J. I. Kraemer,[1] *M.S.*

The Polaroid Identification System and Its Misuse

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ABSTRACT: The Polaroid Corporation markets special cameras and ancillary equipment for producing business or government identification cards, drivers licenses, and the like. The paper discusses the system's design, components, final product, identifying features of different models, and the potential for misuse.

KEYWORDS: questioned documents, identification systems, security

The Polaroid Corporation, since late 1965, has produced a complete system for the issuance of identification cards. This system has undergone revisions over the years to refine the product and appeal to the largest possible market. As of January 1980 the Polaroid system is used by 21 states for the production of drivers' licenses; by countless other governmental units on all levels; and by any other organization or institution that seeks inexpensive, easily produced identification. The company supplies any necessary security information and the services of its experts to aid in designing a system custom-tailored to the user's needs.

It is the purpose of Polaroid's system to produce an identification card at the lowest cost that incorporates security devices to protect it from fraudulent use and to retain the greatest simplicity of user operation.

This paper is divided into two parts. The first discusses Polaroid's identification systems: its process for producing cards and methods of identification. The second section briefly discusses the misuse of the Polaroid system within the Washington metropolitan area in the past three years.

The Process in General

Polaroid currently markets its "ID-3" identification system, which has been available since 1971. Prior to this, the company manufactured the "ID-2." The first ID-2 system was marketed in 1965 and slowly phased out of production and sales beginning in 1972 and ending in 1973. There was no Model "1" system. These systems can be resold by the user to any buyer and no control can be exercised over subsequent purchasers.

The ID-2 and ID-3 systems are both designed to produce an identification card that includes at least two features incorporated on one half of a Polaroid print: a picture of the individual and an identifying data area. While both systems arrive at this finished product by different means, the Polaroid identification card will always contain a picture and an area for other data. Depending on the system used and its available variations, this card can be

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[1]Document analyst, Metropolitan Police Department, Washington, D.C. 20001.

simply the Polaroid print or it can be encased in different plastic laminates and pouches. It can be on a credit-card-sized piece of plastic, measuring 0.76 mm (0.030 in.) thick, with embossed numbers produced with a Polaroid device known as a "PolaPress." The card can contain other security devices such as a magnetic strip, serialized data card, or "PolaSecure."

PolaSecure is a laminate that contains additional security features such as a state seal that is visible when the light strikes it at different angles. The laminate is bonded to the ID card print through either a chemical or a heat process.

As originally marketed, the identification cards were to be made with Polaroid color film with a film speed of ASA 75. The introduction of black and white film by Polaroid with the same film speed permits these cards to be produced in that medium.

Both systems can incorporate a validation plate in the finished picture area for increased security. The validation plate, manufactured by Polaroid, rests directly in front of the film and its image becomes a third part, in addition to the face and data portions, of the finished card. The plate is manufactured according to the user's specifications and can consist of an official's signature, an institutional seal, or some other unique identifying feature. In the finished card the signature or emblem will appear between one portion of the picture of the individual and one portion of the remainder of the card; it will overlap both and the purpose is to make the substitution of the original portrait with another readily apparent (Fig. 1).

The ID-2 System

This system consists of up to as many as five separate components depending on the user's needs. The first section is a camera head, second is a timer, third is a security laminator, fourth is a die cutter, and the last is a pouch sealer.

The camera head is 483 mm high, 444 mm wide, and 381 mm deep (19 by 17.5 by 15 in.), weighs 21 kg (47 lb), and incorporates lenses, baffles, and mirrors to allow simultaneous photography of the subject, data card, and validation plate, if present. The camera is also equipped with a self-contained electronic flash; a colored background, the subject, and a filled-in data card are all that are needed besides the camera to produce acceptable finished cards on a Polaroid print. In the case described later in this paper the original counterfeit cards were first produced with only this basic camera.

The data card is a standard 80-column tab card that is reduced approximately 31% during the photographic process for security purposes. Any colors contained on the data card are reproduced on the finished identification card. The data card can be produced through normal printing methods by the user or it can be manufactured by Polaroid (Fig. 2).

The camera head is capable of producing two identification cards on one sheet of film and, at the user's option, two identical cards or two different cards can be made at the same time.

As a rule, the camera head rests atop the timer: as the exposed film is manually ejected from the camera head, it drops directly into the top of the timer. The timer is a tall, rectangular box that houses a conveyer belt. The film takes 60 s to move through the box and exit through a side door. At this point it is fully developed and the sandwich of negative and print need only be peeled apart.

