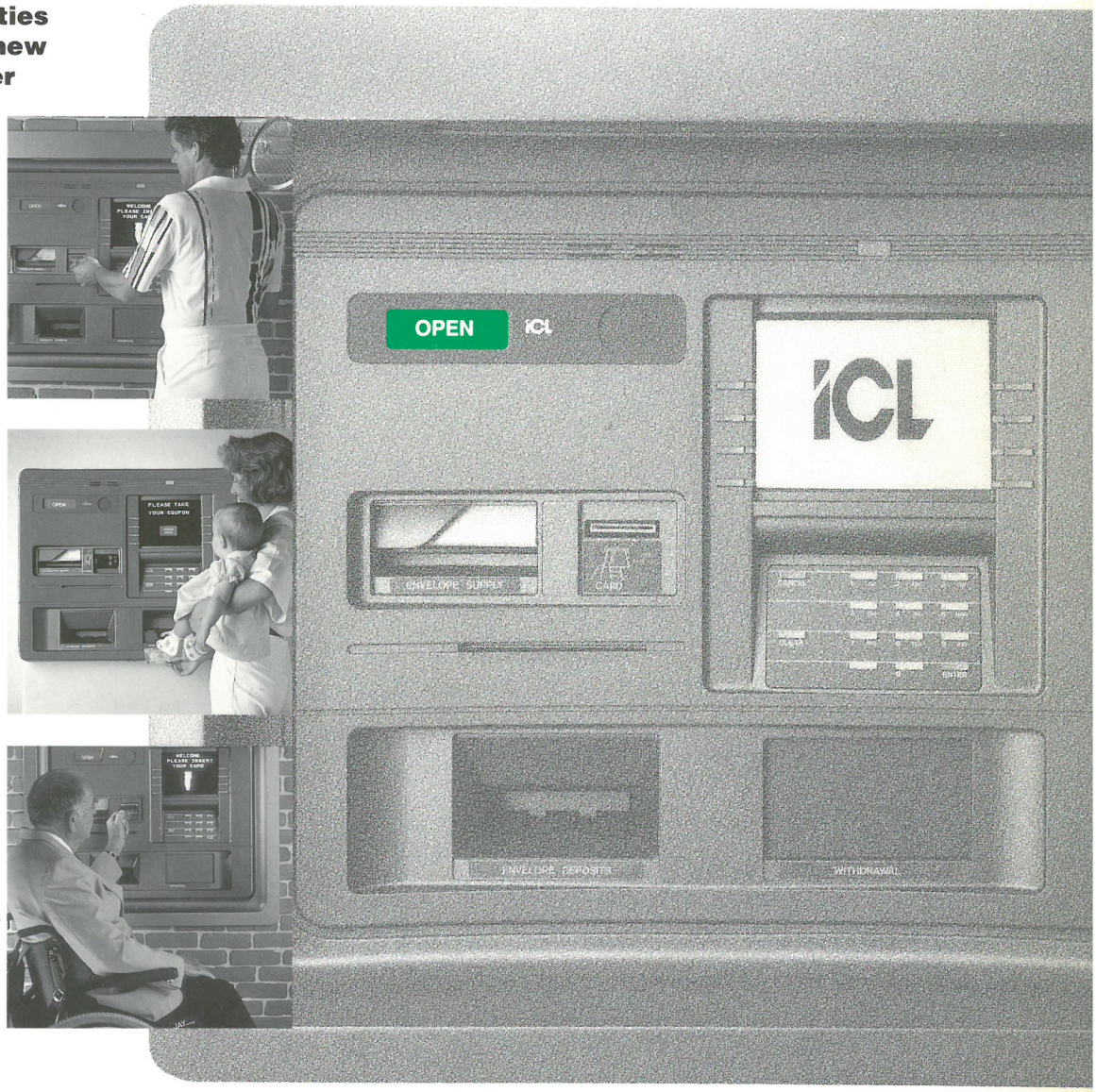
SERIES 7000 ATMs

TECHNICAL OVERVIEW

Meeting the opportunities of self-service with a new generation of customer banking systems.



ICL

Contents

Introduction 1

This document is intended to provide representatives of financial institutions with a technical overview of the ICL Series 7000 Automated Teller Machine (ATM).

Introducing the ICL Series 7000 ATM

The ICL Series 7000 is a fourth-generation family of full-service ATMs that offers customers a variety of financial services without assistance from a cashier.

Figure 1 shows an example ATM from the ICL Series 7000. There are three models in the range:

- Model 7010 is a free standing, lobby model ATM, serviced from the front
- Model 7020 is a free standing, lobby model ATM, serviced from the rear
- Model 7040 is an ATM with a large capacity safe, installed through the wall and serviced from the rear

Distinctive features of the ICL Series 7000 are:

- Design that accommodates wheelchair access
- Braille characters embossed below each key on the customer keypad and on the fascia. These identify where the customer inserts the card and envelopes and the note dispensing slot
- A 13 inch, EGA compatible, colour customer screen for easy viewing
- Either a motorised or a dip card reader
- The use of the Electronic Journal option as an alternative to or in addition to a printed journal
- A single printer for receipts and statements
- Fully automatic, self-loading paper supply for receipt and statement printer
- Automatic loading of backup paper roll for the receipt and statement printer. This eliminates paper waste and reduces the need for service calls
- Industry standard hardware and software architecture, including a 12 MHz, 80286 main processor and Microsoft* OS/2 (MS* OS/2) operating system

Convenient to use services are available to customers 24 hours a day with the ICL Series 7000. They include:

- Cash withdrawals
- Deposits
- Transfer of funds between accounts
- Balance of account enquiries
- Non-currency dispensing
- Statement printing

High performance hardware and efficient software make the ICL Series 7000 ATMs highly reliable. This minimises maintenance costs and unscheduled service calls, leading to a lower cost of ownership of the ATM.

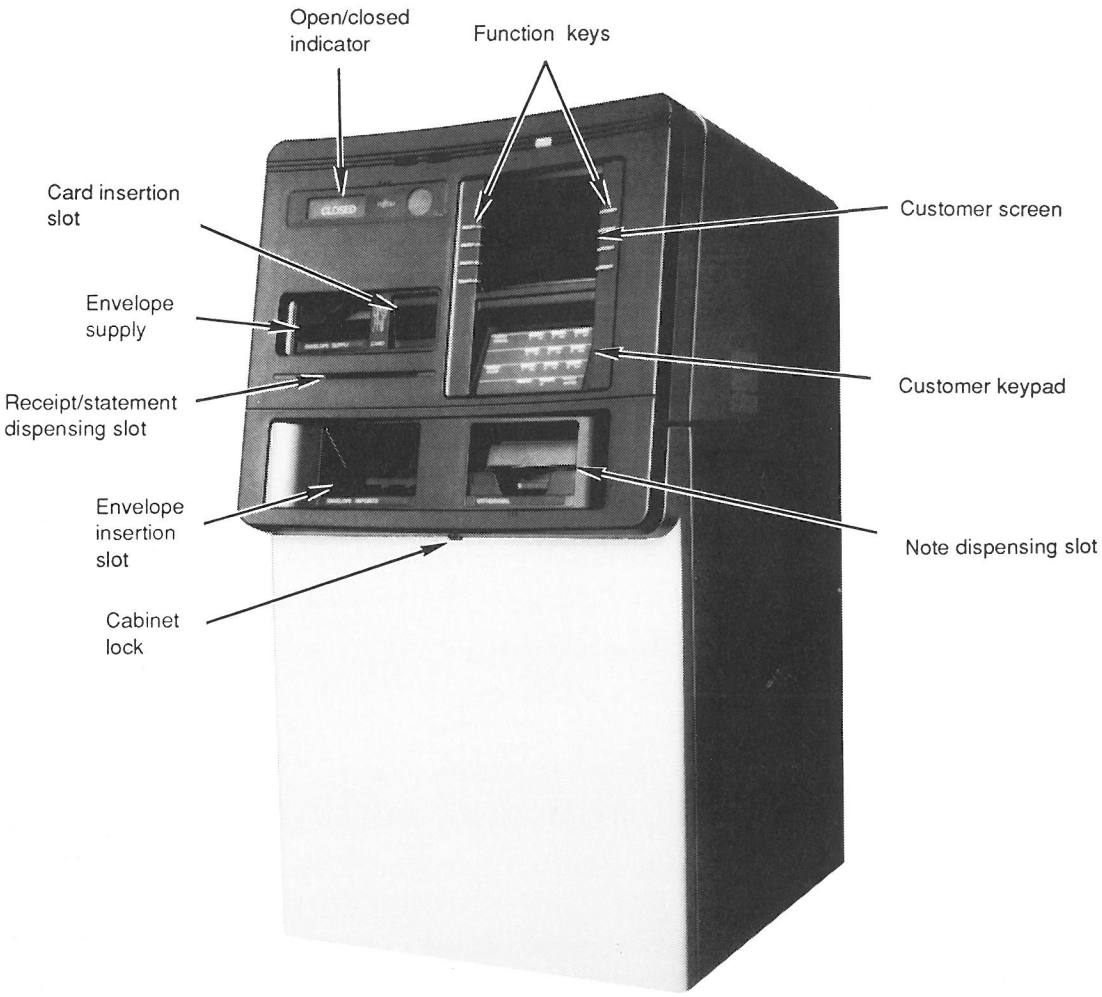


Figure 1 ICL Series 7000 ATM (lobby model)

