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center, relaying traffic to W9MNG who in turn relayed it to Madison. WA9GJD and WA9HXR had set up an emergency communications center on French Island and were handling traffic on both 2- and 75-meters. An additional 75-meter station was required at the city hall, and was set up by the evening of April 19 with WA9HXP and W9ZZI as operators, and W9OOL was used to relay traffic to Madison. On the evening of April 20, K9ZUY took over as NCS from W9PJ/9, while W9GPU and W9VRI acted as back up operators in case W9PJ was forced off the air. On French Island, the FAA had requested a 2-meter link between the airport and telephone company, where the AREC had its control center. Operation continued 'round the clock until April 22, the flood crest having passed on April 21, when operation was reduced to daytime only until April 25, when the amateur's services were no longer needed. During the entire course of the operation, many amateurs split their time between AREC and Navy MARS which was also activated.

Many of the reports indicated that officials in the areas that amateurs served were grateful for the many hours spent and the tireless efforts of the amateurs. Well done, fellows and gals! QST

High-Speed Code

BY KATASHI NOSE,* KH6IJ

The person who wishes to become proficient in the art of c.w. today will be hard put for practice unless he turns to the amateur bands or that rare press station still serving primitive areas.

Before the advent of the teleprinter, one could get excellent practice from any of the press or point-to-point stations. Monitoring the radio spectrum today will convince you that c.w. is no longer used as a means of handling high-volume traffic.

Lest you think that I am writing strictly as an amateur, let me say that I have had considerable experience copying high-speed press news on contract. A press contract meant that I had to produce a certain volume of copy per day. I hit upon the scheme of transcribing the c.w. on a dictaphone (meanwhile tuning to another broadcast) and later playing it back at a higher speed. The pitch was high but I could get off more copy in a shorter time. I could eliminate the deadwood ("thinkpieces") and concentrate on the hot news, but best of all I could raise my code ceiling.

Sending

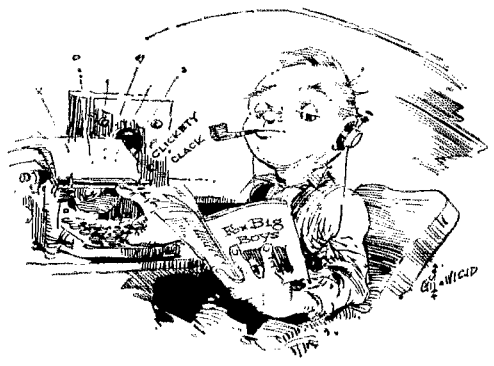
I must admit I cannot copy some of the so-called high-speed stuff being sent sometimes by the "no-weight" artist. The dots are adjusted for 50 w.p.m. but the dashes are loafing along at 25 w.p.m.

The electronic key has done much to eliminate this menace but even this device is subject to stylized sending, through mis-spacing of the letters. An electronic key in the hands of a skilled sender is a joy to listen to. Old timers remember the "Lake Erie" and the "Banana Boat" swings, but like an accent, eventually one got used to it. The electronic key has eliminated this type of accent.

Many schemes have been proposed to keep the bug anchored down, ranging from suction cups to sandpaper. I contend that such schemes are for the slow sender. At high speed you cannot afford to put much force on the paddle. If you move your whole arm, the law of inertia prevents you from attaining high speeds. Pivot on the knuckle of your small finger and use only finger action and a rolling-wrist motion. If your fingers or arms begin to ache after a spell, you are straining too much.

Learn to relax by sending while holding a pencil or pen in the same hand and fingers you use for writing. This eliminates that wasted motion of picking up a pencil and laying it down when working a contest. Imagine picking up and laying down a pencil 6000 times, which is what you would do during the course of a hot contest!

If you have already mastered a bug, it will take about three weeks to convert to electronic-key sending. Once you are converted, you are hooked because now your bug fist is ruined; an entirely different technique is required. The elec-



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tronic key requires that you cut short the dash and quickly go over to the next character. It also makes the dashes for you. Therefore, you will have a tendency either to stick on the dash side or to send too-short dashes when you go back to the conventional bug.

For those breaking into the higher speeds, I recommend an electronic key because the results are professional-like.

