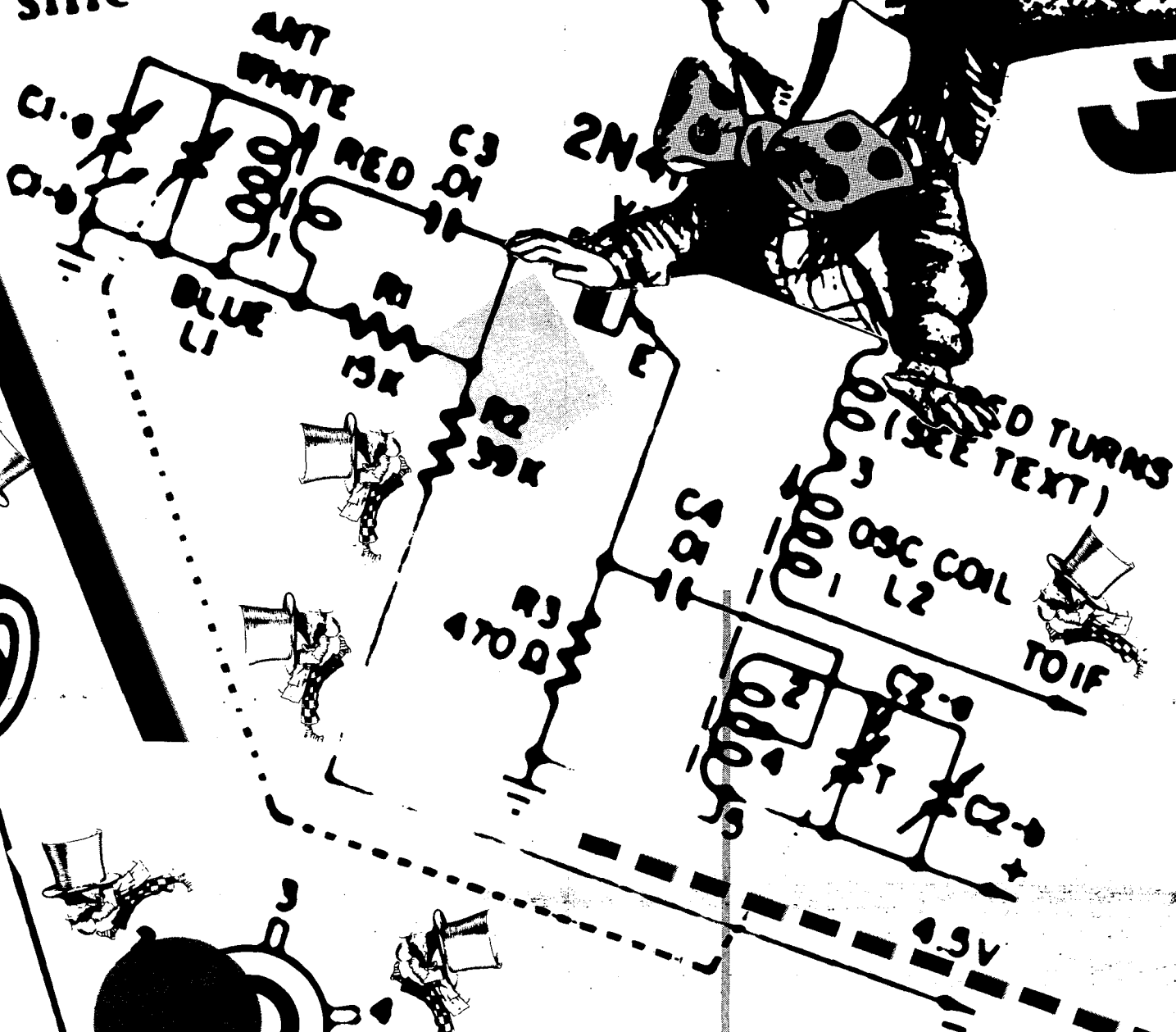


VOLTAGES that vary and repeat themselves are often needed in electronics. Square wave pulse are among the recurrent the sine and square wave



By Dan MacLeod

The needle on the meter was swinging back and forth when it wasn't supposed to. For some reason it was registering on the table in the conference room, nowhere near the mercury out on the shop floor.

