

# THE SUBMINIATURE TIMES

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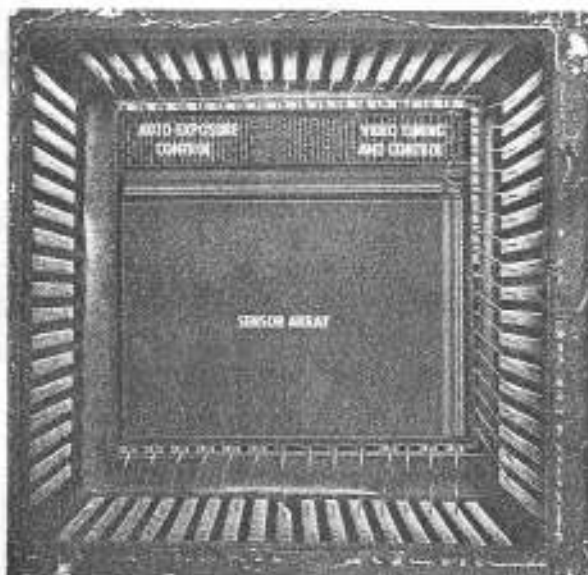
## VIDEO IMAGE ON A CHIP

A complete low-cost video camera sensor and its circuits on a single fingernail-size chip could expand and improve the applications of electronic "eyes" in homes and businesses, say researchers at the University of Edinburgh in Scotland. An inexpensive single-chip camera would allow electronic eyes throughout the house to monitor the front door, a sleeping baby, or dinner cooking in the kitchen, all from the family TV. The researchers designed and tested such all-in-one circuits, and they expect these cameras would cost less than \$40. "To our knowledge," note the researchers, "all previously developed video imagers require one or more boards of surface-mount components" to provide the functions built into this one-chip camera.

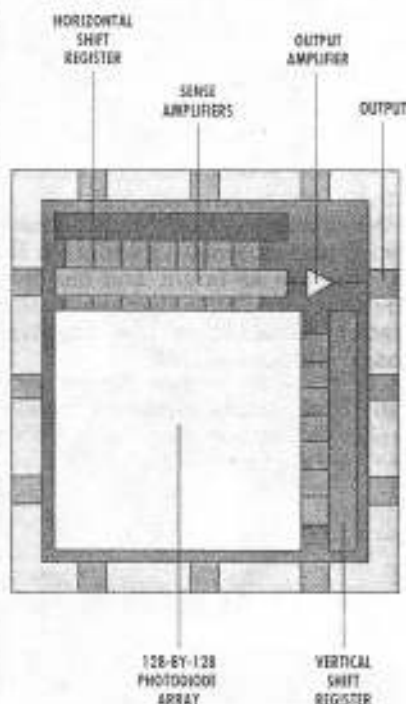
The chip could also be used for security systems, vehicle detection and traffic control, "seeing" industrial robots for automated assembly, night-vision equipment, portable video telephones, and vision toys such as model aircraft.

The camera chip, just 0.4 inch square, has a rectangular array of some 90,000 light-sensitive photodiodes, combined with 4,000 circuits that process picture signals. A capacitor connected to each photodiode is charged with a fixed voltage. These charges are reduced in proportion to the intensity of the light falling on the diodes. The rows and columns of photodiodes are scanned to form the video-output signal, which is processed and amplified by other chip components. Each capacitor is then recharged to its initial value. A self-test function is included in the chip, and a single five-volt supply provides power.

The camera chip requires only a cheap optical lens, which was also developed at Edinburgh. An automatic-exposure circuit eliminates the need for a variable-aperture lens system. A British remote security monitor will be one of the first products in the United States based on the chip.—David Scott



Electronic exposure control is built into the 312-by-287-pixel chip, above, along with the control circuits of an earlier chip (below).



# I SPY

**TOP SECRET**

Things aren't what they seem if you're shopping for surveillance gear for your next covert mission.