Maximum Hand-Copy Speed

During the early part of my amateur career, I developed the art of listening in my head, mainly to save scratch paper. I quickly progressed to a point where I could copy in my head but was unable to put it down on paper or typewriter, an additional reflex which I had to master later.

During the course of 25 years of teaching c.w. to teenagers, I have found that the average teenager cannot write legibly beyond 25 w.p.m.

You can perform a test on yourself by writing out the words of a familiar poem or passage at maximum speed for one minute. Divide the number of characters written by five to get your writing speed. Teenagers range from 17 to 30 w.p.m.

Beyond approximately 25 w.p.m. therefore, one must resort to the use of the typewriter. Code-speed contestants have been known to copy up to 45 w.p.m. by hand, and many hams qualify for the 35 w.p.m. code proficiency certificate by hand, but they are unusual individuals.

Building up a Vocabulary

Up to about 25 w.p.m., one can afford to follow each letter as sent. Beyond that speed one must learn to build up a vocabulary. A vocabulary consists of a combination of letters. Some common ones are: ed, ff, th, de, be, an, oo.

To progress to higher speeds, one must increase the scope and length of these bits. This classification may include such combinations as ing, aff, ent, the, and int.

At higher speeds, you begin to recognize whole words, simple words perhaps, but these words enable you to catch up on your typing. Numbers and punctuations are usually recognized by the fact that they are longer bits than the standard character, and are recognized only after a slight pause. At high speeds, the key is to recognize the pauses between words. This split-second pause gives you the time to get set for the next burst.

Many stories are told of the skilled operator who listens to high-speed code, goes next door, gets a drink of water, and then calmly sits down to type out what was sent. Such stories frequently are colored by the fact that the witness is not a high-speed code man and is dazzled by the burst of speed which to him means nothing. The high-speed operator is able to read this burst, and to retain it up to a limit. I defy you, however, to remember a ten-digit telephone number heard only once and then to transcribe it after a period of delay. There is a ceiling to the retention capability of the human mind. (In fact, this is brought out in a well-known test administered to executives.)

If what is sent on c.w. is a simple sentence or most likely a routine order or command, it doesn't take much to impress the witness. At high speeds, the gap between typing speeds and code speed becomes smaller and smaller.

Copying Behind

I remember vividly the merits of copying behind. As a youngster, I took the ham exam from a Navy operator (no FCC office). He started to send "of" then tacked on an "f." I immediately thought of "off" and got set for the next word. But to my dismay, without a pause he sent an "i" and immediately I tried to outfox him by prewriting the word "office." To my consternation he kept on going with "cia" and I quickly revised my thinking to "official." But I was still wrong because he finally ended up with the word "officially."

The question then arises as to how far behind one should copy. I find it too much of a mental strain to get too far behind and so have decided that a word or two is a leisurely pace. There is no point in getting too far behind because occasionally an unusual word will throw you off and you will quickly get derailed. This is especially so with foreign proper names and places. Press Wireless, recognizing this, frequently made it a point to leave pauses between letters for unusual names and words.

Necessity for Solid Signals

For amateur work where accuracy is not of prime importance, we can get by with a lot of missing words and letters and still make intelligible copy. DXers are noted for this, and phone men know how well one can double on a transmission and neither one would be too far off track on the next transmission. However, in code competitions for precise copy, a strong signal must be present at all times.

Consider the Connecticut Wireless Association's High Speed Code Tests up to 60 w.p.m. Assuming five characters to a word, this means that an average letter must be sent during an interval of one-fifth second.

During this split second, the brain must recognize the character and send the proper impulse to the typing finger. Any burst of static or fading takes out gobs of information. It is futile to try to make perfect copy from a long distance on a bad signal.

Are You Temperamentally Suited?

There is no question that high-speed code calls for quick reflexes (notice I did not say quick mind), for high-speed code copying is partially dependent on reflex and partially on conscious effort.

You probably have an aptitude for high-speed code if you find yourself making a quick reflex grab for an object which has slipped out of your hand, able to dodge successfully a falling object, or regain your balance when you slip on a banana. The writer absolves himself of the consequences of the latter test. QST