RED is processed by the computer 20, and displayed at the kitchen terminal 50 and the bar terminal 52. The kitchen terminal 50 and bar terminal 52 also have means for requesting information relating to completion of orders for pickup. The computer 20 processes the information and displays it at the service terminal 52 when orders are ready for service. Finally, the computer operates a bill based on the order, and controls printer 42 to print the bill.

The system functions in sequence as follows:

1. The customer calls to make a reservation. The reservation terminal 48 display is used to determine the reservation status, and reservation data is entered in the computer based on such display.
2. The customer arrives at the restaurant and confirms his reservation. If made in advance at the reception desk through the reservation terminal 48, the display verifies the prior reservation. At this point any telephone messages would be displayed upon request at the reservation terminal 48 and conveyed to the customer.
3. Based on table availability as shown at the reservation terminal display through the floor status display, Fig. 10, a specific table is assigned. The name of the customer is entered for future telephone messages, credit verification, and personalized billing, etc.
4. Once the table is assigned and the customers seated, the waitress with a RED takes food and drink orders. These orders are keyed into the RED on its keyboard with appropriate control commands, and the RED instantly transmits the data through the air to the computer, as discussed above.



-13-

5. The computer sorts these orders and displays them at the appropriate terminals for food and beverage preparation. For instance, drink orders are displayed at the bar terminal 52 and food orders are displayed at the kitchen terminal 50.

6. Once food and/or drinks are ready, the cook and/or bartender would enter into the computer at their associated terminals the information that the orders are completed, and ready for pickup.

7. The computer then displays the completion status of the order on the display of the service terminal 54 to indicate that it is ready to be served.

8. After the order is served, the busboy enters this information into the computer 20 at the service terminal 54. The computer then transmits this information to the associated RED to alert the waitress for service or supervision.

9. The waitress may change the order or add new items on the order using appropriate RED commands at any time. In addition, take-out orders, room-service, delivery order entries are optional abilities of the system.

10. Final billing would then be initiated by the waitress using an appropriate command on the RED. The bill would then be computed by the computer. Billing is done by group or individually, and the bills are printed on the printer 42.

11. At this time pertinent data such as table number, waitress number, food order, etc. would be stored with the background record with date, time, etc., for order analysis, inventory management, etc, as illustrated in Fig. 9.

More specifically, the various input and communication display functions for these terminals and the like functions performed in association with these and other terminals, are illustrated in Fig. 8.



The initiating system, or background information permanently stored in the computer and used for the appropriate displays of the various terminals and used to generate other information necessary to automate the restaurant system, is shown in Fig. 9.

Based on the information and subsequently entered information the computer performs the following functions:

1. Interface with remote entry device (RED) via airway link.
2. Interface with CRT's printers, floppy and hard disc storage.
3. Store current order information for sorting, display etc. for each table in its allocated read/write buffer and all pickup/delivery information in a single allocated read/write buffer until a bill has been generated.
4. Prepare and store reservation information.
5. Store completed order information on disk (after bill generation) for reporting and analysis purposes.
6. Update table status.
7. Respond to RED requests such as RECALL or HELP.
8. Respond to CRT requests such as displays requested.
9. Respond to "accounting" requests such as report generations by way of the printer 42.
10. Initialize and edit user programmable data such menu item member and descriptions, menu item prices, selected reports to be generated, total no. of tables, etc.
11. Respond to display terminals, RED's and hardcopy terminal user errors.
12. Maintain system real time clock and calendar
13. Perform arithmetic functions for billing and reporting, etc.

-15-

CLAIMS

1. Apparatus for entry of data to a computer, comprising:

a portable, hand held, remote data entry device,
5 said remote entry device including

a keyboard for manual selection by an operator of data to be entered into the computer and

means responsive to activation of said keyboard
10 for air transmission of said selected data; and

interfacing means for coupling said air transmitted data to said computer, including

means associated with said computer for receiving said airwave transmitted data,

15 means for translating said received data into a form suitable for processing by said computer, and

means for providing said translated data to said computer.

2. The apparatus of claim 1 in which said computer
20 has a display terminal associated therewith for display of said translated data.

3. The apparatus of claim 1 in which said data is transmitted by radio waves.

4. The apparatus of claim 1 in which said computer
25 is a general purpose computer.

5. The apparatus of claim 1 in which said interfacing means includes means associated with said computer for air transmission of data generated by
said computer to said remote entry device,

30 and means associated with said remote entry device for receipt of said computer generated transmitted data.

6. The apparatus of claim 5 in which said computer generated data is transmitted on one frequency and
35 said data selected by said remote entry device is generated transmitted data.



-16-

7. The apparatus of claim 1 in which said remote entry device includes a memory for temporary storage of data selected at said keyboard prior to transmission thereof.

5 8. The apparatus of claim 1 in which said remote entry device includes means for providing a visual display of the information selected by the keyboard.

10 9. The apparatus of claim 1 in which said remote entry device includes a microprocessor which controls transmission of said selected data.

10. The apparatus of claim 1 including a plurality of additional remote entry devices substantially like said first mentioned remote entry device for communicating with said computer.

15 11. The apparatus of claim 10 in which said receiving means is equipped to receive air transmitted data from more than one of said remote entry devices, and said interfacing means includes means to translate received data and provide translations thereof to the
20 computer from more than one of said remote entry devices.

25 12. The apparatus of claim 11 including an additional interfacing means associated with said computer said first mentioned interfacing means interfacing with one of said remote entry devices and said additional interfacing means interfacing with another remote entry device but not with said one entry device.

30 13. The apparatus of claim 12 in which both said one interfacing means and said additional interfacing means interface with a plurality of remote entry devices, the plurality of remote entry devices associated with said one interfacing means being different from the plurality of remote entry devices associated with said additional interfacing means.

35 14. The apparatus of claim 1 including a modum for interfacing a telephone network with the computer.



-17-

15. The apparatus of claim 1 in which said data is digital in form.

5 16. The apparatus of claim 1 including an additional remote entry device substantially the same as said first mentioned remote entry device, and in which each of said remote entry devices includes means responsive to activation of its keyboard for transmission of an identification code uniquely associated therewith.

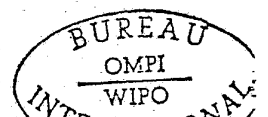
10 17. The apparatus of claim 1 in which said remote entry device includes means for transmitting blocks of said data asynchronously and said interfacing means includes means for asynchronously receiving said blocks of data.

15 18. The apparatus of claim 17 in which said data is transmitted in blocks of data with the start of each block of data being indicated by a start signal and the end of each block of data being indicated by a stop signal.

20 19. The apparatus of claim 18 in which said remote entry device includes means for generating a block of data indicative of the number of blocks of data transmitted, and said interfacing means includes means for comparing said number of blocks of data to the
25 number of blocks of data received to determine if the data has been correctly received.

30 20. The apparatus of claim 17 in which said remote entry device includes means for generating a parity block of data to make the total number of blocks of data to be either an even or an odd number.

35 21. The apparatus of claim 19 in which said interfacing means includes means for checking said block of data for proper parity, and means associated with the interfacing means responsive to said parity checking means for transmitting a signal to said remote entry device



-18-

to retransmit the blocks of data in the event of improper parity.

22. The apparatus of claim 1 including an additional remote entry device and in which each of said remote entry devices includes means for transmitting an identification code, associated therewith said interfacing means including means for recognizing the identification code of one of said remote entry devices and

10 means for preventing the provision of data from either of said remote entry devices in response to prior recognition of the identification code of the other remote entry device.

23. The apparatus of claim 1 in which said remote entry device includes means for transmitting an identification number associated therewith at the end of transmission of a set of data to indicate end of transmission.