## Q's

EQUIPMENT LAB

BY REBECCA DAY  
PM Photos by Bill Ashe

● A Mercedes rolls up to the Plaza Hotel in New York just before sunset. A well-dressed man steps out of the car into a slight drizzle, umbrella and briefcase in hand. Raising his umbrella, he comes around to the passenger side of the car and opens the door for his elegant wife, who, in diamonds and heels, commands the attention of anyone within 30 ft. They enter the hotel seemingly oblivious to everyone.

Things are not quite the way they seem to be, however. Our Ms. Bond, behind sunglasses with built-in rearview mirrors, watches their back as she ascends the steps. To the casual observer she appears to be fumbling through her purse as she walks. In actual fact, she is fingering the dial on her lipstick canister to expose a 1-in. blade and then



places it next to the comb knife in her purse. Also in her purse is an electronic lock pick just in case they need to get through a locked door quickly.

Our Mr. Bond moves a little stiffly as he climbs the stairs—4 pounds heavier in his bulletproof vest. The umbrella is also bulletproof, the better to shield Ms. Bond in an emergency. Once inside the hotel lobby, he sets down his briefcase to collapse the umbrella. An overzealous bellman picks up the briefcase to move it out of the way. Without waiting for an explanation, Mr. Bond calmly reaches into his pocket for a remote transmitter. At the push of a button, the bellman's hair becomes live wire, courtesy of a 50,000-volt jolt from Bond's shocking briefcase. The briefcase is dropped instantly.

The moment passes. Briefcase safely in custody, our couple seat themselves at a table facing the door. Our Mr. Bond discreetly takes out his dual-purpose ballpoint pen, extends the antenna and makes a quick sweep of the dining room to detect any radio-frequency bugs. Ms. Bond activates the audio recorder in her cigarette box, places it on the table, and they wait for the scheduled rendezvous to begin.

The scenario may scream Hollywood, but you'd be amazed at what goes on these days as everyday people turn spy in games of adult hide-

## WRISTWATCH CAMERA

## PEN BUG ALERT

and-seek. Business people documenting meetings, journalists traveling overseas, parents protecting their children from kidnappers, office workers wanting to document claims of sexual harassment and law-enforcement personnel trying to outwit the bad guys—all are clients of stores like Quark Research Group and The Counter Spy Shop. Aptly named, these New York City one-stop spy centers sell everything from book safes for hiding jewels to camera-equipped dolls that monitor the babysitter.

We did a little sleuthing of our own at these stores, sniffing out the more popular novelty items as well as the hardcore, double-agent-type products. Visiting these stores is like going to Q's spy lab in a James Bond film.

For instance, what headwear collection is complete without a pair of night-vision goggles? Quark's Star Scope and the NightViewer pocket-scope (\$1500 and up) give you night sight. Quark claims light intensification of 20,000 times

for Star Scope, which is easily mounted onto most SLR and video cameras to provide a lux capability camcorder makers dream about. NightViewer's monocular lens uses an infrared-emitting diode to send out IR energy that can only be picked up by the night-vision goggles.

Although vests are the most common article of clothing for bulletproofing, there's really no limit to what you can have done.

Most bulletproofing is done with Kevlar, a rel-

## CIGARETTE BOX RECORDER

atively lightweight material that can withstand bullets from handguns and fragments from exploding bombs, Quark says. If you need more protection, The Counter Spy Shop's steel-reinforced vest will reject fire from an AK-47, according to store operations manager Elan Jamil. The metal backing may add 15 pounds to the scale, but "it's lighter than a coffin," he says.

Surveillance gear is big at spy stores, and you'd be amazed where cameras are showing up. See that guy in the sunglasses? Look closely at the bridge of the glasses and you can see he has three eyes, not two, with his video sunglasses (\$6000 and up). All you see is a 1/2-in. opening in the glasses, but inside is a 1/4-in. CCD video camera. Tiny

## DIGITAL CELLULAR PHONE SCRAMBLER



cables in the glasses' sports strap connect to a belt-worn power supply and from there to an 8mm recorder in a belly bag.

You can monitor your bedroom in the same way with the clock-radio surveillance kit. A tiny 1/8-in. CCD video camera picks up images over a 78° field of view and can deliver them in color or black and white to a time-lapse recorder or to a monitor. A sensitive, omnidirectional microphone and preamplifier are also housed in the radio (\$450 and up) for audio monitoring.