Customer oriented design features

Several design features help customers complete transactions quickly, easily and accurately:

- **Programmable display**
  The 13 inch colour customer screen displays messages to help customers perform transactions. You can tailor messages, graphics and animation displays to match the requirements of your financial institution
- **Customer keypad**
  The keypad is easy to use. It readily accommodates long fingernails and braille characters below each key provide better accessibility to blind customers

- **Function keys**
  The eight keys that border the display screen are particularly helpful in simplifying customer use. You can use application programs to assign functions to these keys and display messages that tell a customer how to use them to choose a transaction type, select an amount, or give other instructions to the system. The function keys are wrap-around keys which help to minimise parallax problems
- **Statement printing**
  You can offer your customers the option of printing their account statements directly at the ICL Series 7000 ATM
- **Privacy shield**
  An optional filter for the customer screen limits onlookers' view of displayed information to keep the customer's data confidential
- **Voice guidance**
  This option offers recorded messages to help customers use the ATM

Service and maintenance features

All the components inside the cabinet of an ICL Series 7000 ATM are readily accessible to the operator after the cabinet door is opened. Individual modules, which are on rails, can be pulled forward for routine maintenance, such as replenishing supplies and cleaning.

Security

Several protective and reporting devices provide security:

- A safe to protect the note dispenser and envelope depository. The safe door has an alarm switch and an alarm grid covers the interior surfaces. A duress alarm can supplement the key and combination lock on the safe door
- Two different key locks on each cash cassette give you the option of setting the locks so that two people must be present when opening a cassette
- Optional lockable card capture boxes (for retained cards) and envelope depository bins
- An interface for connecting a surveillance camera
- Password protection provides additional security, to prevent unauthorised people from performing certain maintenance functions. Initially, no passwords are required. After software is loaded, supervisory or security personnel can activate password control and set passwords
- A journal to log events that can affect ATM security
- Electronically controlled environmental doors are standard with model 7040, to protect the envelope insertion and note dispensing slots

The *Security devices* section on page 11 describes this equipment in detail. For more information on password protection, see the *Password change* section on page 16.

Hardware 2

This section describes the standard and optional ICL Series 7000 hardware components. Appendix A gives details of which components are standard and which are optional.

Display screens

A 13 inch, EGA compatible colour customer screen displays programmable messages and graphics to help customers to perform their transactions. The screen can display up to 16 lines of 32 characters or 20 lines of 40 characters (depending on the font size) and up to 16 colours from a 64 colour palette. ICL can supply an optional privacy shield over the display screen which limits the view of displayed information keeping the customer's data confidential.

You can program the screen to display special effects including:

- Customised logos and message displays using proportional or fixed character fonts in various sizes
- Icons from standard drawing programs, including programs that support scanner input
- Animated graphics

The ICL Series 7000 ATMs provide the following graphics features:

- **Smooth scrolling**
  Vertical scrolling is by pixel instead of character incrementing (by column or row)
- **Venetian-blind effect**
  The display area appears as horizontal bars that open or change from black to a colour specified by you to reveal the display
- **Zoom effect**
  The dark border of the display area grows larger as it moves inward. When the inward movement ends, a small area in the centre of the customer screen remains and displays significant data
- **Windowing effect**
  Borders are drawn around data that can be grouped in various areas on the display
- **Icon animation**
  Icons can move vertically or horizontally at various speeds

On a rear-serviced ATM, a 9 inch screen inside the rear of the cabinet displays messages to guide operators in performing maintenance and test functions. The screen can display up to 25 lines of 80 characters each. Operator displays for a front-serviced ATM appear on the customer screen, also in a 25 line by 80 character format.

Customer keypad

The customer keypad, shown in Figure 2, has 14 keys with the braille equivalent below each key. Customers use the keys to enter personal identification numbers (PINs), transaction amounts and other information needed to complete a transaction. When pressed, the keys give audible feedback.

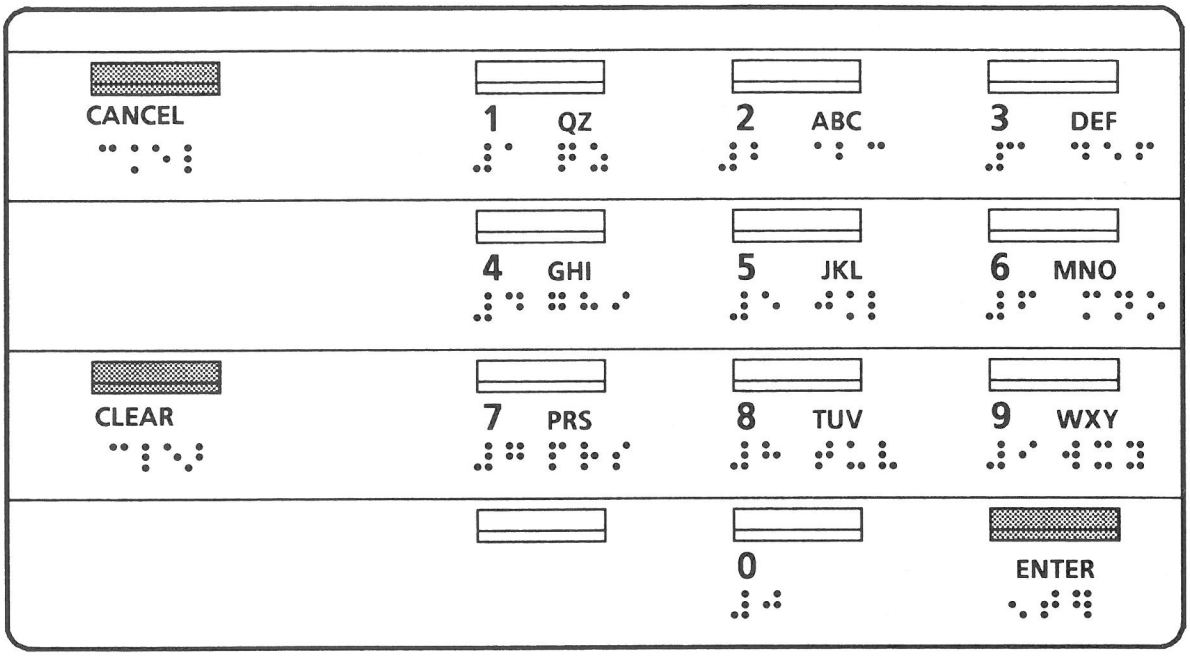


Figure 2 ICL Series 7000 customer keypad

Function keys

There are four function keys on each side of the customer screen. The customer uses these keys to select transactions such as Withdrawal, Deposit, Balance Enquiry, or Transfer, depending on the menu displayed. When the system prompts for the transaction to begin, the customer presses the key next to the menu line that displays the required transaction. While a transaction is in process, additional menus offer choices of amounts and other options. When pressed, the keys give audible feedback.

Card reader/writer

The ICL Series 7000 ATMs support the following card readers/writers:

- Track 2 motorised card reader (standard)
- Tracks 1, 2 and 3 motorised card reader/writer
- Tracks 1 and 2 dip card reader

The **motorised card reader** (and optional writer) has a card transport mechanism and magnetic read/write heads for reading from and writing to the customer's encoded plastic card. To start a financial transaction, the customer inserts the card into the card slot. A shutter with a pre-sensor head prevents customers from inserting foreign objects; electronic sensors monitor card movement. On command from the host computer, the ATM retains invalid, expired or forgotten cards in a tray behind the card reader/writer. A secure card capture box, with a key lock and a 30 card capacity, is optional.

The **dip card reader** has magnetic read heads for reading encoded plastic cards. To start a financial transaction, the customer dips the card into the card slot; when the transaction is complete, the customer removes the card. Because the customer retains control of the card, a card capture box is not necessary.

Note dispenser

For each ICL Series 7000 model the standard note dispenser has two cash cassettes. Third and fourth cassettes are optional. An engineer can add cassettes to the note dispenser (up to the allowable maximum) on site if you need more capacity after the ATM has been installed.

A cassette can hold up to 3,000 new or 2,500 old ATM-fit notes. Guides inside the cassette are adjustable for different currency sizes or for other media, such as coupons or traveller's cheques. For greater security, two different keys are required to unlock a cassette.