24. The apparatus of claim 1 in which said interfacing means includes

20 means for airwave transmitting data to said remote entry device at a frequency differing from the frequency at which said remote entry device transmits data to said receiving means, and including

25 means for periodically reversing the transmission frequencies between said remote entry device and said interfacing means.

25. The apparatus of claim 1 including means coupled with said computer for visually displaying the translated data from said remote entry device.

26. The apparatus of claim 25 in which said visual displaying means includes at least one CRT display.

27. The apparatus of claim 25 in which said visual displaying means includes at least one printer.



-19-

28. The apparatus of claim 1 in which said air transmission means includes means for transmitting a UHF low-power radio signal.

5 29. The apparatus of claim 1 in which said air transmission means includes means for transmitting data via light waves.

30. The apparatus of claim 1 in which said data is encoded in binary form.

10 31. The apparatus of claim 1 in which said keyboard activation responsive means includes a micro-processor.

32. The apparatus of claim 1 in which said keyboard includes means indicating association of particular keys with particular items of a restaurant menu.

15 33. The apparatus of claim 1 in which communication is established and maintained between the remote entry device and said computer in accordance with the method shown in Fig. 5.

20 34. The apparatus of claim 1 in which communication between the remote entry device and the computer is established in accordance with the method illustrated in Fig. 6.

25 35. The apparatus of claim 1 in which said remote entry device transmits information relating to reservations and including means associated with said computer for displaying said reservation information in a selected format.

30 36. The apparatus of claim 35 in which said reservation information display means includes means for displaying information relating to one or more of table number, capacity, time period and table status for plural tables of a restaurant.

35 37. The apparatus of claim 1 including a printer for printing bills in a selected billing format based at least in part on data transmitted by said remote entry device.



-20-

38. The apparatus of claim 1 in which said remote entry device includes means for transmitting data relating to food orders, and including means for displaying information relating to food orders based in part upon said transmitted food order data.

39. The apparatus of claim 38 in which said computer includes means for analyzing the data relating to food orders transmitted by said remote entry device and causing said displaying means to display the results of such analysis.

40. The apparatus of claim 1 in which said remote entry device includes means for transmitting data relating to drink orders, and including display means coupled with said computer for displaying information relating to said transmitted drink order data.

41. The apparatus of claim 1 including means coupled with said computer for displaying data relating to one or more of orders ready to be served, table numbers and tables ready to be cleared.

42. The apparatus of claim 1 in which said remote entry device includes means for receiving transmitted data originated from said computer, and means for visually displaying said information.

43. The apparatus of claim 1 in which said computer comprises a general purpose computer with a permanently stored program control system for recording and transmitting information relating to operations of a restaurant.

44. The apparatus of claim 1 including means for storing data used with said computer, said storing means including one or more of floppy disk and hard disk memory elements.

45. The apparatus of claim 1 including means coupled with said computer for displaying information based at least in part upon the information transmitted by said remote entry device.



-21-

46. The apparatus of claim 1 including another remote entry above substantially like the past mentioned remote entry device,

5 means associated with each remote entry device for transmitting an identification code associated therewith;

means associated with such computer for generating an enable signal to one of said remote entry devices in response to receipt of its code; and

10 means associated with the other remote entry device for disabling it from transmitting data to the computer in response to receipt of the code of the other remote entry device.

15 47. The apparatus of claim 1 in which the keyboard of said remote entry device terminal has means manually actuatable for transmitting data representing selection of a food item.

48. The apparatus of claim 47 including means associated with said computer for displaying the food selection.

20 49. The apparatus of Claim 1 in which said remote input terminal has means manually actuatable for indicating selection of a given inventoried item.

25 50. A computerized restaurant system, comprising:
a computer;
a remote data input terminal for transmitting data to said computer relating to food selection;
means responsive to said computer and said food selection data received thereby for displaying said selection.

30 51. The system of Claim 50 including manually actuatable means located remote from said data input terminal for providing an indication to the computer that said selected food item is ready to be served.

35



-22-

52. A restaurant communication system comprising:
a computer;
a remote data entry unit to enter customers food orders
to the computer;

5 a kitchen terminal responsive to said computer for
displaying said food orders.

53. The system of claim 52 in which said kitchen terminal includes means actuatable to indicate to the computer that the selected food order is completed and ready to serve.

10 54. The system of claim 52 including a busboy terminal responsive to said computer to display when said selected food orders are completed.

55. The system of claim 52 including a reservation input/output display terminal responsive to the computer
15 for displaying table reservation information.

56. The system of claim 55 in which said reservation terminal includes means actuatable for providing table selection information to the computer.

57. The system of claim 55 in which said reservation terminal includes a table layout and means associated with
20 said layout for providing and receiving said table selection data.

58. A reservation input/output display terminal for a computer, comprising:

25 a multiple element display of a table layout with each element corresponding to a different table;

means associated with each element for displaying data relating to the corresponding table.

59. The terminal of claim 58 in which said data includes
30 table reservation information.

60. The terminal of claim 58 in which said displayed data includes table occupation information.

61. The terminal of claim 58 in which said data includes
35 telephone message information.



AMENDED CLAIMS

[received by the International Bureau on 29 October 1982 (29.20.82);
typographical errors in claims 1, 5, 21, 23, 27 and 50 corrected;
claims 58 and 59 amended]

1. Apparatus for entry of data to a computer,
comprising:

a portable, hand held, remote data entry device,
said remote entry device including

5 a keyboard for manual selection by an
operator of data to be entered into the computer;

means responsive to activation of said keyboard
for air transmission of said selected data; and

10 interfacing means for coupling said air transmitted
data to said computer, including

means associated with said computer for receiv-
ing said airwave transmitted data,

means for translating said received data into a
form suitable for processing by said computer, and

15 means for providing said translated data to
said computer.

2. The apparatus of claim 1 in which said computer
has a display terminal associated therewith for display
of said translated data.

20 3. The apparatus of claim 1 in which said data is
transmitted by radio waves.

4. The apparatus of claim 1 in which said computer
is a general purpose computer.

25 5. The apparatus of claim 1 in which said inter-
facing means includes means associated with said
computer for air transmission of data generated by
said computer to said remote entry device, and

30 means associated with said remote entry
device for receipt of said computer generated trans-
mitted data.

6. The apparatus of claim 5 in which said computer
generated data is transmitted on one frequency and
said data selected by said remote entry device is gen-
erated transmitted data.

35



to retransmit the blocks of data in the event of improper parity.

22. The apparatus of claim 1 including
an additional remote entry device and in which
5 each of said remote entry devices includes means for
transmitting an identification code, associated
therewith said interfacing means including means for
recognizing the identification code of one of said
remote entry devices and

10 means for preventing the provision of data
from either of said remote entry devices in response
to prior recognition of the identification code of the
other remote entry device.

23. The apparatus of claim 1 in which said remote
15 entry device includes means for transmitting an
identification number associated therewith at the
end of transmission of a set of data to indicate end
of transmission.

24. The apparatus of claim 1 in which said inter-
20 facing means includes

means for airwave transmitting data to said
remote entry device at a frequency differing from the
frequency at which said remote entry device transmits
data to said receiving means, and including

25 means for periodically reversing the
transmission frequencies between said remote entry
device and said interfacing means.

25. The apparatus of claim 1 including means
coupled with said computer for visually displaying
30 the translated data from said remote entry device.

26. The apparatus of claim 25 in which said
visual displaying means includes at least one CRT
display.

27. The apparatus of claim 25 in which said
35 visual displaying means includes at least one printer.



46. The apparatus of claim 1 including another remote entry device substantially the same as said first mentioned remote entry device,

5 means associated with each remote entry device for transmitting an identification code associated therewith;

means associated with such computer for generating an enable signal to one of said remote entry devices in response to receipt of its code; and

10 means associated with the other remote entry device for disabling it from transmitting data to the computer in response to receipt of the code of the other remote entry device.

