

INTRODUCING THE FAST WORKING COUNTERS FROM HICKOK.



**Four affordable, deluxe
counters—one for every need.**

MODEL 380. 1 Hz to 80 MHz, 10 ppm	\$259
MODEL 380X. 1 Hz to 80 MHz, 1ppm	\$385
MODEL 385. 1 Hz to 512 MHz, 10ppm	\$499
MODEL 385X. 1 Hz to 512 MHz, 1ppm	\$625

Perfect for communications, CB, audio and digital work, servicing and laboratory applications.

Full 7-digit display with automatic decimal, full autoranging. SPEED READ mode updates display 5 times each second to aid tuning and adjustments.

Resolution is 1 Hz to 10 MHz, and 10 Hz to 80 MHz. Models 385, 385X feature a built-in prescaler to take you all the way to 512 MHz. Models 380X, 385X incorporate temperature compensated crystal oscillators with 1 ppm accuracy.

See these exciting new counters at your distributor now!

HICKOK

the value innovator

INSTRUMENTATION & CONTROLS DIVISION
THE HICKOK ELECTRICAL INSTRUMENT CO.
10514 Dupont Avenue • Cleveland, Ohio 44108
(216) 541-8060 • TWX: 810-421-8286

Circle 7 on reader service card

letters

AMERICAN TV STANDARDS

I note with horror that the changing of American TV standards is being seriously considered ("Looking Ahead", February issue). While it is true that the present system was developed in the middle 30's and the color system added to it in the early 50's, the system isn't all that bad. Consider:

- The information bandwidth in the present system is 4.2 MHz. Color sets normally pass about 3.5 MHz of it; black-and-white sets more like 2.5 to 3 MHz.
- The color signal consists of two variables, called I and Q, corresponding more or less to red-blue and green-purple separations. The I signal bandwidth is 1.5 MHz, the Q is 500 kHz. Most sets use 600 kHz for both.
- The soundtrack is required to have frequency response from 50 to 15,000 Hz—the same as "hi-fi" FM. Most sets come with amplifiers and speakers of quality similar to that of a portable transistor radio.

Clearly, if receiver manufacturers were convinced that the people would pay more for higher quality, they'd make sets that could take full advantage of this 25- to 35-year-old set of standards. Such a set wouldn't cost much more. But there are a few other reasons, all due to the TV stations and the networks:

- Many programs are on film, which has an inherent contrast limit compared to TV—film does not look "live." Most film uses an optical sound system, developed in the twenties. The frequency response, distortion, and signal-to-noise ratio are decidedly inferior to that of the transmitter.
- Networks limit audio frequency response from any source to about 200 to 5000 Hz, and signal-to-noise is well below the transmitter capability.
- Network shows delayed for viewing in the western half of the U.S. are played back one generation down, no matter what the source. This often causes color banding, usually seen as stripes of off-color or color contrast changes, especially in the red hues (which include most skin tones).
- Local newsfilm is 16 mm or super-eight, with the limited resolution already mentioned. Some improvement is made on the audio track of super-eight by use of magnetic recording, but it is partially offset by the even slower film speed.
- Electronic news-gathering (ENG) equipment, which uses videotape instead of film, uses less than one-fourth of the capability of the television channel, since the increased bandwidth would increase

the complexity, size, weight, and cost of those items.

• Almost all pay-TV "movie packages" are played from videocassettes, which have less than half the resolution the channel can provide. This degradation is obvious on almost any receiver.

If we were to go to a 1000-line system, we would no longer be compatible with Canada, Mexico, or Japan, just to name a few, and anything we presently have on videotape would be obsolete—we could scan-convert it, but that wouldn't improve it. The thought of "Let's Make A Deal" on a 10-foot screen makes me ill. Incidentally, the main resolution limitation on our present system is in the vertical direction, since that's across the lines, while the horizontal is continuous. Vertical resolution could be doubled by going to a 4:1 interlace instead of the present 2:1, and still be compatible with all the TV sets in the country. Such an arrangement could be switched on and off at will by the TV station, FCC consenting.

Let's hope that nobody's serious about all this. Look at the picture from an Advent 7-foot screen projector set—it ain't half bad. And there's always the movies.
JAMES REIGER
Ridgecrest, CA