The finished print, consisting of two identification cards, can then be inserted in one of the two available security laminators.

The first type of laminator places a laminate only on the photo side; it uses a chemical bond involving no heat and must be applied when the print is first peeled away from the negative after the developing process has been completed. The laminate, possibly equipped with the PolaSecure feature, is designed to deter the substitution of the portrait or data material of one individual with that of another person taken from another card. The laminate is applied to the two uncut ID cards contained on one print.

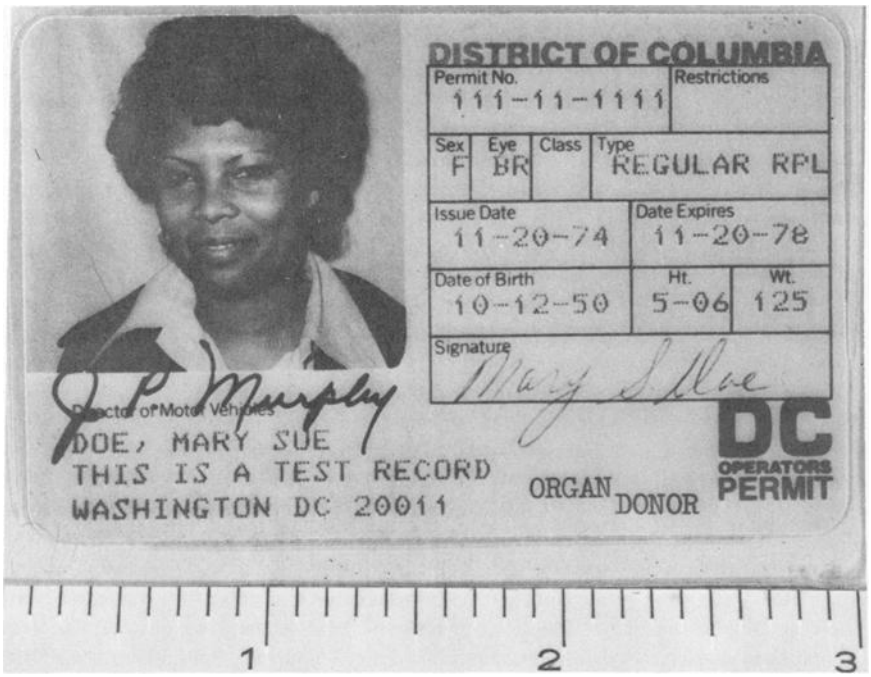

FIG. 1—*Polaroid ID card used by the District of Columbia for automobile operators' permits.*

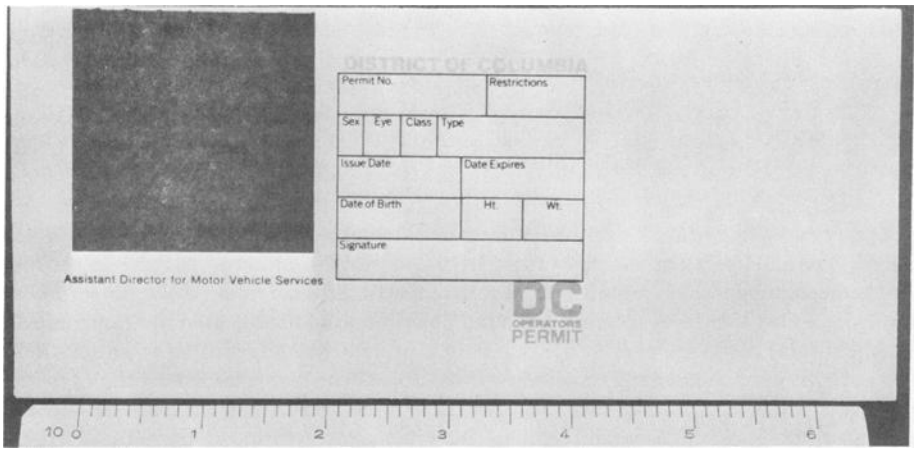

FIG. 2—*Data card portion of an ID card.*

The laminated print is then placed into a die cutter and the two cards are cut from the single print. The individual cut card has rounded corners.

The second lamination method is used for a single identification card, previously cut in a die cutter; through a heat process, a plastic cover is applied to both sides. With this method the plastic laminate can contain printed material such as a restriction code for a driver's license.

The laminates in both methods result in a bond that will destroy the photograph if it is tampered with.