47. The apparatus of claim 1 in which the keyboard of said remote entry device terminal has means manually actuable for transmitting data representing selection of a food item.

48. The apparatus of claim 47 including means associated with said computer for displaying the food selection.

49. The apparatus of claim 1 in which said remote input terminal has means manually actuable for indicating selection of a given inventoried item.

50. A computerized restaurant system, comprising:
a computer;

25 a remote data input terminal for transmitting data to said computer relating to food selection; and

means responsive to said computer and said food selection data received thereby for displaying said selection.

51. The system of claim 50 including manually actuable means located remote from said data input terminal for providing an indication to the computer that said selected food item is ready to be served.



52. A restaurant communication system comprising:
a computer;
a remote data entry unit to enter customers food
orders to the computer;

5 a kitchen terminal responsive to said computer for
displaying said food orders.

53. The system of claim 52 in which said kitchen
terminal includes means actuatable to indicate to the computer
that the selected food order is completed and ready to serve.

10 54. The system of claim 52 including a busboy terminal
responsive to said computer to display when said selected
food orders are completed.

55. The system of claim 52 including a reservation
input/output display terminal responsive to the computer
for displaying table reservation information.

15 56. The system of claim 55 in which said reservation
terminal includes means actuatable for providing table
selection information to the computer.

20 57. The system of claim 55 in which said reservation
terminal includes a table layout and means associated with
said layout for providing and receiving said table selection
data.

58. A reservation input/output display terminal for
a computer, comprising:

25 a multiple element display of a table layout with each
element corresponding to a different table;
means associated with each element for displaying
table reservation information relating to the corresponding
table.

30 59. The terminal of claim 58 in which said table
reservation information includes the reservation time.

60. The terminal of claim 58 in which said displayed
data includes table occupation information.

35 61. The terminal of claim 58 in which said data includes
telephone message information.



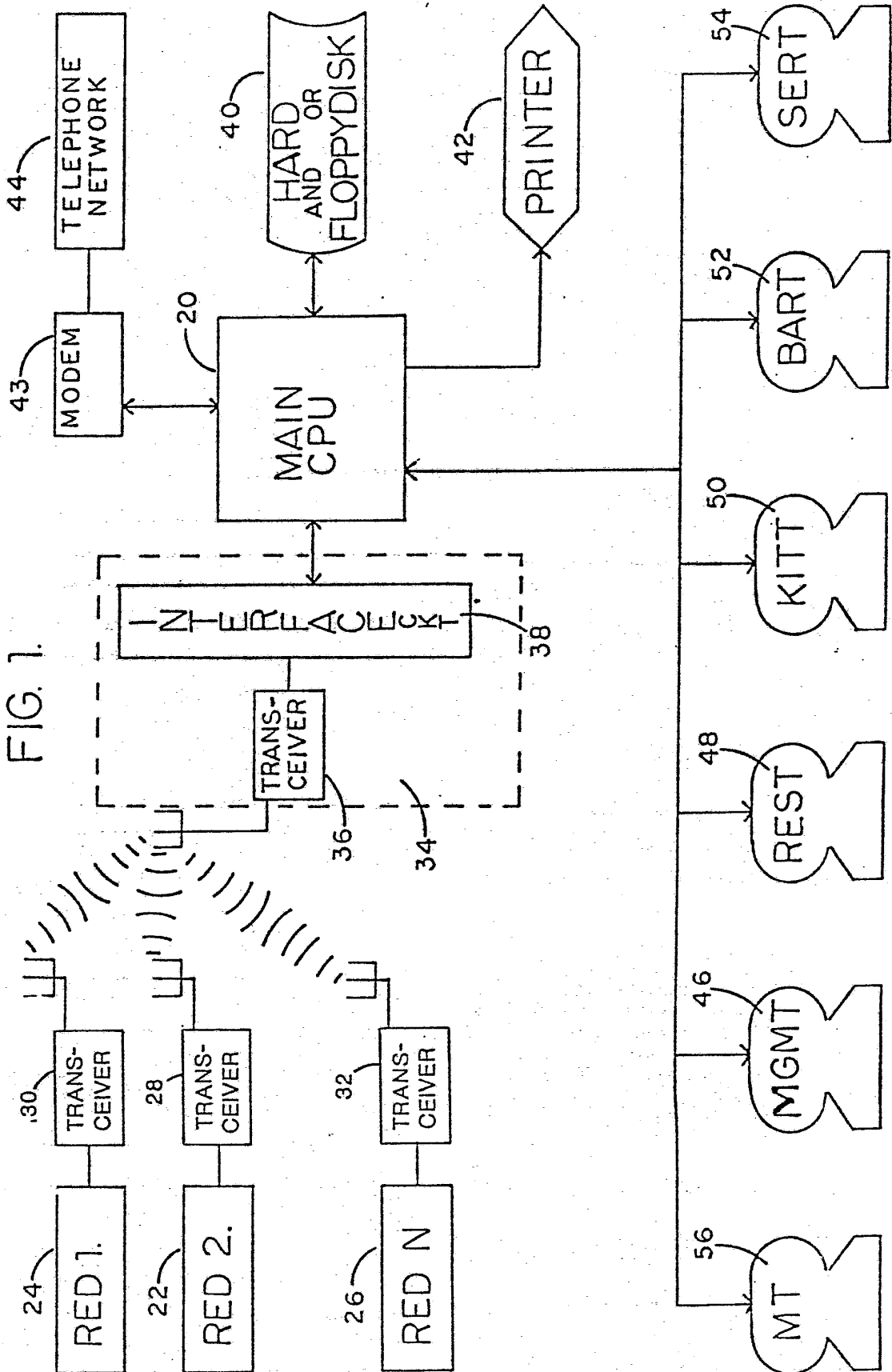


FIG. 2.