Each cassette contains currency of a single denomination. The standard denomination settings are £5, £10 and £20. Two other settings are reserved to indicate that the cassette contains other media or that it is not used.

The ICL Series 7000 note dispenser counts seven notes per second and can dispense notes of a single denomination or a combination of up to four denominations. It can also dispense other media (for example stamps, traveller's cheques or coupons) together with cash. If the ATM is unable to dispense a note properly, it diverts the note into a reject section in the top cash cassette, thus eliminating the need for a separate reject note bin.

Sensors in the note dispenser monitor cash supplies and generate status messages to the host computer when supplies are low. The note dispenser also monitors and reports conditions such as note jams to the host computer.

Envelope depository

The optional envelope depository contains an envelope transport mechanism, shutter, stamp wheel printer and envelope deposit bin. For a deposit transaction the customer inserts an envelope containing cheques or notes. The depository accepts the envelope, stamps it with up to 50 characters of identifying data and deposits it in the envelope bin. An optional, lockable, tamper-resistant bin is available.

Printers

ICL supplies a printer for producing receipts and statements with all ICL Series 7000 models. A journal printer is optional.

Receipt and statement printer

The receipt and statement printer prints transaction acknowledgements and interim statements of account activity. You can also print information about types of accounts and other financial services offered to your customers. Under host computer control, the printer produces a receipt or statement, cuts it from the roll and sends it through the dispensing slot.

Printer paper feeds from a coreless roll, with fully automatic backup from a second roll. Automatic paper backup reduces the need for service calls to replenish paper; it also minimises paper waste.

The receipt and statement printer can print in either of these modes:

- **Horizontal (sideways)**
  Prints up to 40 lines of transaction data. A line on a 2 3/4 inch receipt can contain up to 26 characters; a line on a 3 1/2 inch receipt can contain up to 34 characters
- **Vertical**
  Prints up to 60 lines with up to 80 characters per line

Receipts can be printed either sideways or vertically. Statement printing is always in vertical mode. If you plan to print both receipts and statements, you need to consider whether receipts are to be printed horizontally or vertically when designing preprinted forms. Preprinted forms have a fixed length and top of form marks to guide the form cutter. The printing must not be in the area of the top of form marks and it must not obscure data printed on the ATM printer.

Figures 3 and 4 show a receipt printed sideways and a statement printed vertically on the same ATM, respectively. Figures 5 and 6 are examples of a receipt and a statement both printed vertically. *The Customised Bank* is the only preprinting on the form. There are various ways to design receipt and statement forms and ICL can help you design forms tailored to your needs.

Journal printer

The optional journal printer prints up to 40 characters per line on roll paper. It logs transactions, status codes and operating activity to provide a continuous audit trail. The log remains in the ATM until an operator removes it.

Disk drives

An ICL Series 7000 ATM has both a diskette drive and a hard disk drive.

Diskette drive

You can use the 3½ inch, high density diskette drive to install the system and load new versions of application software or colour graphics images.

Hard disk

The 20Mb hard disk drive is used primarily for loading programs, data and colour graphics images into memory. An ICL Series 7000 ATM with the Electronic Journal option records electronic journal data on the hard disk (see page 22).