A final step, using the first lamination process involving a chemical bond, may consist of placing the laminated print in a pouch that is then sealed on the fourth side to form an enclosed packet; this may then have a clasp placed in the pouch so that the card can be affixed to clothing. There is no bond between the laminated card and the pouch.

The ID-2 process will always produce a card with a photo area in the upper left area of a horizontal card.

The ID-3 System

Introduced in 1971, this newer product is self-contained within a suitcase-type carrying case that is more easily transported than the ID-2 system. In addition, because of its versatility, it allows a more customized product for the user's needs. Even in a situation requiring a permanent placement, such as in a Department of Motor Vehicles office, the same suitcase operation is used, although it can be bolted to a counter or wired with an alarm. It may use the same data card as the ID-2.

In the basic configuration the camera head is much smaller than the ID-2 camera and now rests atop the suitcase when in use. The front side of the case, facing the subject, is plain; the rear side, facing the operator, contains different built-in devices such as a laminator. The kit may also contain different accessories, such as a die cutter, that can be carried in the case and are placed outside of it during use or, for security reasons, kept in another location. The carrying case is always 584 mm wide, 521 mm high, and 305 mm deep (23 by 20.5 by 12 in.). Overall weights vary according to options but are generally around 23 to 24.5 kg (50 to 55 lb).

Polaroid has given the ID-3 system a 700 series designation with the different subsystems numbered 701 and so on. Briefly, the subsystems all have a camera head, timer or timers, and carrying case. Options are as follows:

701—security laminator, die cutter, pouch sealer
703—PolaSeal laminator, die cutter
704—security laminator (laminate applied only on front of card)
706—dual-bond laminator, die cutter
707—PolaSeal laminator, single-punch die cutter (die cutter is separate from the case)

The newer system differs from the older in the actual process by which the card is produced. The ID-2 relies on a series of baffles and mirrors to produce its finished product. Thus, the camera head is large and bulky. The ID-3 uses a much more simplified process involving a "light valve" system consisting of polarizers contained within the camera head. The light valve relies on the principle that light is prevented from reaching sensitized film if two polarizers are opposed to each other at a 90° angle. The film rests against the validation plate with two polarizers at two different angles, and the data lens and portrait lens are also equipped with polarizers set at different angles. When a picture is taken the data lens' polarizers cancel out any light that would hit the picture area, and the picture lens' polarizers cancel out any light that would hit the data area. While this is a much more simple system than the ID-2, it can result in an unevenly illuminated data area. The polarized plate that rests against the film can also contain validating signatures or logos.

Model Differentiation and Identifying Features

Both systems will produce a photo in the upper-left side of an identification card; the ID-2 can produce a card only in this mode, the ID-3 can be varied. An ID-3 can produce a photo that takes up the entire left side of a horizontal card, from top to bottom, comprising about

50% of the entire card, or a photo that takes up the top portion of a vertical card, again comprising about 50% of the card area. Any other placement of a portrait is possible within the entire card.

Often a shadow visible behind the subject's left ear and left side of the neck is characteristic of an ID-2. However, the shadow depends on the proximity of the background to the subject's head.

The lower-right corner of the portrait area of an ID-2 card will be rounded and the same area of an ID-3 card will be square.

The data portion of an ID-2 card is often more evenly illuminated than that of an ID-3 because of the polarizers mentioned above. Polaroid refers to this shading of the ID-3 data area as a "smile."

If a white line is present between the right side of the portrait area and the data area, it indicates that the card was produced on an ID-3 and is a class characteristic because of the registration of the polarizing plate; it may also be present at the bottom of the portrait area (Fig. 3).

Occasionally an ID-3 portrait of an individual wearing a tie may result in a "bleed-through" into the data area below the tie that looks like a double exposure.

Conversations with personnel at Polaroid, and the author's past experience, indicate that the presence of unique, identifying features that would definitely isolate one machine are few and far between. Occasionally, a validation plate may pick up a random scratch that is unique, but a validation plate can be easily changed from one machine to another within the newer or older series and caution should be exercised in drawing conclusions; only the plate would be identifiable in this situation, not the machine in which it was most recently found. Naturally, an ID-2 plate could not be interchanged with an ID-3 plate and vice versa.