For times when video surveillance is overkill, the wrist-watch camera (\$275 and up) might do the trick. Known as a document camera, the camera watch takes color or black-and-white photos using Minox film. Press what looks like a typical

#### VIDEO GLASSES

knob on the side of the watch, and you have a picture of important evidence. The Quark watch comes with its own developing kit and instructions.

Phantom ear mikes (\$600 and up) are popular with Secret Service wannabes who need 2-way communication capability without

#### MONOCULAR NIGHT VISION (CAMERA ADAPTABLE)

the obvious look of walkie-talkies. Wired sets give you an authoritative look, while wireless versions are for concealed communications. The ear mike communicates with a transceiver that's hooked onto your belt or stowed in a pocket to give you 2-way hands-free communication.

Scramble your cellular phone calls to protect your number and conversations from eavesdroppers. Hide a knife in a

#### KNIFE IN COMB

pen, a letter opener or a watch. Record conversations from up to 50 ft. away with a tape machine in your pocket. There's a lot of it going around. Surveillance and protection is a \$500-million-a-year business, according to Gregg Graison, vice president of Quark Research Group. However, the people buying it are responsible for assessing the ethical and legal implications. Anyone getting into the spy game is well advised to learn the do's and don'ts first. Failure to do so can result in stiff penalties. **PM**

#### BODY ARMOR (VEST) AND EAR TRANSCEIVER

#### LIPSTICK KNIFE

#### ELECTRONIC LOCK PICK



## Time Exposure

continued from page 5

colored ones could have been relatively late in that camera's history. My guess is that they come from the mid- to late 1920s, when another style of colored Expo was produced.

Anco was the first company that could definitely pin down a date for the production of a colored camera. In their 1924 catalog, they listed three colored cameras ("Specials" they called them): the No. 0 *Buster Brown* and the No. 2 and 2A *Ancoas*.

All three of these cameras were "sport models covered in red, with lacquered brass trimmings." They were sold for 50 to 75 cents more than the basic-black versions. These cameras were produced through about 1929.

Another box camera of the period was the Anco *Kiddie* camera, a small, simple red box camera which took 127 film.

In the 1928 Anco catalog, the Anco *Vanity* camera, "an all-metal camera, offered in several beautiful colors, with gold-color trimmings," was listed. Among the colors offered were orange, red, blue, and green. It was claimed to be the "original and genuine 'Vanity' camera," and to have been introduced around 1925. It was discontinued around 1929, not long after Anco was acquired by Agfa.

Not that the Agfa-Anco union stopped the production of colored cameras. The Anco *Royal* cameras, "covered in genuine golden-brown ostrich-grain leather," were introduced in 1929 and made for a few years. A line of colored box cameras was also produced, starting with the "duotone mocha" *Vogue Model Antar*, ultimately also appearing in green, tan, blue, and red.

While the beginnings of the line of "coloured" camera models of the British firm of Ensign were not that colorful, ultimately their cameras blossomed forth. Their *Box Ensign* of 1926 was made available in either brown or black leatherette. These cameras were produced at least through 1932, but were discontinued soon afterward.

The *Duo-Ensign*, so called because of its provision for a close-up lens, appeared around 1930 in black, blue, and red, and lasted at least three years. The box-form *All-Distance Ensign* of the early 1930s had a crystalline enamel finish and nickel-plated fittings. It was available, with matching limp-leather case, in black, red, blue, and brown. The *All-Distance Pocket Ensign* was the folding counterpart of the box model.

Another small box-type camera which

appeared in colors was the *Expo Easy Load* of the late 1920s. It used a novel cartridge-load principle first introduced on the *Expo Watch Camera* and it was made in black, red, green, tan, and silver.

