



comments

Hellschreiber

Dear HR:

The December issue of *ham radio* describes the Hellschreiber typing keyboard machine, and the article mentioned that the shortest pulses are 8.16 ms, producing a speed of 122.5 baud and a minimum bandwidth of 61 Hz.

Unfortunately for the system, the abrupt rise and fall times involved are quite broad. A similar system that has been on 14140 kHz from the Hsinhua News Agency in Peking for years (but now possibly removed at the request of the Intruder Match), is more like 3 or 4 kHz wide at a distance 6241 miles; it was hard to live with. There continue to be other signals here in the mornings on 3577, 3595, and 3845 kHz just before the 80-meter band closes to China.

The system I heard during WW2 was used by German fighter aircraft in interception, and directed from ground by this equipment. That was not so bad because vhf was used, and at some distance in frequency from other communications circuits. I think that it is a mistake to encourage the use of this system of 14 emission, which is *not* authorized by FCC Regulations, Section 97.61, except on frequencies of 51.1 MHz and higher.

My tape of the Hsinhua transmissions was printed by G5XB, who

thought that it was difficult for Chinese to read, and shows what would be expected when there may be as many as thirty or so strokes in one character. Obviously, that requires rather good facsimile definition or it might not be possible to read.

E. H. Conklin, K6KA
La Canada, California

Dear HR:

The December issue of your magazine arrived this morning and as usual I sat down to skim it — saving the serious stuff for later.

I was surprised at the Hellschreiber article. You see, I have one of these machines, sitting above the rafters of the shack, waiting until someone came up with the other one.

That last remark is deliberate: It relates to the time of WWII when I was working with the Signal Service Section of the Signal Corps in Liege, Belgium. We were located in rear of the 15th Army; they were sending back captured German equipment to our depot, and we had no orders how to process it. We were very busy reworking our own equipment. I was acting as senior officer in charge of salvage and incoming equipment.

Among the items coming in on the rail cars was this type of equipment. I intercepted three of these Hellschreibers and shipped two home complete and one in parts less the case. Luckily, the case size just fit the maximum package size that could be shipped home. I was also depot security officer, and as such knew what could be shipped and what couldn't. Numerous articles were shipped at my personal expense to the Signal Corps Laboratories at Fort Monmouth, where I had spent several weeks in 1942.

Thanks to the poor work of the Army mail, and over-emphasis on what could, and could not, be received within a country still at war, only one of the Hellschreibers arrived at my father's home address. The other and the parts were not re-

ceived, but I did receive some papers telling me that it was illegal to ship this stuff (our orders stated that souvenirs could be shipped only if certain papers were put on the outside of the package).

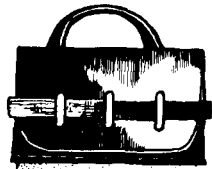
To say I was disgusted and angry is to put it mildly, but having only one Hellschreiber and no spare parts, I simply put it away until I could find use for it. I arrived home in December, 1945, and with a new wife and setting up a home and finding work, it was forgotten for many months.

Therefore, there is at least another of these machines in the United States. It will be marked inside with my call W6DKZ. The parts were not identified, as I thought no one would be interested in them. I am still looking for the missing machine, and would like to get in contact with anyone who might be saving it, as I intended it for a museum. If it turns up, I'll try out the two between some friends here in Santa Clara Valley.

The Hellschreiber machines are all that the writer says they are, although I did not know they would work well through QRM. They were made to work on wire lines as simplex or duplex, with isolating coils, and since they employ a tone and amplifier, they don't interfere with speech on the lines.

Henry B. Plant, W6DKZ
San Jose, California

Apparently the German Wehrmacht was not alone in their use of the Hellschreiber system during World War II. Ed King, WA8PFB, of Louisburg, West Virginia, reports that he has a U.S. Signal Corps BC-918B which has a similar ink pad and worm gear mechanism for "writing" on paper tape, but a photo-cell is used for the input. Ed's BC-918B has a 20-pin plug so it's part of a larger system, but Ed has been unable to locate the matching unit, or even to find a technical manual. Does anyone have any more technical details on this equipment or any ideas how it was used, or know where there might be a technical manual? **W1HR**



comments

microphones

Dear HR:

Readers should be cautioned to avoid using the type of audio cables suggested by W1OLP in his article on microphones and speech processing in the March issue of *ham radio*. Only the audio line should be inside the shield. Having the audio line plus the PTT line and/or battery line inside the shield will, in many cases, result in unwanted noises in the transmitted audio: hum, switching noises, and stray rf. It is preferable to use microphone cable which has one shielded line for audio, with the PTT and other control lines outside the shield.

Buddy Massa, W5VSR
New Orleans, Louisiana

Hallicrafters story

Dear HR:

The fine story by W6SAI about Bill Halligan's HT-4 (BC-610) in the November, 1979, issue of *ham radio* surely brought back a flood of memories — Utah Beach, Ste. Mere Eglise, Carentan, Isigny.