The validation plate may also develop another interesting characteristic, as described in the following case illustration. Machines were obtained legally and illegally and modified to produce a finished card that bore the necessary validating signature or logo. During the examination of one series of cards and the accompanying machine recovered in a raid, it was noted that the identification card carried what, at first glance, appeared to be a legitimate validating signature of the director of motor vehicles for the District of Columbia. Examination of the signature on the questioned permit revealed that it was a skillful tracing and that above and below the signature were unusual lines. The seized ID-2 machine had a validation plate area in which the original authorizing signature, that of the director of recreation, had been scratched off and a piece of transparent adhesive tape, bearing the tracing of the signature of the director of the Division of Motor Vehicles, had been placed in that area (Fig. 4). The outline of the adhesive tape, including the marks left at both ends by the cutting bar on the tape dispenser, became a ready reference point when any newly discovered ID cards came into the office for examination. Apparently because of the effort involved, the tracing on the adhesive tape was used on only half of the validation plate: the lower half of the Polaroid print would be discarded since it lacked this necessary security feature.

Through normal use a laminated identification card may develop a pinhole or other break

FIG. 3—*The white line under the portrait area is a class characteristic of the ID-3 system.*

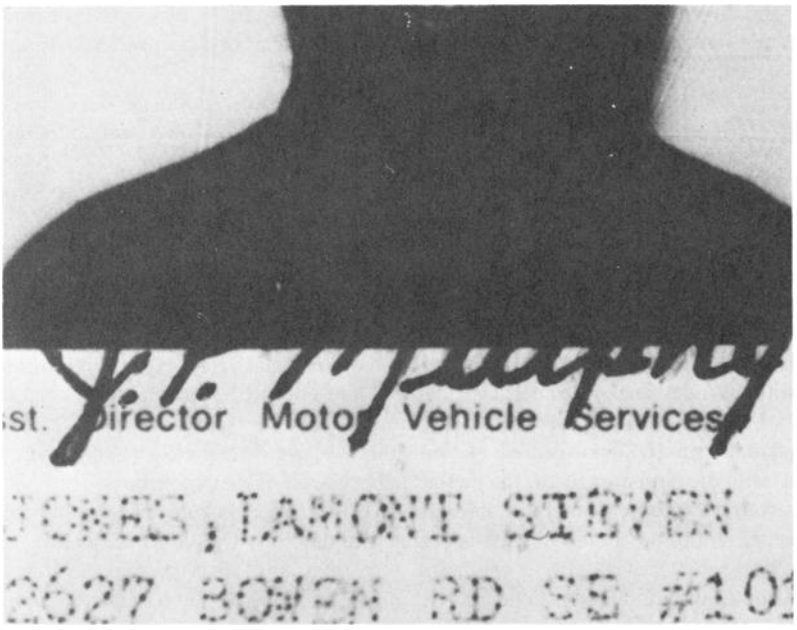

FIG. 4—*The signature on this card is a skillful tracing.*

in the seal. If this card is then immersed in liquid, such as happens when a card is accidentally left in clothes that are washed, the liquid may penetrate the laminate and attack the film, thus producing a distorted image (Fig. 5).

The question was raised by the author in discussions with Polaroid staff as to whether the deterioration of the die cutter's blades may produce identifying markings. Their response was that cutters have been used to 50 000 cycles without failure and that field experience indicated that punch and die wear was insignificant well beyond this. They did say that wear would cause a fuzzy edge on the cards. This fuzziness has been noted during examinations but to this point it has not been consistent in location and appearance and therefore is of no value for identification.

Some tab cards may be printed with a black square in the portrait area to increase contrast in the actual picture of the finished card.

Figure 6 depicts a close-up of the lower right section of a portrait area containing both a round and square corner. The card was forwarded to Polaroid for its evaluation with an accompanying letter asking whether the square corner could have been produced either by a portion of the black square on the data card inadvertently being printed in an incorrect position or by the card being inserted at a slight angle. The response was not definite but suggested that the card was not produced by Polaroid. Subsequently, an examination of sample finished identification cards produced by Polaroid revealed the same phenomenon in one card.

This illustration points up a problem that may be encountered with any company producing a product that may ultimately be examined by a forensic scientist: there is no value to the company, when designing and producing its product, to consider factors such as measurements and identifying characteristics that would be of the greatest value to a document examiner in determining a source of material or identifying one machine to the exclusion of all others. In this case, and ultimately in other related types of examinations, it will be neces-