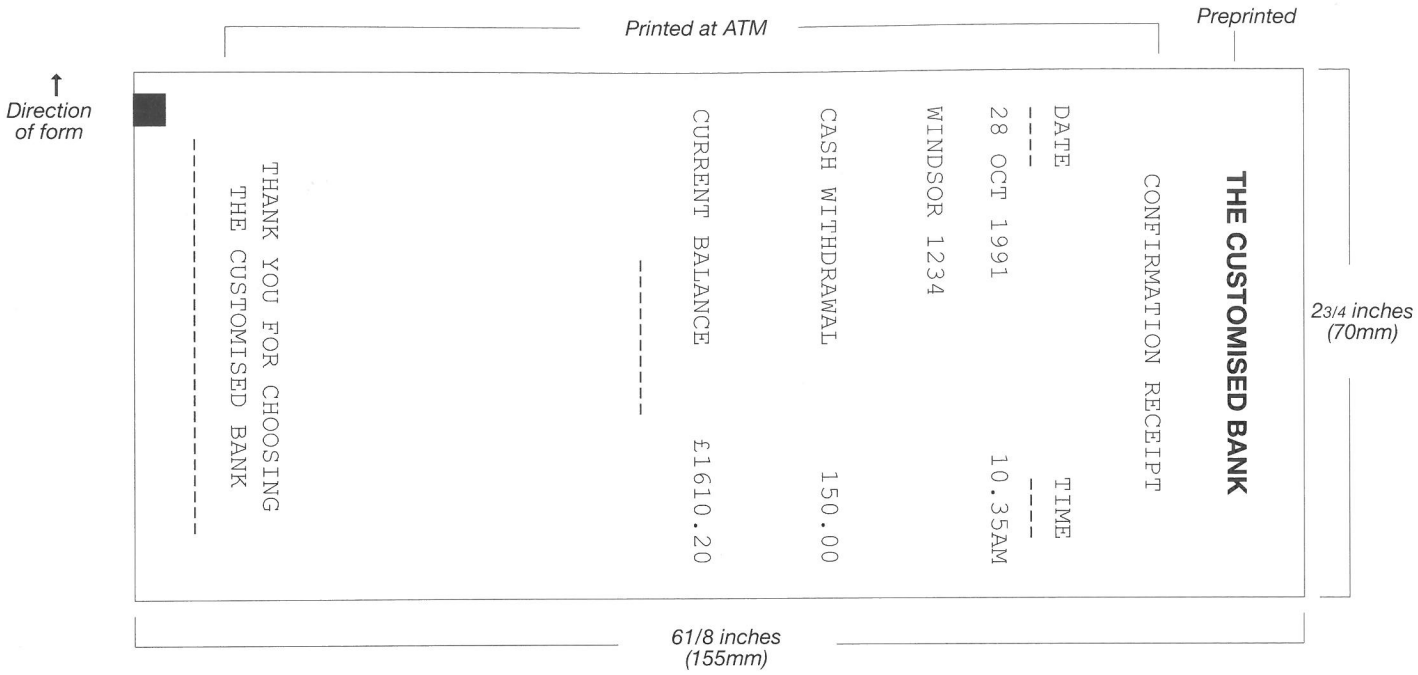


Figure 3 Receipt printed sideways

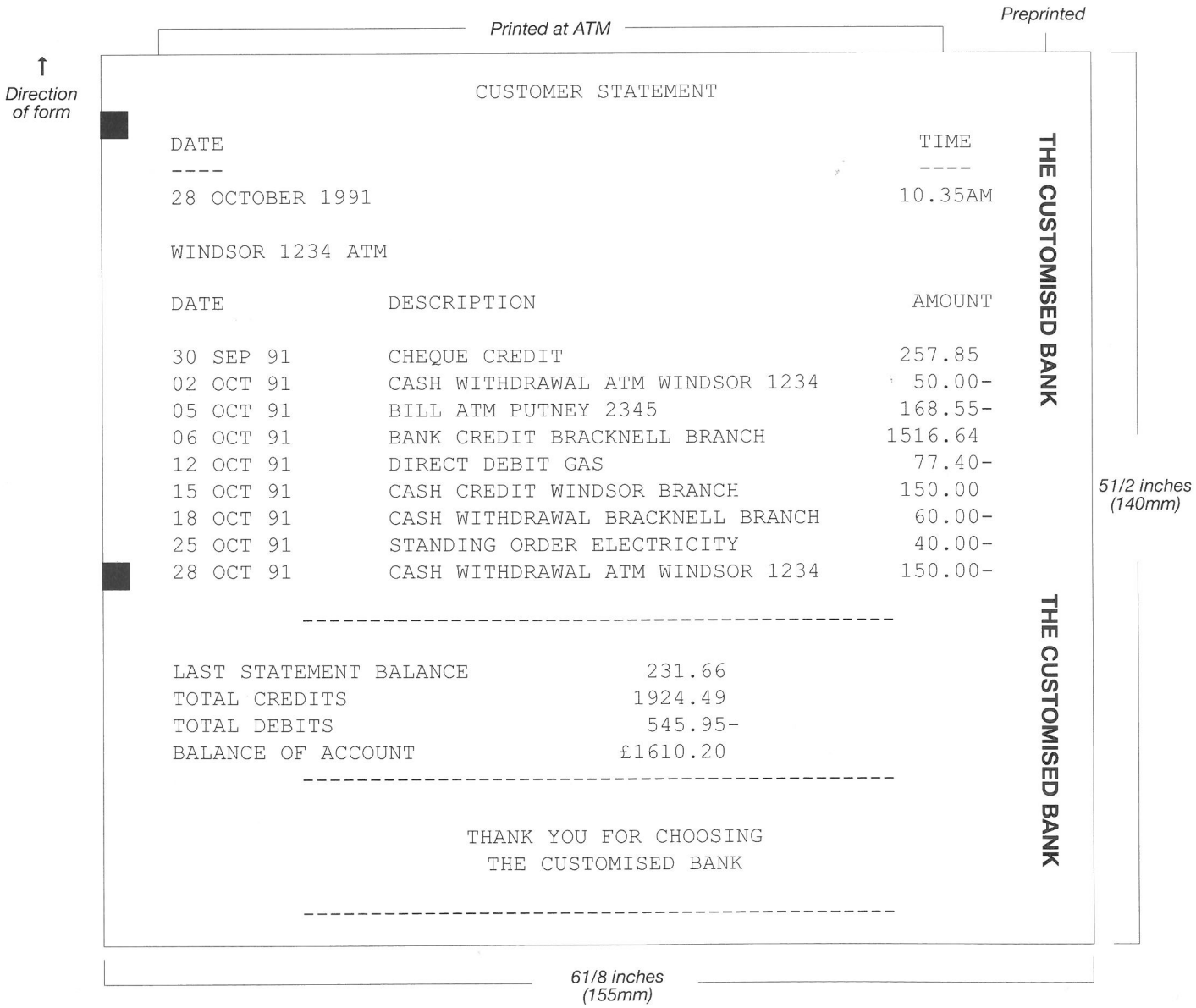


Figure 4 Statement printed vertically

Figure 5 Receipt printed vertically

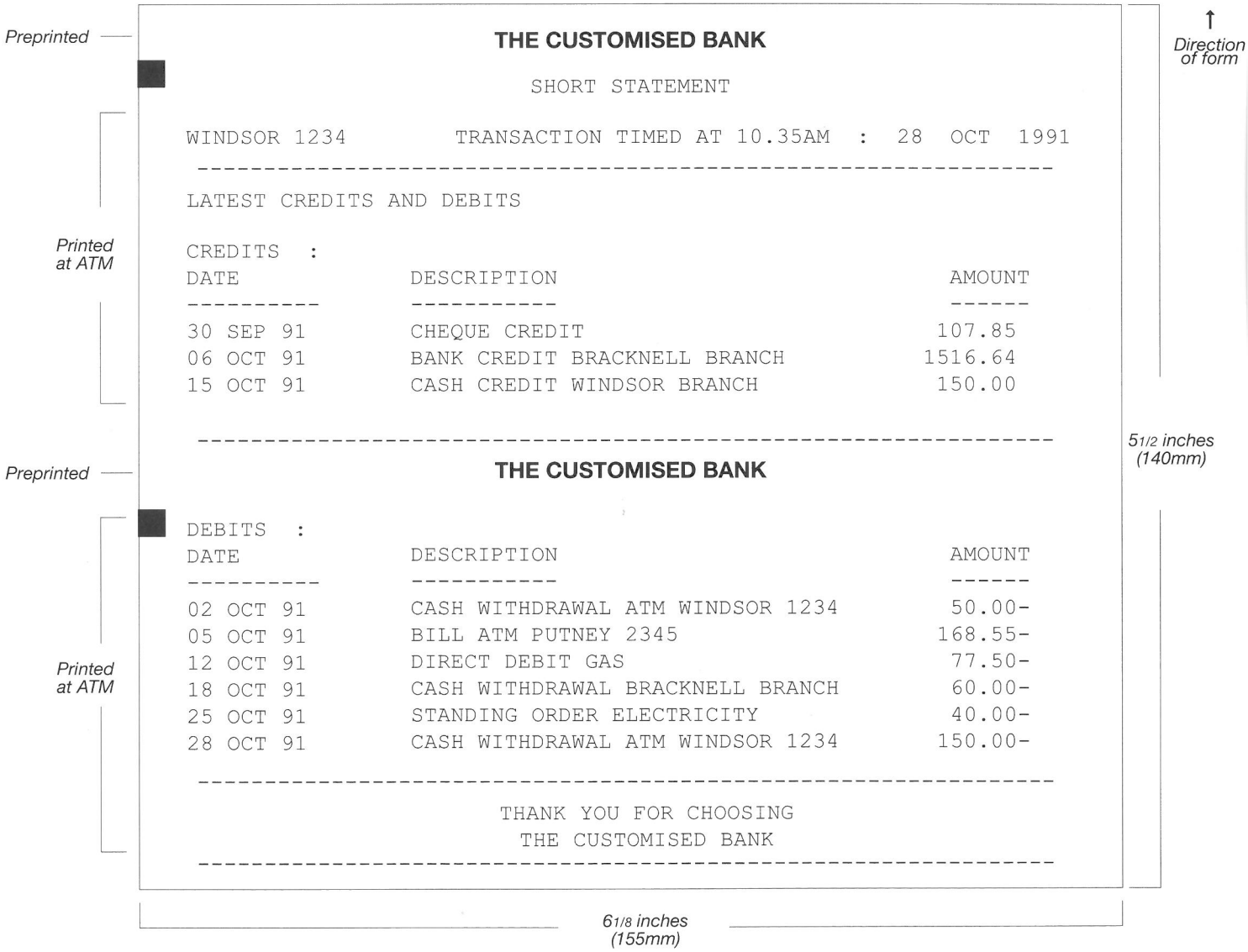


Figure 6 Statement printed vertically

Service/maintenance panel

The service/maintenance panel consists of a hexadecimal keypad and a mode key switch for controlling three mode settings:

AUX (maintenance)

OPER (operating)

IPL (Initial Program Load)

Rear-serviced models have a 9 inch CGA compatible display screen for operator displays.

The hexadecimal keypad has 16 numeric keys and eight function keys; these functions keys only operate in AUX mode. Using the keypad and control panel, your staff can perform software maintenance functions and service engineers can perform maintenance and test functions.

Figure 7 illustrates the service/maintenance panel for a rear-serviced ICL Series 7000 ATM. A front-serviced model has the same keypad and mode key switch, but the operator displays appear on the customer screen.

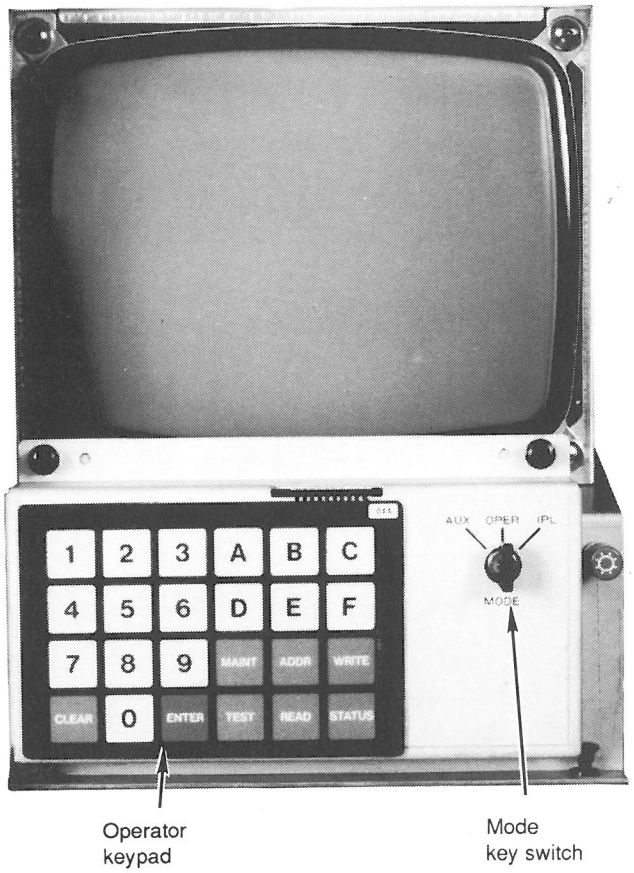


Figure 7 Service/maintenance panel

Control unit

The control unit uses programs stored in the ATM processor memory to control hardware and interface circuitry operations and communicates with the host computer via a modem. The control unit and the hard disk drive load application software into ATM memory.

Voice guidance

The voice guidance option offers recorded messages to help customers use the ATM. ICL provides a standard set of 16 recorded messages. You may substitute up to 32 messages, customised to your business.

Security devices

The following subsections describe the protective and reporting devices that preserve security at the ATM.

