Appendix V

Overview of Punch Card & Card Reader Systems

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One of the most valuable commodities in business is time. To better manage time while reducing expenses is the issue that most businesses need to pay attention to, in order to maximize efficiency which leads to increased productivity. There are some issues to address when it comes to choosing time and attendance system to work for you such as reduction of payroll-processing time, improved of payroll accuracy and improved of labor management through increased control and information. This article will review on conventional time and attendance systems which include of punch card system and various other types of card systems.

Manual Punch Card System

Manual punch card system is a system where employees punched time clocks, and at the end of the pay-period, supervisors manually totaled the hourly shifts. The organization tracked payroll totals through the manual punch card system. Total working hours and overtime hours were manually added by administration on a master time sheet. Master calculations were called into a payroll processing company. While this arrangement met the organization's basic needs, management was concerned with the amount of time supervisors and administrators spent manually keeping records. The payroll specialist spent more than two days a month pouring over punch cards, verifying totals and manually transcribing them into the summary journal.

Acroprint ATR120 Electronic Cross-Shift Time Recorder

Acroprint BP-125

It was virtually impossible to check employee time cards each day. Consequently, supervisors relied on their memories when completing missing in/out punches at the end of a two-week pay period. This often led to incorrect employee hours. Each supervisor had to round up or round down punch times when calculating pay period totals. It was difficult to ensure that rounding was consistently applied throughout the organisation. Duplicate data-entry was another concern. The same information was might be rewritten at least two times when totals were compiled at the end of a pay period. An incorrect figure entered on a calculator could easily throw off totals.

While the system is cheaper than many other time and attendance systems available in the market, the system cause inconvenience to a business particularly in this information technology era where information is needed almost immediately most of the time.

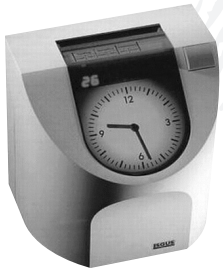
Lathem Time 6000E Series

Manual Punch Card System

Several brands of manual punch card system available in the market within price range from USD189 and USD750 are *Acroprint, Amano, Detex, Lathem, Isgus, Icon* and *Pyramid*.

Amano MRX35
ACI MRX35

Pyramid PTR4000



Isgus 2005

Amano BX-6000

Card Reader System

A card reader system is a type of electronic identification system that is used to identify a card and then perform an action associated with that card. Depending on the system, the card may identify where a person is or where they were at a certain time; or it may authorize another action, such as disengaging a lock. The reader will store the information and/or send it to a central location, where it can be checked later to ensure that the guard has patrolled the area. Other card reader systems can be associated with a lock, so that the card holder must have their card read and accepted by the reader before the lock disengages.

A complete card reader system typically consists of the following components:

- **Access cards that are carried by the user** - A "card" may be a typical card or another type of device, such as a key fob or wand. These cards store electronic information, which can range from a simple code (i.e., the alphanumeric code on a Proximity card) to individualized personal data (i.e., biometric data on a Smartcard). The card reader reads the information stored on the card and sends it to the control unit, which determines the appropriate action to take when a card is presented.
- **Card readers**, which read the card signals and send the information to control units - The main function of the card reader is to read the code from the card and send that information on to the control unit. Some card reader systems require that the card be physically inserted into the card reader, while others, such as the Proximity system, only require that the card be in the general proximity of the reader. The specific methods by which data is transferred from the card to the reader are discussed under each card technology below.
- **Control units**, which control the response of the card reader to the card - A control unit is typically composed of both hardware and software. This unit is the main connection point for the card readers, locks, location monitoring points, and other wired inputs and outputs of the system. The primary function of the control unit is to record the information on the card, and respond, as appropriate. Depending on the needs and complexity of the system (i.e., the number of card holders, the number of card readers, the number of different permission levels, the types of transaction data tracked, etc.), a control unit can range from a localized control panel to a basic stand-alone PC to a more complex network, such as a Windows NT server or a UNIX-based RISC platform. For some simple systems that do not require the storage of large amounts of data, a localized control panel may be sufficient.
- **Control Unit Software** - The control unit is the main data storage and control center for the system. The control unit functions through a combination of hardware and software. The software is used to execute decision logic based on the interaction of the data stored on the card and its permissions stored in the system database, and the hardware then carries out this logic by powering locks, turning on switches, etc. The majority of card reader systems use software packages (usually Windows-based) to control the system. This software is the decision-making "brain" of a card reader system. It is used to develop and populate the card user database, to establish user "permissions," and to execute the decision logic (such as disengaging locks or recording a card location) when the card is read by the card reader. Card reading software is also used to assign different "permissions" to each card holder. Permissions are defined as the authorization levels given to users specifying the different things they can do within the system. It should be noted that the control of a location through a card reader system is limited only by what can be programmed into the system. Once data from a card has been read by the card reader, it can be used for any purpose that was written into the software.