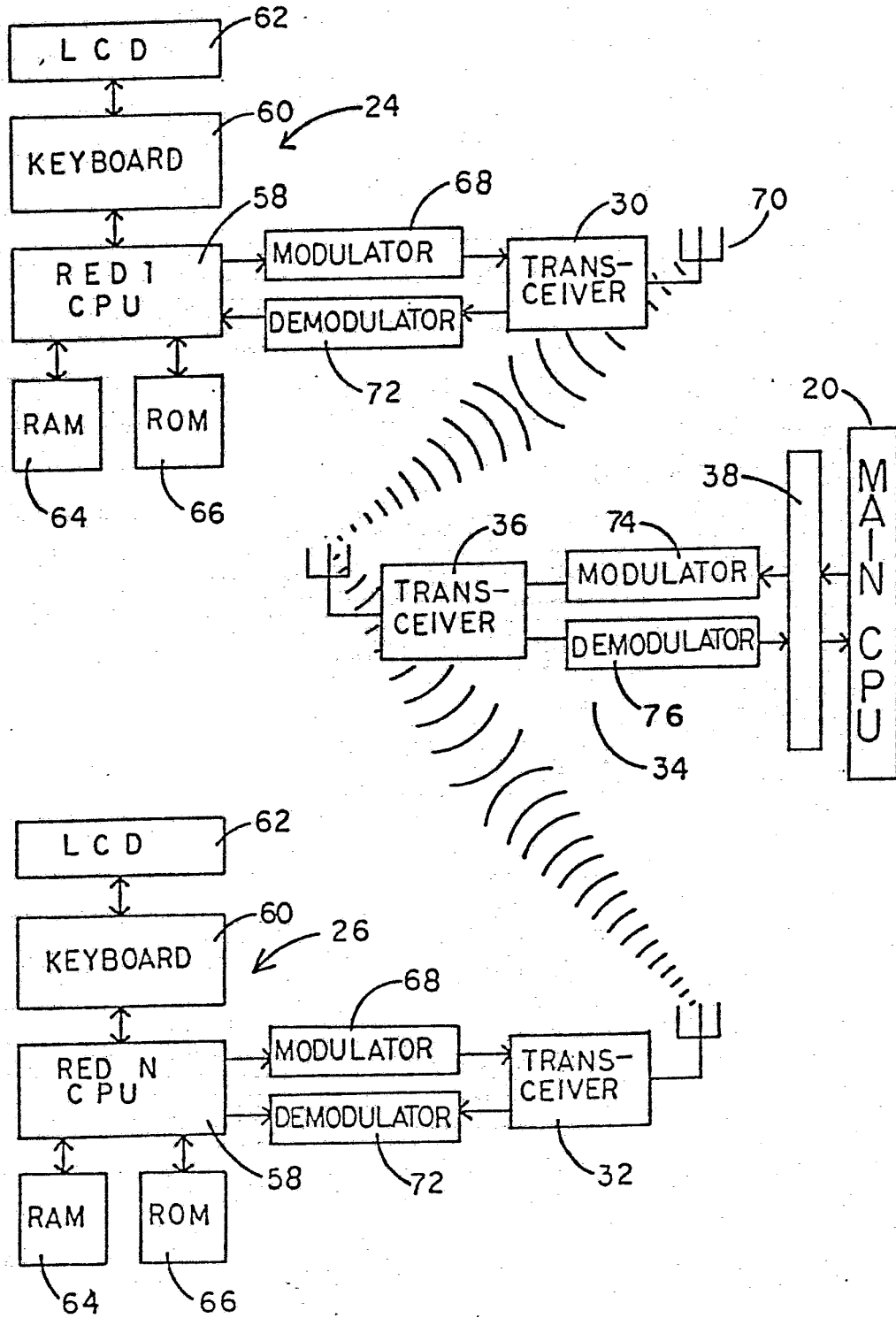
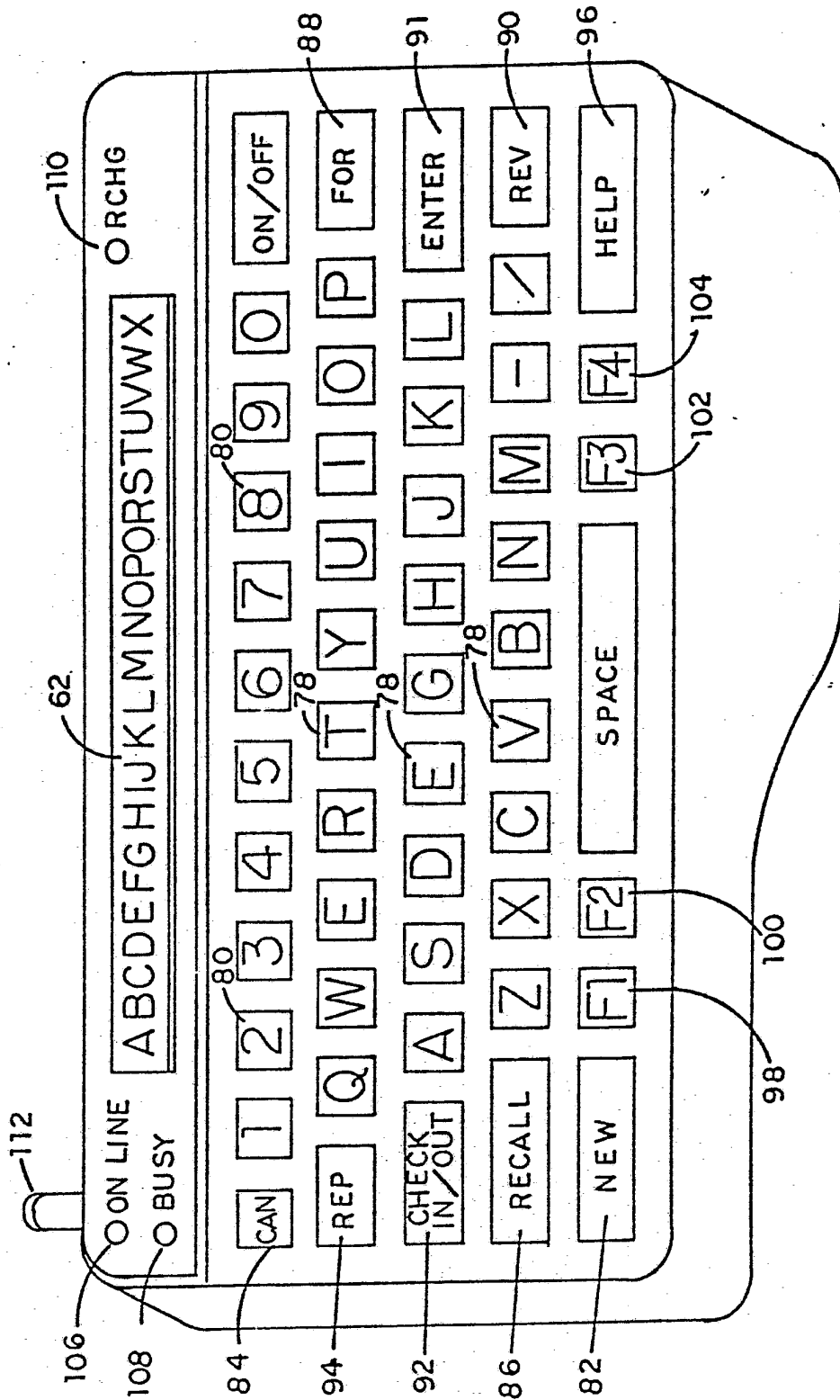


FIG. 3.



SUBSTITUTE SHEET



FIG. 4.

STP	P	I.D.#	STR
STR		I D#	P STR
STP	P	I.D.#	STR
STP	P	DATA	STR
STP	P	DATA	STR
STP	P	DATA	STR
STP	P	BLOCK PARITY	STR
STP	P	I.D.#	STR
STR		RETRANSMIT CODE	P STR
OR			
STR		RELEASE CODE	P STR

STP		I.D.#	P STR
STP		DATA	P STR
STP		DATA	P STR
STP		DATA	P STR
STP		BLOCK CODE	P STR
STP		I.D.#	P STR

FIG. 5.