A young man wearing a jacket with a large union emblem on the back hunched over the meter, twisting the dials. To one side sat a tiny, middle-aged woman also wearing a union jacket. The name "Joan" was embroidered above her breast pocket.

"What's the matter, Steve? Don't you know how to run that thing?" Her face was flushed, her voice tense. She'd been giving him little digs ever since picking him up at the airport that morning.

Steve let out a deep breath, concentrating on the meter. Her antagonism didn't make sense, he thought. She was the union president in the plant and had asked the international union for his help in the first place.

On the other side of the table sat Warner, the manager of the small electronics plant. He stood up, paced a few steps and growled, "I don't know if we should even let him in the plant. The mercury readings we take have always been normal."

"Just hush, would you, Warner?" Joan said quickly. "It would settle a lot of our concern if the union's expert could come up with a good reading too. Besides, it's in the contract—you have to let him in."

Warner plunked his heavy frame back down into the chair and flipped through his papers. "Let's get this show on the road. The morning's already half gone."

Steve apologized. "Something's wrong. I can't get it to zero in." Sweat appeared on his forehead. He hadn't let on, but he had actually never used a mercury vapor meter before. He had borrowed this one from an OSHA office and it had seemed simple enough when they showed it to him then. He wondered if maybe it had broken on the flight.

He had brought it along partly as a prop to intimidate the plant's management. But as both Joan and Warner lean-

ed closer to watch him fidget with the dials, he was beginning to think it wasn't such a hot idea.

"Maybe the smoke in here is interfering," he said. "I'm taking it outside."

He carried it to the sidewalk in front of the plant, glad to be alone so he could figure out how to run the meter. In a few minutes, the needle settled down. As he walked back through the office area, he noticed the needle jump again. Just cigarette smoke, he thought, his confidence restored.

They started the inspection. Joan led the way, pointing out her concerns, glad to have someone listen to her problems. Warner trailed at her heels, nervous and defensive, telling of all the improvements he'd made in recent years.

They walked into the main area of the shop, a large room filled with rows of workbenches. Side by side along these benches sat about 50 women assembling electrical switches.

The shop looked clean and well-ordered and was surprisingly quiet compared to most plants. A trace of rust-proofing oil could be smelled in the air and fluorescent lights shined overhead, blanching any colors from the room.

Steve held the meter in front of him like a uranium prospector with a Geiger counter. The needle rose slightly as he walked toward the benches.

"Where do you work, Joan?" he asked.

At a factory where mercury is used, things grow curiouser and curiouser

"Over here," she answered as she brought him to a workbench on the other side of the room. "It used to be a mercury job, but they changed it about a year ago, so it isn't anymore. I can't imagine what you're gonna find."

Steve put the meter to the bench and the needle swung up three quarters of the way to the danger level. He looked closely at the bench surface. Inside the crevices were drops of silver.

"Did the mercury ever spill?"  
"All the time. It would run along the

bench. Sometimes onto the floor."

Steve put the meter to the floor and the needle rose. Lines of mercury glittered in the cracks and chips of the cement. "Mercury evaporates," he said, "even at room temperatures. You breathe in the vapors."

"We use a power sweeper here every day," Warner said, pacing back and forth.

"That probably just stirs it up more," Steve replied as he started to show the reading to Joan. Warner interrupted him again. "That's a normal reading."

Steve looked at him. "It's within the OSHA limit, but it's not normal. Normal is zero. Besides, there's studies that show the OSHA limit is too loose. We use a recommended limit of less than half of OSHA's—that's half the danger level on the meter."

Joan added, looking worried, "You know it would have been higher when we used the mercury here."

Steve walked along the bench taking readings from time to time. Most of the women did not look up. The few who did

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