Locks

For all ICL Series 7000 models, a key lock secures the upper part of the ATM cabinet. The lobby models also have a key lock on the door that covers the front of the cabinet. Inside the cabinet, additional locks control access to components:

- Optional lockable card capture boxes and envelope depository bins
- Two different key locks for each cash cassette give you the option of setting the locks so that two people must be present when opening a cassette
- You need a key to operate the mode key switch on the service/maintenance panel

Safe

The lower section of the ATM is a safe that houses the note dispenser and envelope depository. The safe is constructed of high quality steel and is UL 291 approved with a TL 15 rating. It opens either at the front or rear, depending on the ATM service access. Figure 8 shows the safe in a front-serviced ICL Series 7000 ATM.

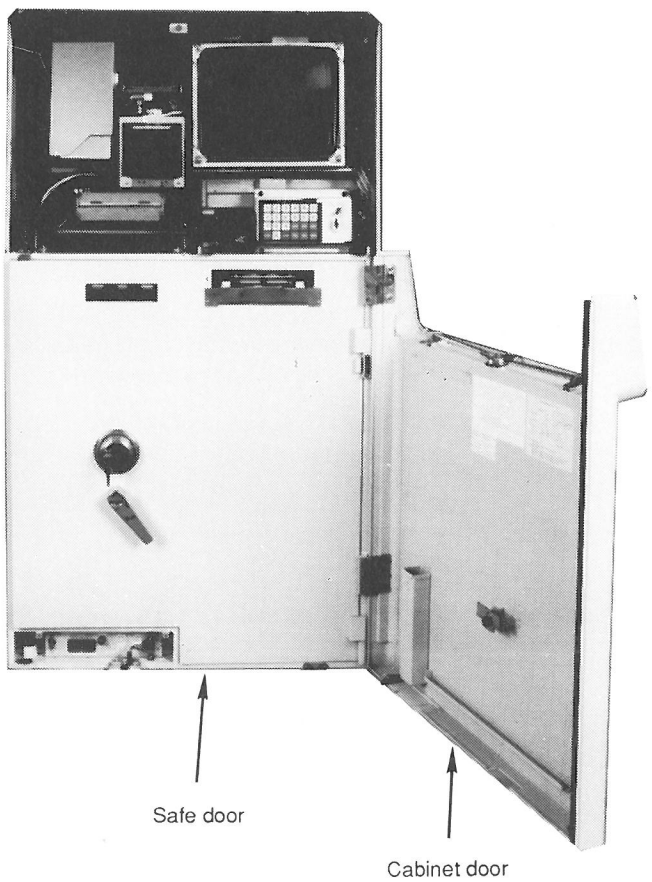


Figure 8 ICL Series 7000 ATM with safe

These are the standard security devices for the safe:

- **Dial lock on the safe door**
  A key must be inserted before the lock accepts the combination
- **Duress alarm connected to the dial lock**
  ICL recommends connecting the duress alarm to a silent alarm to reduce the risk to a person forced to open the safe
- **Tamper switches**
  These switches are wired for connection to external security alarm systems or to the ATM host reporting system

These security devices are optional for the safe:

- **Safe and cabinet door alarm switches**
  These switches are wired for connection to external security alarm systems or to the ATM host reporting system
- **Alarm grid**
  The grid has four interconnected, flexible panels covering the three inside walls and the inside of the door. The alarms a rewired to a terminal strip on the safe floor
- **Fascia alarm for alarm grid**

When activated, the alarm grid, safe door and duress alarms trigger software to transmit event codes to the host computer; all are relay controlled.

Surveillance camera

The ICL Series 7000 ATMs include circuitry for attaching a surveillance camera or video equipment available from a camera vendor. You can choose from two types of interface. The basic camera interface simply triggers the camera to take a photograph. With the intelligent camera interface the camera takes a photograph and marks it with the date, time and transaction number to link it to a specific transaction.

The ICL Series 7000 software consists of the following components:

- ATM system and application software. ICL Series 7000 software is written in Microsoft C and uses the MS OS/2 operating system. The system and application software is installed from 3½ inch diskettes and stored on the ATM hard disk from which it is loaded into memory
- Configuration data
- Off-line operation software
- These optional workstation software packages run on a PC using the OS/2 operating system:
  - ATM Configuration Product (ACP)
  - ATM Electronic Journal Product (AEJP)

Figure 9 illustrates how these software components relate to one another.

ATM system software

The ATM system software consists of the following layers:

- Device drivers to handle interrupt driven I/O and provide low level functions such as CMOS memory mapping and system rebooting
- Device handlers to provide communication between applications and devices
- Application Program Interfaces (APIs), which comprise a library of subroutines called by applications. They include a set of general utility routines, a set of routines to interface with device handlers, and routines to perform direct input and output for certain devices

ATM application software

The ICL Series 7000 application software includes support for Diebold or NCR compatible operation, software maintenance functions, test functions, information capture, security/sensor monitoring and the Electronic Journal option.

Emulation software

The ICL Series 7000 emulation software provides functional compatibility that allows an ICL Series 7000 ATM to operate in the same network as Diebold 911, 912 or NCR ATMs. ICL application software offers enhanced compatibility as follows:

- Configuration data is downloaded from a host computer or loaded from diskettes produced by the ATM Configuration Product (ACP)
- Maintenance and settlement status messages are sent to the host computer when the ATM changes from operating mode to maintenance mode and vice versa
- Personal Identification Number (PIN) verification methods, including the optional Data Encryption Standard (DES) and the Diebold encryption algorithm
- Rear settlement procedures
- Use of the Electronic Journal option
- Remote status enquiry and remote diagnostic capabilities
- Host-to-ATM and ATM-to-host message formats

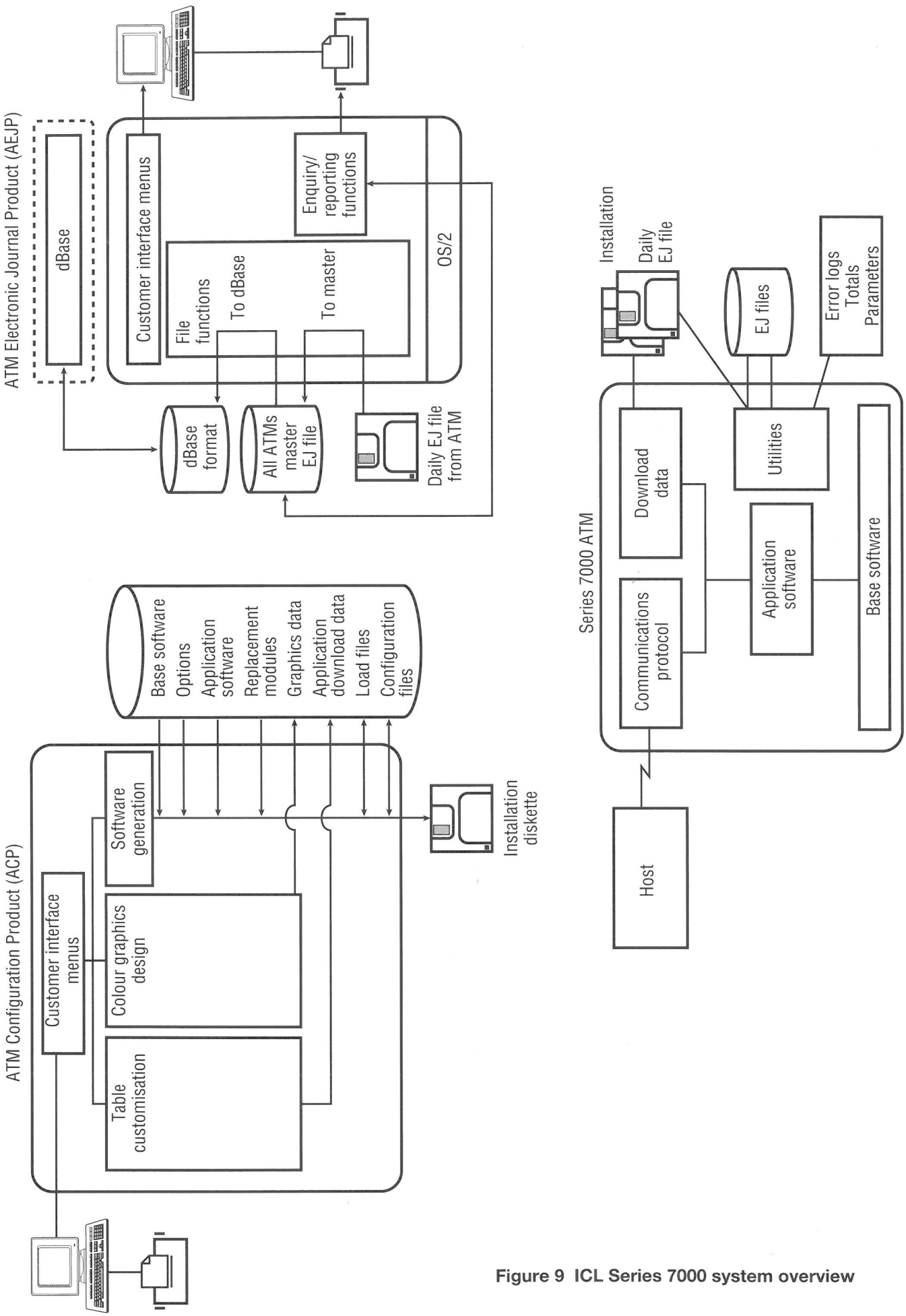


Figure 9 ICL Series 7000 system overview

Software maintenance functions

This section describes the menu driven software maintenance functions, which an operator can perform in maintenance mode. You can control access to these functions with password protection. ICL Series 7000 maintenance functions are described below.