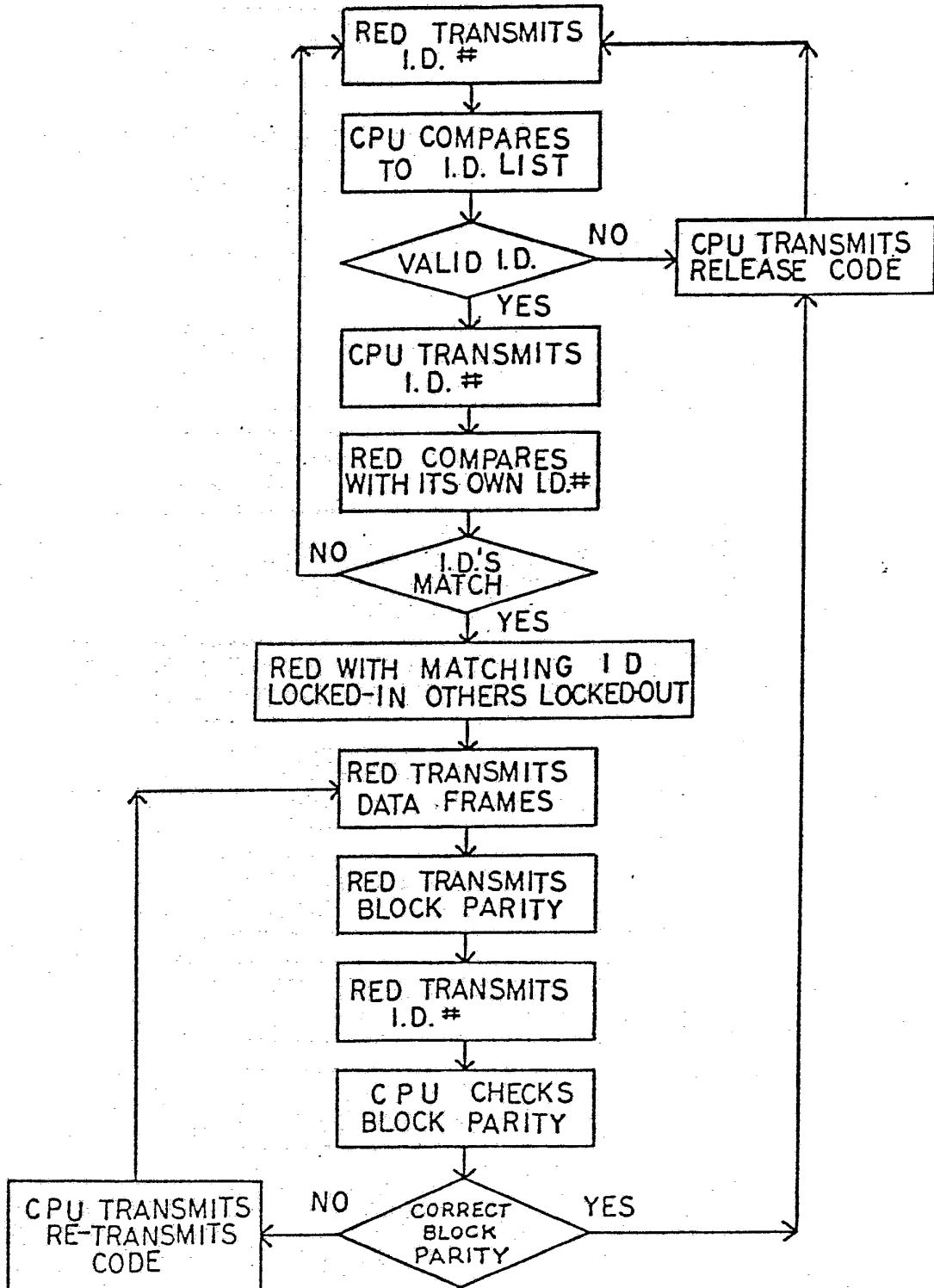
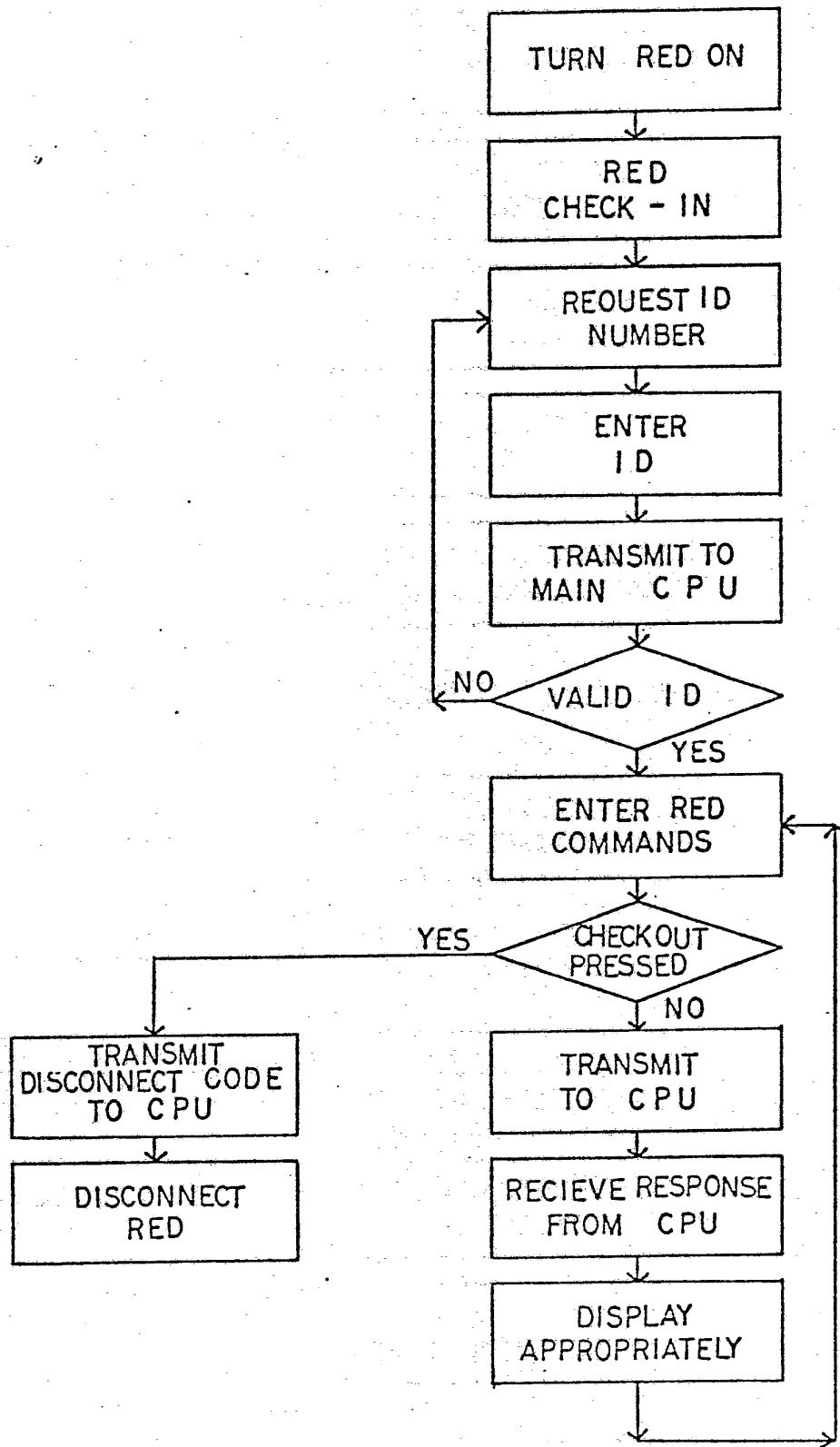