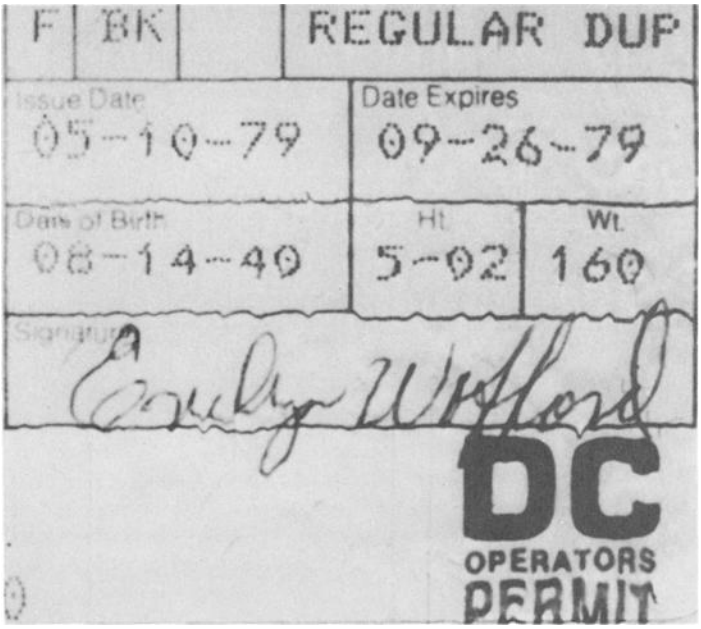

FIG. 5—*Distortions that can occur in legitimate ID cards.*

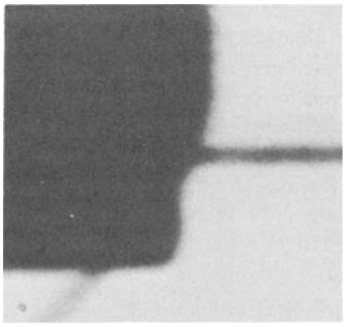

FIG. 6—*Close-up of the lower right corner of a portrait area showing both a round and a square corner.*

sary for document examiners to develop their own body of working knowledge based on past experience.

For general information, examiners working in law enforcement should know that a publication entitled "Drivers License Guide" is published yearly and illustrates all the licenses issued in the United States and Canada, reproducing actual size and accurate colors. However, a critical identifying factor such as the style of type used on a legitimate license may be omitted. In the case of the District of Columbia, the data are typed with a pinpoint style of type, also known as matrix printing. That is one feature, up to this point, counterfeiters have not been able to duplicate, although they have made crude attempts (Fig. 7). Naturally, it is important for an examiner to be aware of a point such as this when conducting an analysis of unfamiliar questioned identification cards.

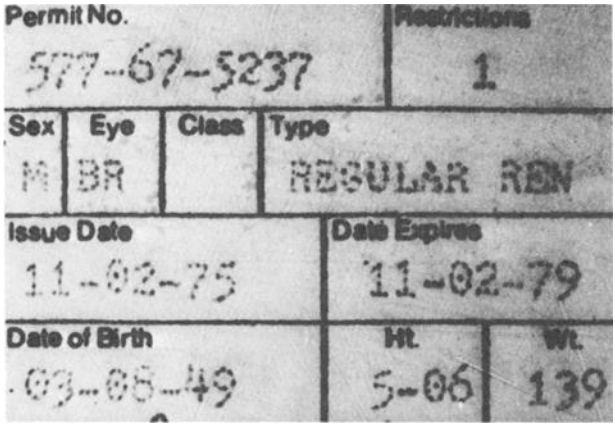

FIG. 7—*Sample of counterfeit matrix printing.*

Case Illustrations

Case 1

The Washington metropolitan area contains local municipalities and businesses, in addition to the federal government, that need identification machines for security and personnel identification. Security of the machinery by the user can range from lax to nonexistent. These two factors have been in existence for several years, but it was only recently that the criminal element became aware of the usefulness of identification machinery and the ease with which it could be obtained.

Throughout this discussion it should be remembered that, for the most part, the identification machinery is the same whether it is used to make driver's licenses or welfare identification cards; the data card, validation plate, and—possibly—security laminates tailor the product to conform to certain user's standards. It is reasonably simple for an employee of an agency to obtain at least the necessary data cards and laminates if poor agency security permits it.

The first illustration involves a group of check passers, now known to number 93 individuals. Approximately three and a half years ago the core group, consisting of three males serving sentences for armed robbery, determined that check forgers were sentenced to substantially less time in prison than those who indulged in armed robbery. Upon their release, the three recruited many more passers and began to commit crimes that included a variety of methods to obtain credit cards and checks, to fabricate identification, and to forge and use these various instruments.