IPL initialisation parameters

This function has a set of subfunctions for entering the system data required after the initial program load.

The options for the IPL initialisation parameters are shown in the following table.

Option	Function
DES keys	For systems with DES PIN verification/encryption, to enter or change the DES key data
Note denominations	To verify settings of currency denomination selectors on cash cassettes. (Software detects cassette setting through electronic interfaces on cassette)
Machine number	To enter a six digit Machine ID number for use in error reports, the Electronic Journal option and host messages
Date/time	To verify or change calendar information
Communication address	To verify or change terminal communication address

Supply and processing counts

This function displays the contents of the supply and the processing counters. The operator can print the supply and processing counts and clear the counters. The function monitors these items:

- Number of dispensing transactions
- Number of rejected transactions
- Number of notes dispensed from each cash cassette
- Number of notes rejected from each cash cassette
- Number of receipts printed
- Number of statements printed
- Number of captured cards
- Number of deposits accepted
- Number of function commands received from the host
- Number of cards inserted into the card reader
- Number of cards accepted by the ATM

Error and event counts

The ICL Series 7000 keeps two types of error and event tallies:

- **Unit error tallies**
  A count of all the status conditions and errors for each ATM component
- **Unit error number tallies**
  A count of the errors for an individual component, by type of error

It tracks the following components and events:

- System
- Receipt/statement printer
- Journal printer
- Note dispenser
- Card reader/writer
- DES processor
- Communication line
- Envelope depository
- Diskette drive
- Hard disk drive
- Voice guidance
- Camera
- Electronic Journal option
- Security event
- Service event
- Miscellaneous events
- Software

The operator can print error and event totals and clear the counters.

Read and print card data

When the operator inserts a card into the card reader, this function prints the contents of the card magnetic stripe on a receipt.

Exercise subsystems

This function tests the note dispenser, note dispenser shutter (if present), journal printer, receipt and statement printer, voice guidance unit, envelope depository shutter (if present) and envelope depository. Errors are logged in the journal.

Supervisor functions

These functions activate or deactivate password protection, add, change and delete passwords, and authorise access to some or all maintenance and test functions.

Password change

This function only changes passwords. It displays access authorisation, but the operator cannot change the authorisation.

Utility functions

These functions include the following subfunctions, which are comparable to standard operating system utilities:

- **Format diskette**
  Formats diskettes
- **Copy file to diskette**
  Copies ATM files from the hard disk to a diskette
- **Communication line trace**
  Displays and logs application communication data

Error exception table

For each code in the error exception table, this function sets action codes that specify what the ATM does when that event occurs. The action types are:

- Print on journal printer
- Add to totals
- Save in error log
- Report to electronic journal
- Produce short journal printer report
- Reboot system

Open/close note dispenser door

This function toggles the note dispenser shutter on a rear-serviced ICL Series 7000 through the wall model.

Electronic journal functions

This function provides the following subfunctions for managing the electronic journal files:

- Close the current file and open a new one
- Copy a file to a diskette without deleting it from the hard disk
- Delete a file
- Display a file header
- Enquiry into a file, searching for records by the type and/or the date/time parameter
- Copy a file to a diskette and delete it from the hard disk

Test functions

The menu driven test mode functions provide a variety of procedures for testing ICL Series 7000 devices at the service/maintenance panel. You can control access to these functions with password protection. ICL Series 7000 test functions are listed below.

Subsystems test

This function individually tests the note dispenser, journal printer, receipt/statement printer, voice guidance unit, envelope depository, camera interface, card reader/writer and communications. It can also perform a total test of all subsystems in sequence.

Keypad

This function tests either the service/maintenance keypad or the customer keypad (including the function keys).

Screen

This function tests either the service/maintenance screen or the customer screen.

TRM (terminal I/O) ports

This function displays the current TRM I/O port settings (ON or OFF); an engineer can toggle the settings.

DES board

This function creates test data that DES encrypts and uses as a test key. The test then encrypts the test data, decrypts it and compares it with the original data.

Communication ports

This function performs an internal or external loopback test on either the modems or the main RS232C ports. It also performs an external loopback test on RS485 communications.

Transaction counter

This function increments the transaction counter.

Speaker

This function exercises the voice guidance speaker by sending different tones at varying intervals.

Diskette (drive)

This function opens a diskette test file, writes to the file and reads from it. After comparing the data read with the data written on the file, the test closes the file and deletes it.

Hard disk (drive)

This function tests the hard disk in the same way as the diskette drive test.

Open/close indicator

This function toggles the ICL Series 7000 OPEN/CLOSED indicator.

Error/event reports

This function displays/prints detailed error and event log information.

Hardware configuration

This function enables you to select hardware options (depository, journal printer, note dispenser door, card reader type, DES, voice guidance, auto backup and camera).

Information capture

The ICL Series 7000 information capture software detects and reports the following types of errors and events: hardware, software, security, service and miscellaneous. Depending on the type of error and the application software, the ATM takes one or more of the following actions:

- It prints the error/event on the journal printer, if the printer is available
- It adds the error/event to the totals in CMOS memory
- It logs the hardware error, software error and event in the appropriate log file
- It reports all errors to the electronic journal, if your system uses the Electronic Journal option

Security/sensor monitoring

The ICL Series 7000 security/sensor monitoring software tracks the security and device status for the items listed below and it reports changes to the information capture utility above:

- Outer cabinet door open or closed
- Safe door open or closed
- Duress alarm triggered
- Cassette 1, 2, 3, or 4 removed or inserted
- Deposit bin removed or inserted
- Mode key switch turned to IPL/OPER/AUX
- Hexadecimal switch settings changed

Alarm conditions (outer cabinet door is opened or closed and the safe door is opened or closed) are also reported to the host.

The Electronic Journal option

The Electronic Journal (EJ) option logs ICL Series 7000 data in electronic journal files on the ATM hard disk. This file has its own directories and can contain many day files. Directory information includes day file name, starting and ending sector, and day file status.

The Electronic Journal option logs data from such events as transactions, error messages, status messages and communication between the host computer and the ATM. It formats the data into one of the following record types:

- Hardware event
- Software event
- Security event
- Service event
- Transaction request
- Transaction completion
- Host communication/miscellaneous
- Application error

The system adds records to the EJ ATM file while disk space is available. The operator can close day files using a software maintenance function and create new ones up to 15 times each day.

Configuration data

Configuration data specifies the operations performed and messages displayed during transaction processing. The following types of configuration data apply to Diebold or NCR compatible software:

- **Terminal parameters**
  Define control options, specify time intervals for timers and error counts, and assign logical unit number
- **Transaction processing state tables**
  Define operational sequences that handle customer and administrative transactions and specify accompanying screen displays
- **Screen library**
  Contains messages that appear on the customer screen to guide customers through transaction sequences; it also holds control data for activating voice guidance and playing recorded messages
- **Financial institution tables**
  Contain data for controlling PIN encryption and verification
- **Encryption key data**
  Encrypts and decrypts customer account data
- **Configuration identification data**
  Specifies terminal configuration level

An ICL Series 7000 ATM can receive configuration data in either of the following ways:

- Downloaded from the host computer into RAM during initialisation
- Loaded from diskette files generated when using the ATM Configuration Product (ACP) as described on page 21

Off-line operation software

When connected to a controller, the ICL Series 7000 can operate in either temporary or permanent off-line mode.