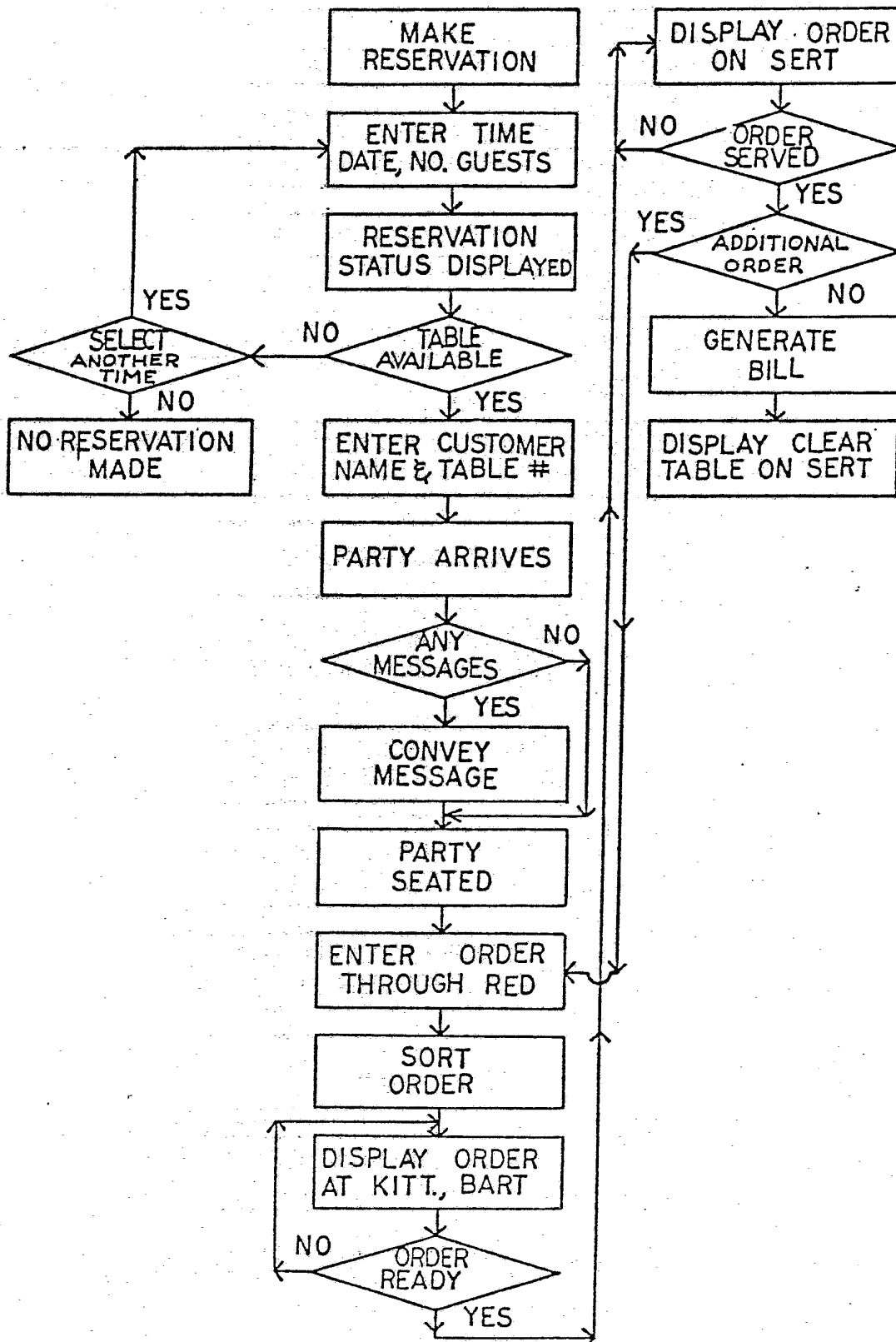


