ERCC Notes on Operation of IBM 029 Card Punch

EDINBURGH REGIONAL COMPUTING CENTRE

Notes on the Operation of the IBM 029 Punch

A. Machine Layout

1. On/Off Switch

Located on right hand side under keyboard.

2. Card Hopper

Located on upper right of machine, holds 500 cards approx. Cards are placed in hopper, face forward, 9 edge down. Sliding pressure plate assures uniform feeding.

3. Card Stacker

Located on upper left of machine, holds 500 cards approx. Cards are stacked automatically, face up, 12 edge to the rear. A weight keeps them in position. When stacker is full, a switch interlocks card feed until cards removed.

Note that a scale in the stacker gives an estimate of the number of cards punched.

4. Punch Station

This is the card station to the right of the machine.

5. Read Station

This is the card station to the left of the machine.

6. Program Drum

This is situated in the centre of machine and allows automatic skipping, duplicating and shifting from numeric to alphabetic punching when programmed.

7. Program Control Lever

Located below the program drum, it controls the operation of the program drum.

In the "On" position the lever is to the left lowering the starwheels on to the drum to sense the holes in the card.

In the "Off" position the lever is to the right raising the starwheels from the drum and the punch is under manual control. The punch should always be left with the lever in the "right" position i.e. starwheels raised.

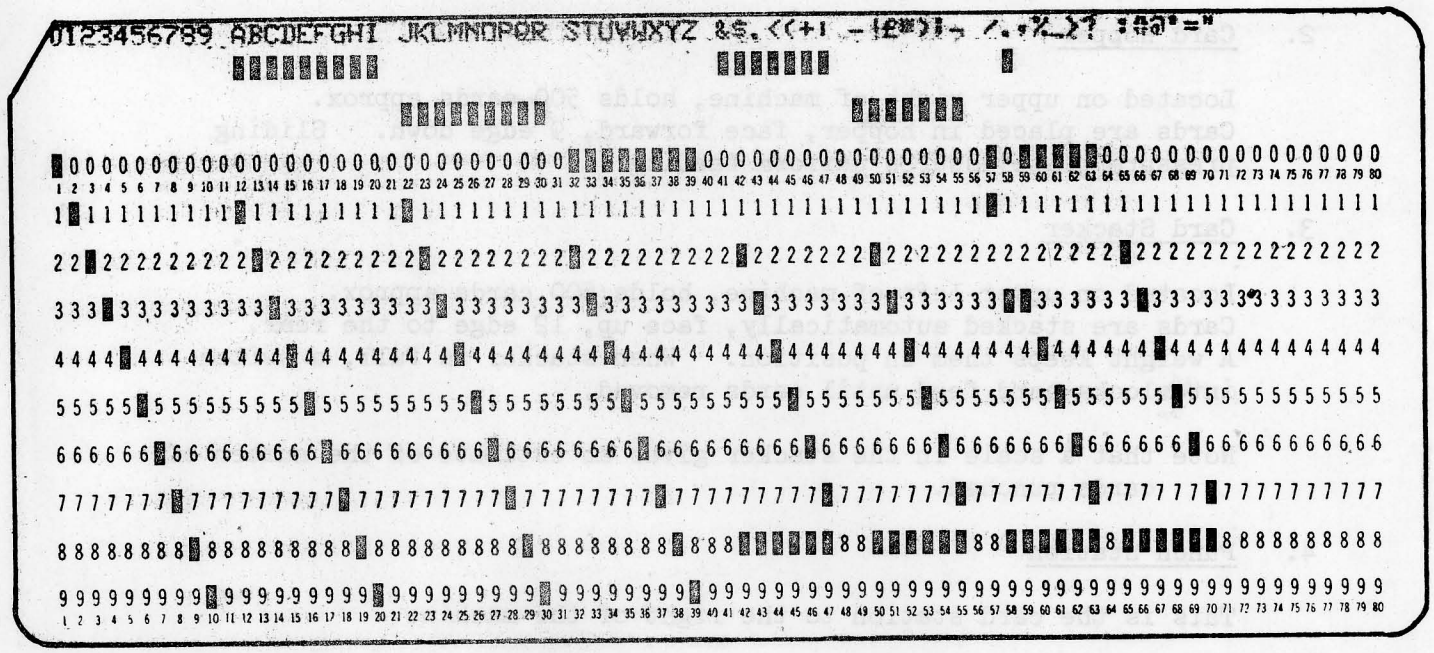
See note later on how to remove drum.

B. Layout of Keyboard

1. The following characters are available.

Numerals 0 - 9
Alphabet A - Z (capital letters only)
Special Characters (see below)

Example of full character set.



Printing along the top of the card is provided automatically.

2. Other Keys and Special Features

(a) Feed

Feeds a card from hopper. When second card fed, first card registered at punch station ready for punching.

(b) Register

Registers both the card at the read station and the card at the punch station ready for duplicating etc.

(c) Release

Releases card from punch station to read station

(d) Multipunch

Holds card in same position as for previous punching to allow a combination of holes to be punched in a column. Multipunched columns should not be duplicated as this can cause damage to printing mechanism.