The group ultimately obtained the services of many experienced fraudulent check writers who contributed their working knowledge of various check-passing schemes. These people were highly transient and, for the most part, fragmented in their organization. Their work took them from New York City south through at least Richmond. They would use stolen checks and identification, counterfeit checks, business checks taken in burglaries, and prescriptions either stolen or counterfeited. They would rent cars with stolen credit cards in order to have transportation for their dealings and, ultimately, they would sell these cars to gain additional capital.

The problems presented by the necessity for quickly and easily obtained identification in a variety of names caused the gang to search about for a solution. Over a period of time, counterfeit operator's permits from the District of Columbia of varying quality began to appear. The group at first had only an ID-2 camera head. With this, they produced permits of very crude quality using handmade data cards. Within six months they had apparently obtained one used data card. Microscopic examination of a counterfeit license indicated that a new, apparently homemade, data area was placed over the possibly discarded legitimate data blank. This finding lead to speculation that the card could have been obtained by a member of the cleaning crew or someone else with access to used and discarded cards. At about this point stolen security laminates were found on counterfeit cards; these were merely placed over a Polaroid ID card that had been cut out of a print by hand. Obviously, the gang had yet to obtain the remaining components, including a validation plate with an appropriate signature, and they could not yet seal the laminate onto the print. It was only a matter of time before the remaining components were acquired illegally and legitimate data cards for the operator's permits were obtained from an unknown source. With nearly all of the necessary components, and the simulated official signature mentioned previously, they could produce a counterfeit card that lacked only the pinpoint style of type.

When a legitimate operator's permit was stolen, the gang would find a member who roughly matched the physical description on the valid permit. A counterfeit card would then be produced by the gang for the payee names on any stolen checks and for the name on stolen credit cards. In the event that a gang member was stopped by the local police and a computer query made, it would be reported that the permit number, address, and physical description were valid information.

As ID systems were seized in raids the gang would obtain other ones from various sources in burglaries. In one raid the material recovered indicated that the group was attempting to duplicate the Metropolitan Police Department's Polaroid ID card.

Case 2

The second case illustration involves an individual who legitimately purchased an ID-3 system for use in his printing business. Information was received by the police that the owner was issuing counterfeit operator's permits. When the raid was conducted it was found that

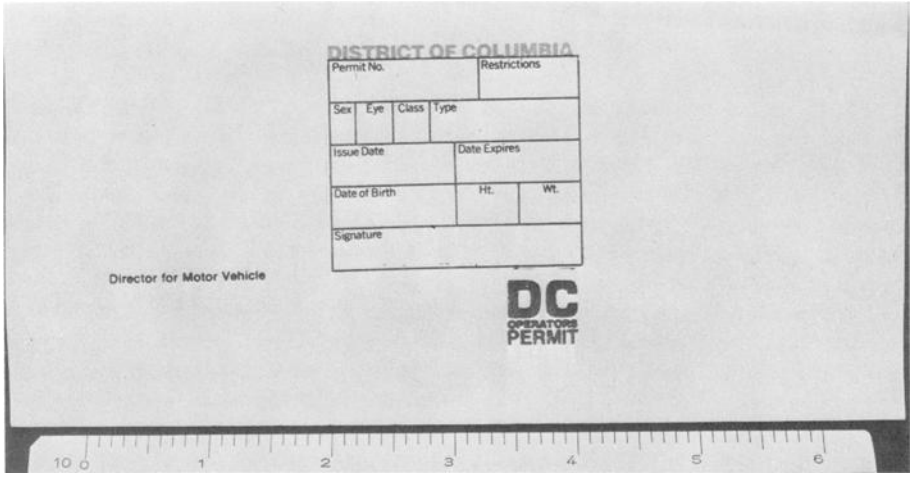

FIG. 8—*Counterfeit data card.*

counterfeit data cards had been produced that included the same colors, printing type style, and lines as those used by the District of Columbia for its operators' permits (Fig. 8). When this data card was reduced the normal 31% and reproduced as an identification card it would probably be accepted by most merchants and others although it lacked the matrix printing and security laminate.

Obviously, if a group or individual has possession of an ID-2 or ID-3 he has only to duplicate ancillary items such as a validation plate, data cards, and customized plastic laminates. In order to thwart the loss of data cards and laminates increased accountability must be implemented, and control should be exercised over discarded cards. Security procedures may involve the serialization of data cards and laminates and increased protection of supplies. The production of a spurious validating signature is a relatively simple process, as was discussed.

Address requests for reprints or additional information to
John I. Kraemer
Metropolitan Police Department
300 Indiana Ave. NW
Washington, D.C. 20001