FIG. 6.



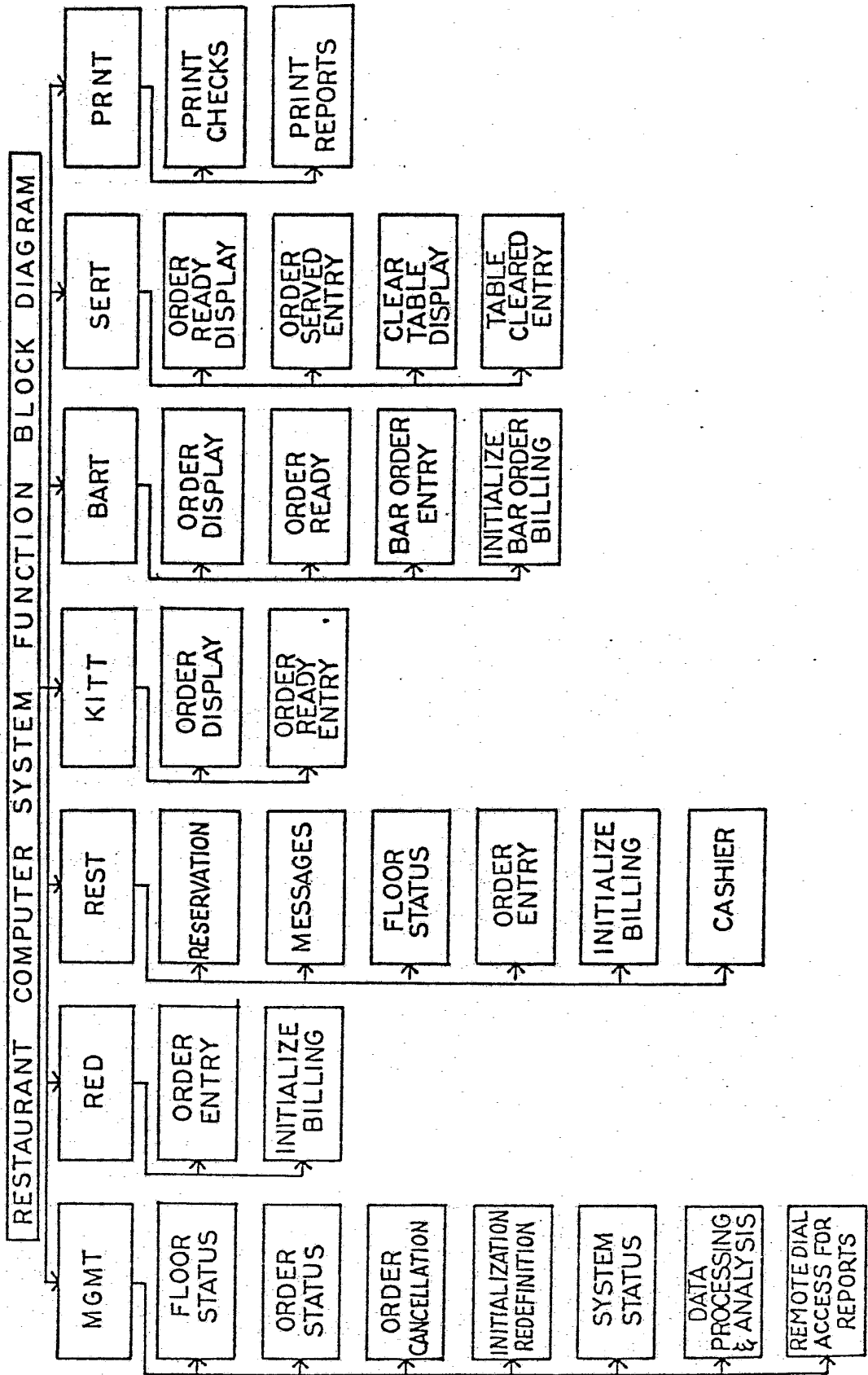
7/18

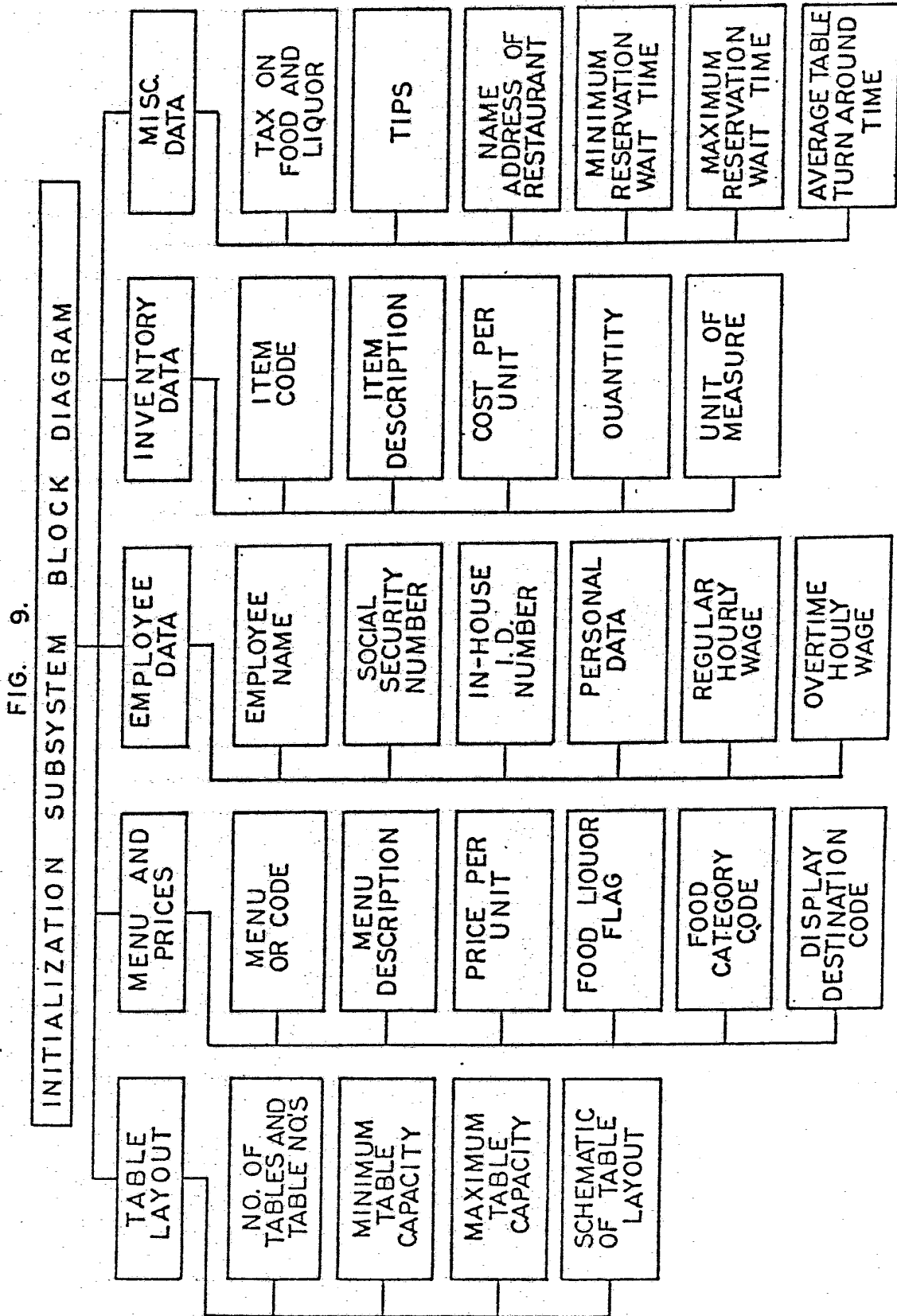
FIG. 7.



8/18

FIG. 8.





10/18

FIG. 10.

FLOOR STATUS			
<u>TABLE STATUS</u>	<u>TABLE STATUS</u>	<u>TABLE STATUS</u>	<u>TABLE STATUS</u>
1 0			
2 01234			
3 012			
4 0123456789			
5 0			
6 0123456			
7 01			
8 012345			
USER COMMAND			12/10/82 12:50P



FIG. 11.

ORDERS TO BE SERVED				ORDERS TO BE CLEARED				
NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	NO. PRIORITY	
1 18	9	17	1	8	17	2 3	10	18
2 10	10	18	2 10	14	19	3 10	11	19
3 10	11	19	3 10	19	20	4 25	12	20
4 25	12	20	4 25	12	21	5 11	13	21
5 11	13	21	5 11	13	22	6	14	22
6	14	22	6	14	23	7	15	23
7	15	23	7	15	24	8	16	24
8	16	24	8	16				
NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY	NO PRIORITY
25	33	41	25	33	41	26	33	41
26			27			28		
27			28			29		
28			29			30		
29			30			31		
30			31			32		
31			32					
32	40	48	32	40	48			
USER COMMAND				12/10/82 12:40 P				

12/18

FIG. 12.

RESERVATION STATUS			
TABLE:1 CAP:6 6:30 P - 7:30 P 8:00 P - 9:00 P	TABLE:2 CAP:10 7:15 P - 8:00 P	TABLE:3 CAP:4	TABLE:4 CAP:2
TABLE:5 CAP:6 7:00 P - 8:00 P 9:00 P - 10:00 P	TABLE:6 CAP:5	TABLE:7 CAP:6	TABLE:8 CAP:4 7:00 P - 8:00 P
TABLE:9 CAP:4	TABLE:10 CAP:12	TABLE:11 CAP:6 6:00 P - 7:00 P	TABLE:12 CAP:6 6:30 P - 7:30 P
TABLE:13 CAP:2 9:00 P - 9:45 P	TABLE:14 CAP:2	TABLE:15 CAP:4 8:00 P - 9:00 P	TABLE:16 CAP:4
TABLE:17 CAP:10	TABLE:18 CAP:10	TABLE:19 CAP:6	TABLE:20 CAP:6
USER COMMAND			12/10/82 12:40 P