- In temporary off-line mode, for normal operation, the ICL Series 7000 is connected to a controller, such as the Diebold 1010, using Diebold 1010 message format. If the communications line to the controller becomes unavailable, the ICL Series 7000 continues to function in off-line mode until the line becomes available again. The stored transaction data is then transmitted to the controller
- In permanent off-line mode the ICL Series 7000 authorises transactions locally and stores transaction data on the hard disk. This transaction data may then be removed for subsequent processing

ATM Configuration Product

The ATM Configuration Product (ACP), illustrated in Figure 10, is a menu driven software package that has three major functions:

- **Table customisation**
  You can modify configuration data
- **Colour graphics design**
  You can design colour graphics screens with special colours, fonts, scrolling and animation
- **Software generation**
  You can selectively generate software options, protocol, replacement modules, load files and graphics or font files into one loadable application. Configuration and version level control, as well as tracking, are automatic

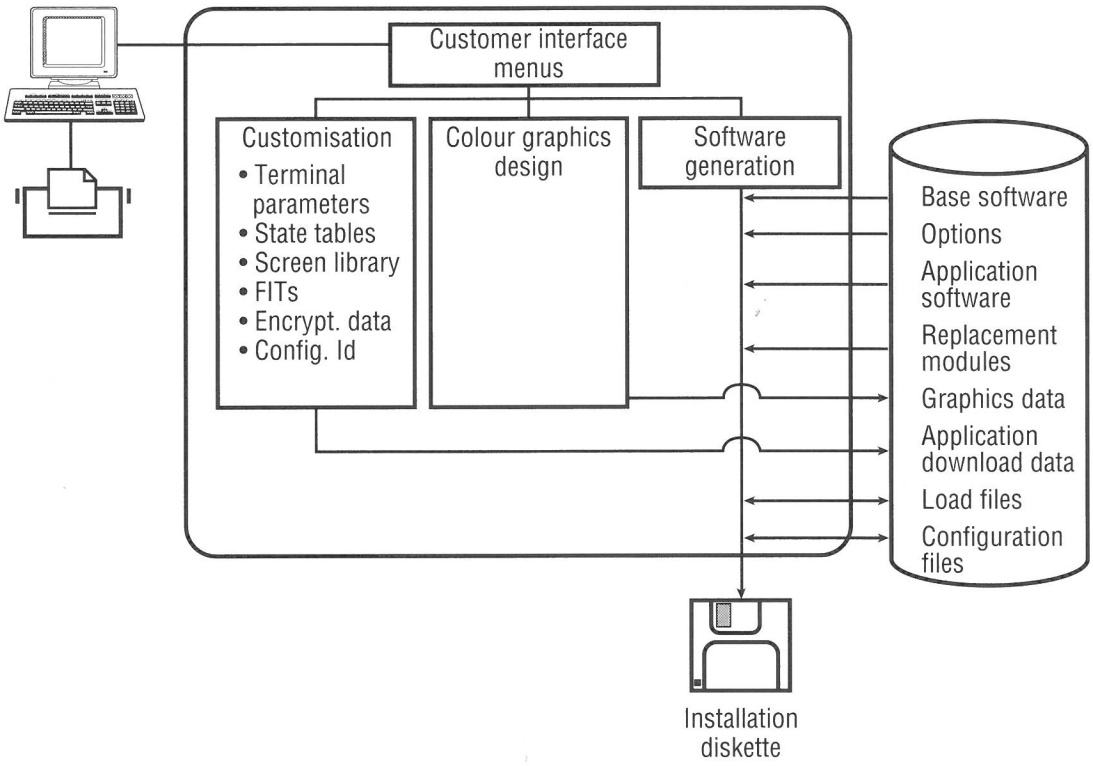


Figure 10 ATM Configuration Product overview

ATM Electronic Journal Product

The ATM Electronic Journal Product (AEJP) is a menu driven software package that maintains a master file of data gathered by the Electronic Journal option in the ATMs. Figure 11 illustrates AEJP. The AEJP can accumulate data from multiple ATMs and provides the following functions:

- **File manipulation**
  You can transfer electronic journal files from a diskette created at the ATM to the AEJP master file. If you choose, you can convert the master file to dBASE* format
- **Reports and enquiries**
  You can use the electronic journal maintenance functions to search for specific data. You also can generate these reports:
  - ATM Electronic Journal file report
  - Error report
  - Security event report
  - Service event report
  - Transaction report
  - Miscellaneous event report
  - Summary reports for transactions and errors

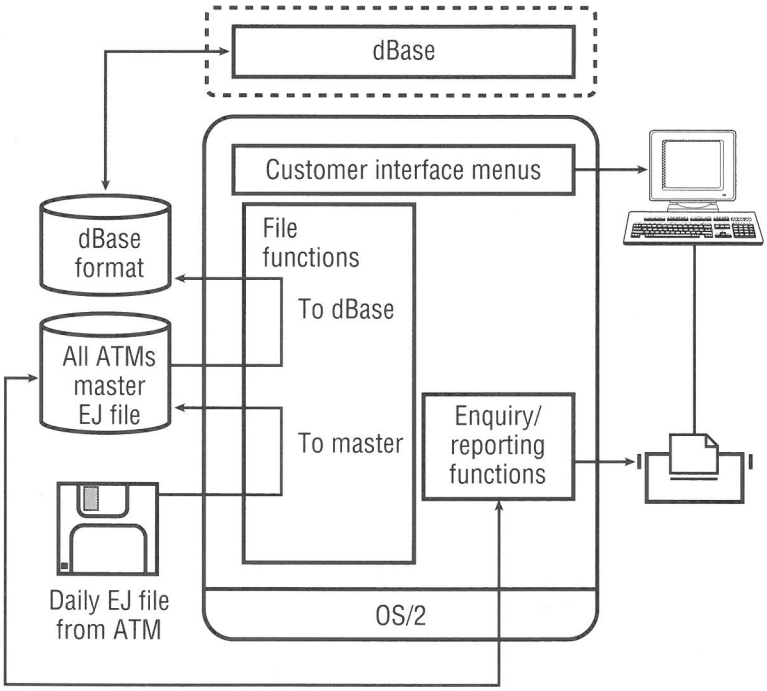


Figure 11 Electronic Journal Product (AEJP) overview

Communications 4

When an ICL Series 7000 ATM is serving customers in on-line communications mode, it is controlled by a host computer as follows:

- The host computer commands the ATM to enter operating or out of service mode. Before putting the ATM into operating mode, the host computer downloads the terminal configuration data if required
- In response to transaction requests from the ATM, the host computer directs all transaction activities, such as dispensing or denying cash, taking deposits, printing receipts and performing related functions to complete customer transactions

This section summarises the ICL Series 7000 data transmission modes, communication protocols, modems and system configuration alternatives.

Communication between the ICL Series 7000 and host

A control unit in the ATM links it with the host computer via modems and a data communication line. This interface provides direct, on-line access to customer records.

A customer initiates a transaction session at the ATM, selects a transaction type and enters the required data. The ATM sends a transaction request to the host computer, which must provide data and authorise transactions. After receiving a reply, the ATM control unit carries out the instructions from the host computer. Programs in ATM memory control the functions of the ATM subsystems (card reader/writer, note dispenser, envelope depository, printers and displays).

This on-line-only mode of operation means that the ATM must be in direct communication with a host computer in order to be available to customers. If the host computer is not in service, the ATM automatically shuts down and displays

TEMPORARILY OUT OF SERVICE

on the customer screen until communication with the host computer is restored.

Data transmission modes and communication protocols

The ICL Series 7000 ATMs operate in synchronous data transmission mode. To simplify integration into existing communication networks, the ICL Series 7000 supports the following widely used communication protocols:

- IBM 3270 Binary Synchronous Communication
- IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC)

Modem requirements

The ICL Series 7000 provides an EIA RS232C serial binary data input/output interface for an external modem connection. ICL can supply a suitable modem cable as an option, but you must supply an appropriate modem. Modem speeds up to 9600 bps are supported by ICL Series 7000.

System configuration alternatives

An ICL Series 7000 ATM can connect to a host computer in any of the following ways:

- Directly on a leased telephone line, with direct connect modems at the ATM and the host
- In a multidrop network, in which modems connect several ATMs to the same physical transmission line
- Through a network of concentrators, multiplexers, transmission lines, loops and modems, connected to multiple host computers

Publications 5

This section describes the major groups of publications for the ICL Series 7000: site preparation and installation guides, ATM hardware operation, programming references and remote workstation operation.

Site preparation and installation

The ICL Series 7000 ATM Site Preparation and Installation manuals, for models 7010 and 7020, and for model 7040, provide information on:

- Physical, environmental and power specifications
- Tasks to be performed by your organisation (for example, installing AC power, ordering modems, cable, and wiring and leasing telephone communication lines)
- Tasks to be performed by ICL service engineers
- Schedules that provide checklists to help meet the target installation date

Hardware operation

For maintenance instructions, refer to the publication *ICL Series 7000 ATM Operation.* The information in this publication forms a basis for developing a detailed transaction and operator's guide for your employees. Topics include:

- Physical descriptions of ICL Series 7000 components
- Examples of using an ICL Series 7000 ATM for financial transactions
- Procedures for replenishing currency, deposit envelopes and paper, as well as for changing printer ribbons
- Procedures for performing software maintenance
- Procedures for cleaning and routine equipment maintenance that can help prevent unnecessary service calls, including requirements for maintaining the ATM operating environment
- Specifications for ordering printer paper and ribbons, deposit envelopes, magnetic stripe cards and cleaning cards for the card insertion slot

Software reference

For more technical details, refer to the appropriate *ICL Series 7000 ATM Software Reference Manual* (for Diebold compatible, NCR compatible or stand alone operation software). Topics include:

- Functions the ICL Series 7000 ATMs can perform and how to select and modify those functions either by making direct entries at the ATM or by using application programs
- Details on data communication requirements, data formats and performance specifications

Workstation publications

The following publications describe how to use the ICL Series 7000 software packages that run on a PC:

- *ICL Series 7000 ATM Configuration Product Operation*
- *ICL Series 7000 ATM Electronic Journal Product Operation*

Components

Appendix A

Table 1 summarises the ICL Series 7000 standard components and options.