(e) Backspace

Located below card bed between read and punch positions. Holding down key allows backspacing of card continuously. Cards should not be backspaced more than 20 columns.

(f) Column Indicator

Located at base of program drum. Indicates next column to be punched. Use when spacing or backspacing.

(g) Pressure Roll Release Lever

Located next to column indicator, under cover of program unit. Press this lever to permit manual removal of damaged cards from punch and read stations.

Note Users should not use this feature but should inform the supervisor that a cardwreck has occurred.

(h) Error Reset Key

Resets a locked keyboard.

(i) Alpha and Numeric Shift Keys

Use of these keys gives you upper and lower case characters as long as the shift key is held down.

Note that machine is normally in alpha shift when under manual control and in numeric shift when under program control.

(j) Space Bar

In same position as in a typewriter.

(k) Duplicate

Allows copying of information from card at read station to card at punch station.

To duplicate or correct a card, insert the card into the card bed to the right of the read position. Feed blank card from hopper using Feed key and then use Register key to register both cards at the card stations. Use Duplicate key to copy, inserting new information from keyboard if necessary or use space key to omit information.

(l) Skip

Causes machine to skip to end of field as defined by definition punches (see Programming). Useful when right hand side of a field has not to be punched as often happens in an alpha field. Without program control it gives a space.

C. Functional Control Switches

1. Auto Skip/Duplicate

When this switch is on, skipping and duplicating is automatic from program drum. With this switch off, the operator can override the auto skip and duplication. Should be switched off during the punching of the master card at the beginning of a run.

2. Program Selection

Set to program one or program two whichever you wish to use. If one wishes to change from one program to the other, during the punching of a card, one presses the appropriate key on the keyboard (Prog 1, Prog 2) this is effective to the end of the card or until the other key is depressed.

If Prog 2 key depressed and program 2 not coded on drum card, programming suspended. This is suggested instead of raising starwheels when one wants to temporarily suspend the program during a run.

3. Auto Feed

When this switch on, a card is automatically fed from the hopper when the previous card released from the punch station.

4. Clear Key

Release cards from read and punch stations to stacker.

5. Print

With this key on, the character punched from the keyboard is printed along the top of the card.

6. Left Zero Print

With this key on, zeros to the left of the first significant digit in a defined field are printed.

7. Punch/Interpret (Model C only)

With the switch in "Punch" position the machine is normal for punching cards. With switch in "Interpret" position, prepunched cards (e.g. from reproducer) can be interpreted i.e. characters are printed along top of card.

Note Only use with permission of supervisor.

D. Program Drum

1. Removal

Turn program control lever to the right to raise starwheels, pull drum gently off shaft.

Note that one must never attempt to remove drum while starwheels are down as this can cause serious trouble.

2. To place Program Card on Drum

(a) Hold the drum horizontal with handle on right. Turn handle anti-clockwise.

(b) With 9 edge against rim of drum, insert 80 col. edge of card under smooth edge of clamping strip. Two alignment check holes allow one to ensure that card is flush with metal edge of strip.

(c) Turn handle to centre position to tighten smooth edge and loosen toothed edge of clamping strip.

(d) Wrap card tightly round drum and insert 1 col edge under toothed edge of clamping strip.

(e) Turn handle clockwise to fasten clamping strip.

(f) Put drum on to unit, positioning it so that alignment pin falls into aligning hole in column indicator dial. Turn control lever to left to lower starwheels to engage drum. Press release key to engage reading mechanism fully.

E. Programming Drum Card

Program 1	Program 2	Function
12	4	Field Definition
11	5	Start Auto Skipping
0	6	Start Auto Duplicating
1	7	Alphabetic Shift

Note Machine normally in numeric shift when under program control.

1. Field Definition

A 12 punch (4 in program 2) must be punched in every column except the first (left-hand) position of every field to be skipped, duplicated or manually punched. This defines the number of columns to be skipped, duplicated, or manually punched.

2. Automatic Skip

An 11 punch (5 in program 2) must be punched in the first column of the field to be skipped followed by field definition punches in the rest of the field. If Auto/Dup key is in off position, the auto skip holes on the program card are ignored.

3. Auto Duplication

An 0 punch (6 in program 2) must be punched in the first column of the field to be duplicated followed by field definition punches for the rest of the field. If Auto/Dup key is in off position, the auto duplication holes on the program card are ignored.

4. Alphabetic Shift

This is required as machine is normally in numeric shift when under program control.

A 1 punch (7 in program 2) should be punched in every column requiring alpha punching. Field definition should be punched as well in every column, bar the first, but in this case does not extend the field as for Auto Skip and Auto Dup but allows skip key to be used when whole alpha field not being used. To punch a numeral in an alpha field use the numeric shift key.

5. Manual Field Numeric

Leave a blank in the first column of the field to be punched, followed by field definition punches in the rest of the field.

Note on Interpreting Cards

If all 80 columns are not to be interpreted, punch up a program card and use Auto Skip feature in usual way.