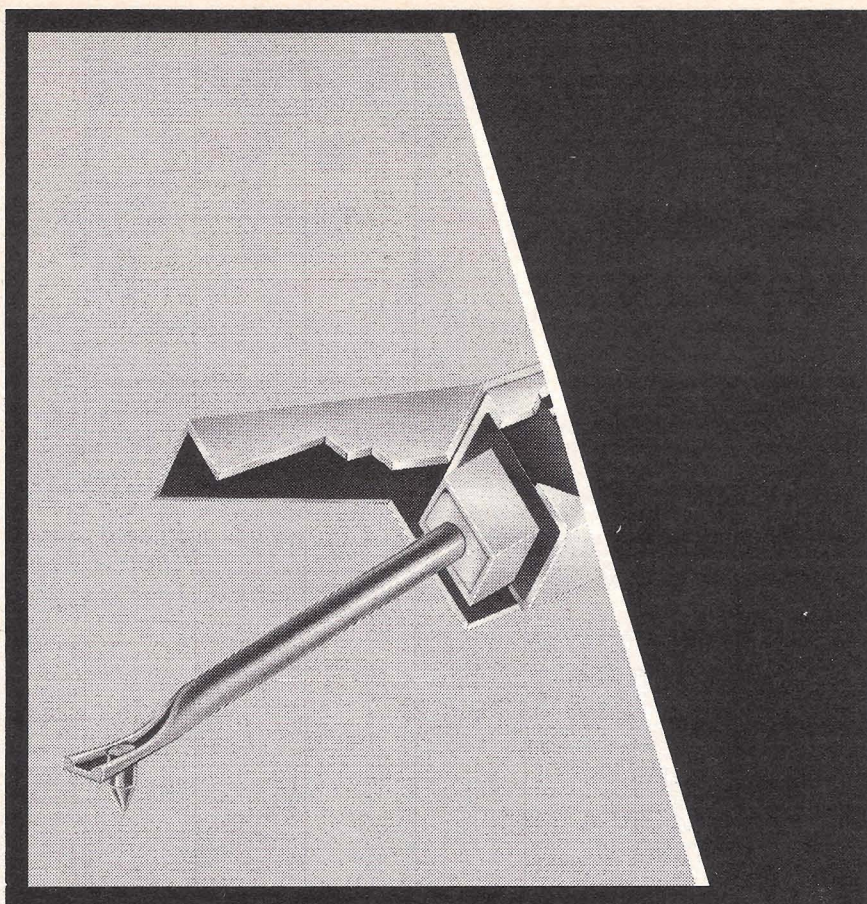
COMPUTER HOBBYISTS

To me, the most critical thing in the hobby market right now is the lack of good software courses, books and software itself. Without good software and an owner who understands programming, a hobby computer is wasted. Will quality software be written for the hobby market?

Almost a year ago, Paul Allen and myself, expecting the hobby market to expand, hired Monte Davidoff and developed Altair BASIC. Though the initial work took only two months, the three of us have spent most of the last year documenting, improving and adding features to BASIC. Now we have 4K, 8K, EXTENDED, ROM and DISK BASIC. The value of the computer time we have used exceeds \$40,000.

The feedback we have gotten from the hundreds of people who say they are using BASIC has all been positive. Two surprising things are apparent, however. 1) Most of these "users" never bought BASIC (less than 10% of all Altair owners have bought BASIC), and 2) The amount of royalties we have received from sales to hobbyists makes the time spent of Altair BASIC worth less than \$2 an hour.

Why is this? As the majority of hobbyists must be aware, most of you steal
(continued on page 16)



This...protects your most expensive hi-fi investment.

Recognizing that a penny saved is a penny earned, may we suggest that trying to economize by putting off the replacement of a worn stylus could be like throwing away five dollars every time you play a record. (Multiply that by the number of records you own!) Since the stylus is the single point of contact between the record and the balance of the system, it is the most critical component for faithfully reproducing sound and protecting your record investment. A worn stylus could irreparably damage your valuable record collection. Insure against this, easily and inexpensively, simply by having your dealer check your Shure stylus regularly. And, when required, replace it immediately with a genuine Shure replacement stylus. It will bring the entire cartridge back to original specification performance. Stamp out waste: see your Shure dealer or write:



Look for the name SHURE on the stylus grip and the words "This Stereo Dynetic® stylus is precision manufactured by Shure Brothers Inc." on the box.

Shure Brothers Inc.
222 Hartrey Ave., Evanston, IL 60204
In Canada: A. C. Simmonds & Sons Limited



Manufacturers of high fidelity components, microphones, sound systems and related circuitry.

Circle 9 on reader service card

LETTERS

(continued from page 14)

your software. Hardware must be paid for, but software is something to share. Who cares if the people who worked on it get paid?

Is this fair? One thing you don't do by stealing software is get back at MITS for some problem you may have had. MITS doesn't make money selling software. The royalty paid to us, the manual, the tape and the overhead make it a break-even operation. One thing you do do is prevent good software from being written. Who can afford to do professional work for nothing? What hobbyist can put 3-man years into programming, finding all bugs, documenting his product and distribute for free? The fact is, no one besides us has invested a lot of money in hobby software. We have written 6800 BASIC, and are writing 8080 APL and 6800 APL, but there is very little incentive to make this software available to hobbyists. Most directly, the thing you do is theft.

What about the guys who re-sell Altair BASIC, aren't they making money on hobby software? Yes, but those who have been reported to us may lose in the end. They are the ones who give hobbyists a bad name, and should be kicked out of any club meeting they show up at.

I would appreciate letters from any one who wants to pay up, or has a suggestion or comment. Just write me at 1180 Alvarado, SE, #114, Albuquerque, New Mexico 87108. Nothing would please me more than being able to hire ten programmers and deluge the hobby market with good software.

BILL GATES

General Partner, Micro-Soft
Albuquerque, NM

OOOOPS!

In your February, 1976, Komputer Korner example on page 88, it appears that you have mixed up your architecture and the direction of the moves.

With architecture B; to move A to output requires:

- 02 (move A to C)
- 07 (move C to output)

But if C contains needed data, the instructions should be:

- 06 (move C to B) not B to C
- 02 (move A to C)
- 07 (move C to output)
- 04 (move B to C)

PHILLIP L. EDELSBERG

Systems Analyst
Indianapolis, IN

R-E

DON'T MISS THEM!

This month's hi-fi test reports include two stereo receivers. One is the Marantz model 2325 and the other is Lafayette's model LR-2200. See how these two receivers match-up against each other. Turn to pages 50 and 56 for the complete story and full specifications.