FIG. 13.A

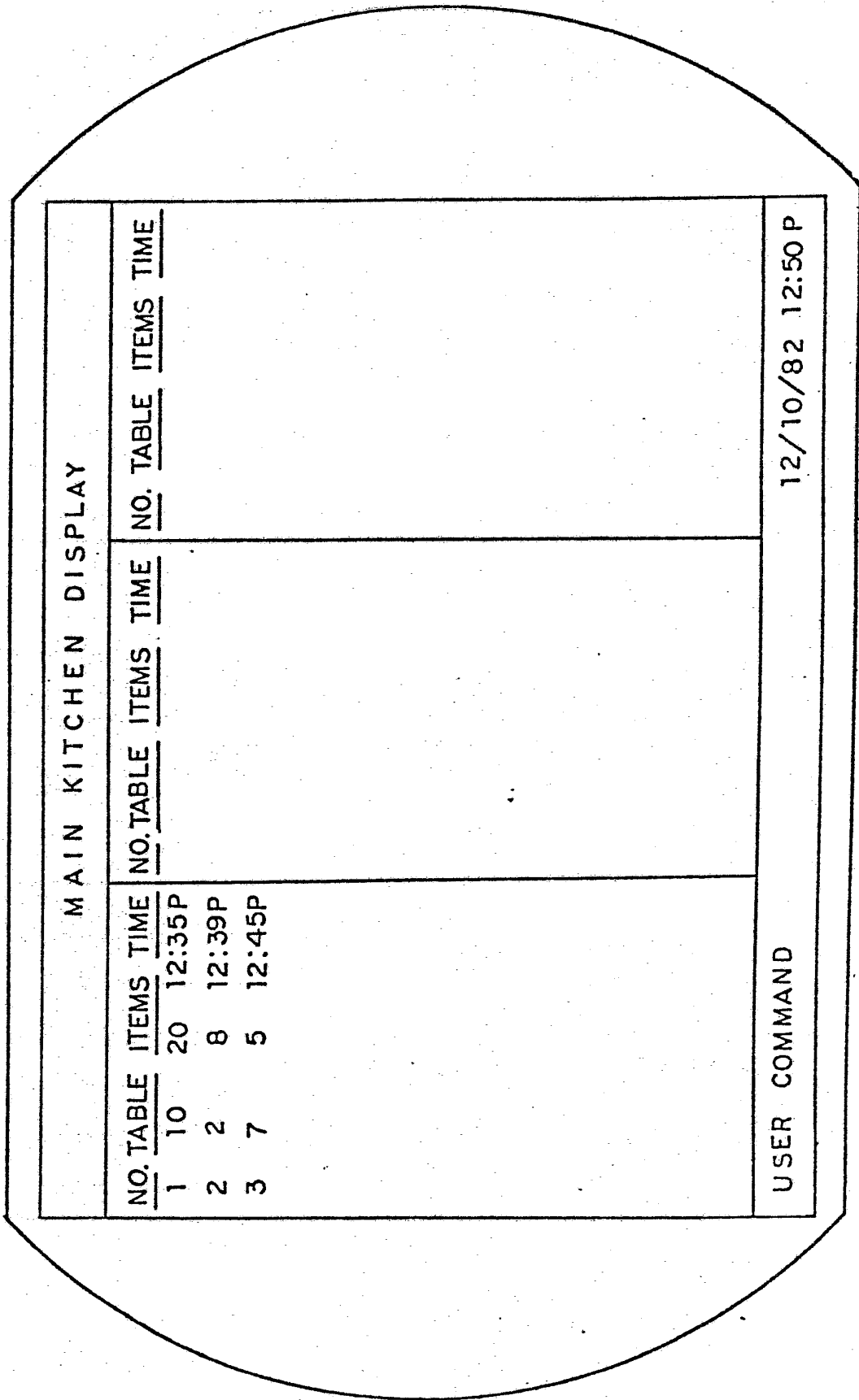


FIG. 13.B

KITCHEN DISPLAY BY ORDER			
TABLE: 12 TABLE: 12:50A			
<u>NO. QUAN.</u>	<u>DESCRIPTION</u>	<u>SPEC. INST.</u>	<u>NO. QUAN.</u>
1	2	NEW YORK STEAK MED RARE	<u>DESCRIPTION</u>
2	1	CHICKEN KIEV	<u>SPEC. INST.</u>
USER COMMAND		12/10/82 12:55P	



FIG. 13.C

KITCHEN DISPLAY BY ITEM		
<u>APPETIZERS</u> QUAN DESCRIPTION 10 JULIAN SALAD 3 MINESTRONE SOUP	<u>ENTREE'S</u> QUAN DESCRIPTION 10 NEW YORK STEAK 5 LASAGNA	<u>DESSERTS</u> QUAN DESCRIPTION 5 CHOCALATE MOOSE 3 APPLE PIE
USER COMMAND		12/10/82 12:50 P



FIG. 14.A

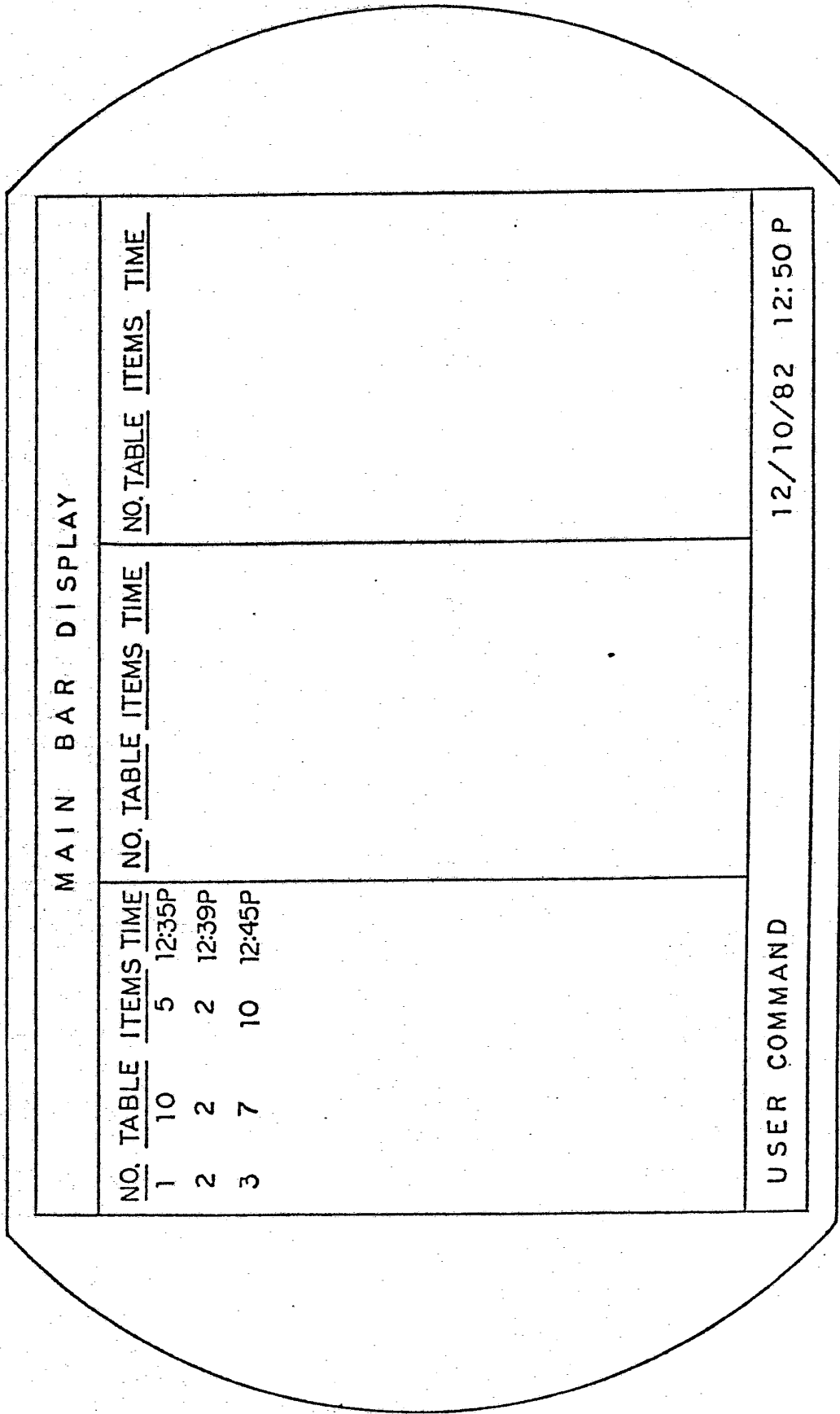


FIG. 14.B

BAR DISPLAY BY ORDER			
TABLE:12		TIME : 12:50 A	
<u>NO. QUAN.</u>	<u>DESCRIPTION</u>	<u>SPEC. INST.</u>	<u>NO. QUAN.</u>
1	2	JOHNNY WALKER NO ICE	<u>DESCRIPTION</u>
2	1	PINA COLADA	<u>SPEC. INST.</u>
3	5	COCA COLA	
USER COMMAND			12/10/82 12:55 P



FIG. 14.C

BAR DISPLAY BY ITEM		
<u>SOFT DRINKS</u> <u>QUAN DESCRIPTION</u> 5 COCA COLA LARGE 2 7-UP MED	<u>MIXED DRINKS</u> <u>QUAN DESCRIPTION</u> 1 PINA COLADA	<u>HARD DRINKS</u> <u>QUAN DESCRIPTION</u> 2 JOHNNY WALKER
USER COMMAND		12/10/82 12:50 P



INTERNATIONAL SEARCH REPORT

International Application No PCT/US82/00701

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC		
U.S. CL. 364/900 INT. CL. ³ G06F 15/21, 3/02		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	364/200,900 340/825.28, 825.29, 825.35	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category [*]	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US,A, 3,899,775 Published 12 August 1975, Larsen	1,2,4,6-22, 25-27,30-54
X	US,A, 4,007,443 Published 08 February 1977, Bromberg et al	1,3,5,35,38, 40,42,47,49
X	US,A, 4,222,111 Published 09 September 1980, Sloan et al	55-61
A	US,A, 4,019,174 Published 19 April 1977, Vanderpool et al	1-61
A	US,A, 4,090,247 Published 16 May 1978, Martin	1-61
A	US,A, 3,956,740 Published 11 May 1976, Jones et al	1-61
A	US,A, 3,688,276 Published 29 August 1972, Quinn	1-61
A	US,A, 3,267,436 Published 16 August 1966, Alpert et al	1-61
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²	Date of Mailing of this International Search Report ²	
14 September 1982	22 SEP 1982	
International Searching Authority ¹	Signature of Authorized Officer ²⁰	
ISA/US	<i>James M. Heller</i>	