Table 1 ICL Series 7000 components

Feature	Standard	Optional
Control electronics	X	
Memory:		
2.5Mb RAM	X	
32K CMOS	X	
3 1/2 inch, high density diskette drive	X	
20Mb hard disk drive	X	
Screens:		
Customer: 13 inch colour (EGA compatible)	X	
Maintenance: 9 inch grey (CGA compatible)	X	
Voice guidance		X
Message displays:		
English	X	
Non-English		X
Keypads:		
Customer, with braille and eight function keys	X	
Maintenance, hexadecimal	X	
Printers:		
Receipt/statement (dot matrix)	X	
Journal (dot matrix)		X
Security devices:		
Alarm wiring	X	
External alarm capability	X	
Alarm sensors on safe grid and safe door		X
Cabinet door sensors	X	
Heavy duty safe	X	
Surveillance camera interface	X	

Table 1 ICL Series 7000 components (continued)

Feature	Standard	Optional
Note dispenser:		
Two cassettes	X	
Three cassettes		X
Four cassettes		X
Depository:		
Envelope depository		X
Envelope dispenser on unit		X
Service/maintenance panel	X	
Card capture capability:		
With card capture tray	X	
With lockable card capture box		X
PIN verification:		
Remote: with or without encryption	X	
Local: using DES or another algorithm		X
Card readers[1]		
Tracks 1 and 2 dip card reader		X
Track 2 motorised card reader		X
Tracks 1, 2 and 3 motorised reader/writer		X
Electronic journal[2]		X
External modem interface[3]	X	
Diagnostics: on a board for each major subassembly	X	

[1]You select one of the three options

[2]Large-capacity, hard disk file

[3]You must supply the external modem

Specifications

Appendix B

Tables 2 to 11 summarise the ICL Series 7000 physical, environmental, electrical and functional specifications.

Table 2 ICL Series 7000 system specifications

Characteristic	Model 7010/7020	Model 7040
Dimensions:		
Height	58.3 inches (1480mm)	64.7 inches (1643mm)
Width	30.4 inches (771mm)	30.4 inches (771mm)
Depth	36.8 inches (936mm)	33.3 inches (846mm)
Weight	1168 lbs. (530 kg)	1236 lbs. (561 kg)
Environment:		
Temperature	32° to 95F° (0° to 35C°)	Indoors: 40° to 104F° (5° to 40C°)
		Outdoors: -30° to 130F° (-35° to 55C°)
Relative humidity	10 to 85%	Indoors: 10 to 85%
		Outdoors: 0 to 100%
Power consumption:		
Normal operation	0.8 kVA	0.8 kVA
Startup	1.5 kVA	1.5 kVA
Heat generation	2500 Btu/hr	2500 Btu/hr

Table 3 Card reader/writer specifications

Characteristic	Specification
Read-data density:	
Track 1	210 bpi (optional)
Track 2	75 bpi
Track 3	210 bpi
Write-data density:	
Track 3	210 bpi (optional)
Power supply:	
Card reader	24V DC
Card reader/writer	24V DC
Dip reader	5V DC, ±12V
Card-feed speed	7.4 inches/sec (19 cm/sec)
Card life	1000 passes
Error rate	1/500 passes

Table 4 Receipt and statement printer specifications

Characteristic	Specification
Print method	Dot matrix, 9 wire
Print speed	2.1 lines/second
Ribbon	Cassette
Paper:	
Width	6 1/8 inches (156mm)
Weight	16 to 20 lb. bond
Paper-roll yield:	
Receipts	3200 per roll (2 3/4 inches wide by 6 1/8 inches long) (69.8 mm by 155.6 mm)
Statements	1600 per roll (6 1/8 inches wide by 5 1/2 inches long) (155.6 mm by 139.7 mm)
Characters/line:	
Receipt	Up to 34[1] or up to 80[2]
Statement	Up to 80
Character set	Upper/lower case
Character height:	
Vertical printing	.096 inches (2.4 mm)
Horizontal (sideways) printing	.084 inches (2.1 mm)
Variable pitch	Horizontal: 10, 12, 15 CPI
	Vertical: 6,8 LPI
Print pitch	Horizontal: .084 inches (2.1 mm)
	Vertical: .133 inches (3.326 mm)

[1]Horizontal printing

[2]Vertical printing

Table 5 Journal printer specifications

Characteristic	Specification
Print method	Dot matrix, 9 wire
Print speed	2.3 lines/second
Characters/line	Up to 40
Character set	Upper/lower case
Ribbon	Cassette

Table 6 Note dispenser specifications

Characteristic	Specification
Capacity	Up to four cassettes; 3000 new notes or 2500 old ATM-fit notes per cassette.
Denominations	Seven settings available.
Withdrawal amount	Up to 40 notes per transaction
Reject capacity	150 notes
Dispensing method	Separate notes
Note transport speed	7 notes per second
Low notes indication:	
First level	About 100 notes[1]. Operation continues
Second level	About 40 notes[1]. Processing continues from the other cassette. If all of the cassettes are empty, operation stops immediately after the current transaction
Checking methods	Checks for double note feed, skew, miscount and jams
Interface	RS485

[1]Level set at factory; can be reset at installation site

Table 7 Envelope depository specifications

Characteristic	Specification
Capacity	Up to 350, depending on envelope size
Standard envelope size	9.25 inches (235 mm) long by 4.33 inches (110 mm) wide
Acceptable envelope size[1]	Length: 8 7/8 to 10 inches (225 to 254 mm) Width: 3 3/4 to 4 3/4 inches (95 to 121 mm)
Envelope thickness when full	Up to 0.5 inches (up to 12.5 mm)
Print method	Stamp
Print speed	About 1.7 characters/second
Print line	Up to 50 characters (3 mm pitch)
Character configuration	Formed
Character set	20 characters, as follows: 0 to 9 blank # £ * + , - . / :

[1]Use only standard or minimum-sized envelopes for the envelope depository with a lockable deposit bin

Table 8 Envelope dispenser specifications

Characteristic	Specification
Dimensions:	
Height	12 inches (305 mm)
Width	8 inches (203 mm)
Depth	16 inches (406 mm)
Capacity	Up to 400 envelopes
Method of taking envelope	Manual

Table 9 Customer display specifications

Characteristic	Specification
Screen	13 inch colour (EGA compatible); four mechanical function keys to left and four to right of screen; optional privacy lens limits left and right side field of view and reduces glare
Display capacity	Customer mode: 16 lines, 32 characters per line Service/maintenance mode[1]: 25 lines, 80 characters per line
Video attributes	Reverse image; blinking video; animation; horizontal and vertical scrolling; programmable character colour, font and size
Brightness control	Automatic light sensing

[1]Front-serviced ATMs only; rear-serviced ATMs have a 9 inch screen in the rear for service/maintenance purposes

Table 10 Communication specifications

Characteristic	Specification
Protocols	- IBM 3270 Binary Synchronous Communication - IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC)
Transmission mode	Synchronous, asynchronous
Line speeds	1200, 2400, 4800, 9600 bps

Table 11 Power supply specifications

Characteristic	Specification
Input voltage	240V AC ±10%, 50 Hz ± 1%
Output voltage:	
AC	115V
DC	+ 5V/ ±12V/ + 24V
Output voltage adjustment	+ 5V, + 12V, - 12V

Acronyms

Appendix C

The following abbreviations and acronyms are used in this publication.

Acronym	Definition
ACP	ATM Configuration Product
AEJP	ATM Electronic Journal Product
ATM	Automated Teller Machine
BSC	Binary Synchronous Communication
DES	Data Encryption Standard
EBCDIC	Extended Binary Coded Decimal Interchange Code
EGA	Enhanced Graphics Adapter
EJ	Electronic Journal option
FITs	Financial Institution Tables
ICP	Intelligent Communications Processor board
IPL	Initial Program Load
LED	Light Emitting Diode
LU	Logical Unit
PC	Personal Computer
PIN	Personal Identification Number
SDLC	Synchronous Data Link Control
SIA	Serial Interface Adaptor
SNA	Systems Network Architecture
SYN	Synchronous communication
TTW	Through The Wall

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