Without question, the colored cameras produced by Eastman Kodak Co. were the most numerous and widely advertised. A variety of folding and box models was produced from 1928 to 1934. Because of space limitations, I'll only list some of the most prominent ones here. Kodak advertised the *Vanity* models (1928-1933) as "distinguished, dainty, feminine," and claimed, "Bryn Mawr, Wellesley, Vassar, Smith '28 join Park Avenue debutantes in acclaiming these gloriously colorful Kodaks the loveliest gift creations." They were made in "Bluebird, Jenny Wren, Sea Gull, Cockatoo, and Redbreast." For their introduction, the *Brownie* box cameras (1929-1933) appeared in brown, gray, blue, green, and red.

Among other notable colored Kodak cameras were the vest-pocket *Rainbow Hawk-Eyes* (1929-1934, in orchid, marsh green, steel blue, and rose); box models (1930-1933, in vermilion, green, blue, and maroon); the extremely popular vest-pocket *Kodak Petite* (1929-1933, in green, lavender, old rose, gray, and blue); and the *Beau Brownies* (1930-1933, in blue, green, black, tan, and rose with a two-tone Art Deco enameled front).

The Coronet Camera Co. (Birmingham, England), noted for its simple box and folding cameras, listed a series of *Vanity Coronets* in red, green, blue, black, and light brown, in their 1929 catalog. Coronet also offered colored "vanity" cases for Coronet, Brownie, Folding Pocket Kodak, and Ensign cameras.

Two other colored cameras of the early 1930s that were briefly produced and little known were a red folding *Ihagee* camera (ca. 1930) and the Japanese *Color Pearllette* (1932), which came in in brown, blue, and gray.

Two mid-1930s colored cameras were the Coronet *Midget* and the *Nomar*. The molded-Bakelite subminiature *Midget*, made in New England, was introduced in 1935 in green, rose, walnut, and black. In 1936, a blue model was added to the line. They were discontinued in 1938 or '39. The American-made *Nomar* was a metal box camera which came in black, green, red, and possibly other colors; little is known about it.

The *Falcon Midget 16*, a cardboard box camera for 127 film, probably appeared in the early 1940s and was made in at least black and green. Another camera which I believe to be pre-World War II, is the *Merlin*, made by Britain's Unit-

ed Optical Instruments. I have been told this tiny cast-metal camera came in two or three colors in addition to the black one I have.

Among the early postwar colored cameras was the Universal Camera Corporation's subminiature *Micro 16*. Besides the regular silver model, they were available in blue and (I believe) green.

From the 1950s we have the little Italian *Ferrania Rondine* (ca. 1951-1954), a box camera for 127 film that came in black, tan, red, green, and blue. The first model of the subminiature *Minolta 16* (1951-1960) was also produced in colored versions (silver, black, red, gold, green, and blue), although it is uncertain in which years they were.

The Shaw Harrison-made round-cornered, molded-plastic box camera, the *Sabre*, also appeared in colors in the late 1950s. I have examples of red, green, and tan in my collection.

An additional colored camera of the 1950s was Kodak's *Brownie Starflash* (1957-1965) for 127 film. It appeared in black, blue, red, and white. A little metal box camera, the *Swiss Box*, made by E. Suter in red and black, may also date from the 1950s.

It is not surprising that a camera should have been produced in red, white, and blue during our bicentennial celebration. This was Polaroid's *Electric Zip* (1975-1978). A black version was also manufactured.

And now we come to the most recent of the colored cameras. In 1980, Konica introduced the *EF3*, a 35-mm camera with built-in flash, in five colors: high-gloss red and white, metallic blue and gold, and "traditional black." In 1982, Canon introduced the compact, low-cost 35-mm *Snappy 20*. With automatic exposure, fixed focus, built-in flash, and a plastic body, the *Snappy* comes with a red, yellow, blue, white, or black faceplate.

And now that the disk cameras have been on the market for over a year, we find that this format has gone colorful. Haking, who makes cameras under the Anco name, announced at *photokina '82* (POPULAR PHOTOGRAPHY, January, 1983) that the Anco *HR 30* disk camera will be produced in red, black, metallic blue, silver, charcoal gray, and "champagne."

I'm sure that I probably missed some of the makes of cameras that were produced in colors, and would appreciate hearing from you readers about any omissions. My thanks, incidentally, to Artie Warren of Brooklyn's Warren Camera for lending me the Canon *Snappy* used in the accompanying photo. ●