We had five mobile units in ADSEC (Advanced Section Communications Zone), 3rd Army, and only one of them was an SCR-299, the others were SCR-399s. I would like to call your attention to the incorrect caption with the photograph on page 24. The mobile unit is an SCR-299, not 399; the 399 differed mainly from the 299 in that it was not housed in a panel truck; it was provided with an

HO-17 plywood shelter, designed to fit the equally famous 6x6 International truck. The shelter could be lifted off, complete with its equipment, and operated on the ground as a fixed station.

Our first team's unit was installed in a "Duck" amphibious version of the 6x6, with two little PE-75 gas generators connected in parallel on the aft deck. They were let down from the LST *before* H-hour on D-day and made an attempt to scramble ashore, but they were met by severe mortar fire and forced to withdraw. Later they gained an exposed position on the beach and made contact with our station in England that had been set up in late May.

I was the Platoon Sergeant of the fifth team and some days later we had all units dispersed several miles apart and well camouflaged in the Normandy apple orchards. They were tied with field wire keying lines (duplexed for telephone) to a radio center in the loft of an old French barn. In the stable below were the TC-10 telephone boards and the Message Center. All operation was manual and long press dispatches were cleared between items of military traffic. Later three more SCR-399s arrived and eight were operated for a few days. Then one-by-one the ADSEC units began to leave to follow the action. Some months later one was in Namur, Belgium, in contact with besieged Bastogne.

I should add that the operators who accompanied these units were highly specialized, having worked in the signal center at the Pentagon before leaving the States. Likewise, many of the technicians were specially trained on SSB multi-channel (AFSK) high-power transmitters (40 kW). They formed the nucleus of the Paris communications center in the "Block House" about a block from the Arc de Triomphe de L'Etoile on

Rue Wagram. Some followed the action; some had very important missions elsewhere.

We experienced only one real trouble with our BC-610Es. The high-voltage in the modulation transformer would break down to ground, killing the rig. We found that we could set the transformer up on four short standoff insulators supplied in the spares chest and be back on the air in half an hour. Information was sent up through channels on this fix and apparently others had experienced a similar failure because a Field Change Bulletin was put out by the Signal Corps directing that this modification be installed in all BC-610Es.

After VE-day, returning to France and to the Signal Depot at Mohn near Meziers, SCR-399s were stashed in the fields around the buildings as if we were operating a trailer park. I wonder now what happened to all of them. Some were trans-shipped to the Pacific Theater, but most were left behind.

Clifford O. Field, WA2JVD
Fair Haven, New York

more Hellschreiber

Dear HR:

E.H. Conklin, K6KA, is not quite right in describing the Hellschreiber as a wideband system (Comment, March, 1980). Admittedly, the bandwidth of any keyed system is a function of the keyed element rise time, but with proper pulse shaping as practiced by the majority of the PAØ and German Amateurs the amount of spectrum space occupied by a Hellschreiber signal is only marginally greater than that of 45.5-baud RTTY.

The bandwidth necessary for Hellschreiber may be quite easily computed by reference to CCIR Recommendations, which in Appendix 5 of Radio Regulations state that this is

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the product of baud speed times K , K being a factor depending on the "goodness" of a circuit. The baud speed of Amateur Hellschreiber is 122.5 which multiplied by a K factor of 3 gives a bandwidth of 367.5 Hz. The K factor of 3 comes into the picture because it has long been recognized that a square wave and its third harmonic is perfectly acceptable for normal communications. The bandwidth of a 45.5-baud, 170-Hz shift RTTY computed according to CCIR is 245 Hz.

K6KA is correct in his criticism of the Chinese Hell-Fax signal, lately on 14140 and believed still to be working in the Region 2, 80-meter band. But this is a different system with a baud speed of somewhere in the region of 400, and observedly with little or no attempt at pulse shaping; some channels are even FSK with 800 Hz shift! They are certainly wide band and not to be compared with the Amateur 'hell' in Europe.

Finally, I hold no brief for the Hellschreiber system as such but, as I worked with the system throughout most of its active life and am fully conversant with its advantages and shortcomings, I thought I'd like to put the matter straight.

Stanley A.G. Cook, G5XB
Radio Society of Great Britain
Reading RG4 9BP, England

PCB "threat"

Dear HR:

I noted in "Presstop" in May, 1980, issue your warning regarding the "potentially deadly threat" existing in the form of PCBs or polychlorinated biphenyls, and should like to thank you for bringing the attention of the fraternity to this material.

However, I should like to point out that the PCB hazard has been, like many others, vastly overrated by media exposure. PCB in massive doses fed to lab test animals has been

shown to produce malignant tumors, and repeated applications to the skin of mice has indicated some potential as a dermal carcinogen.

PCB came to the attention of health authorities through two major instances. One was in Japan, where, by error, it was substituted for fish oil in food packaging. The second instance occurred in the U.S., where, in error, it was added in place of vegetable oil, to cattle feed. In both cases severe illness resulted from the consumption of the PCB-contaminated food.

Occasional handling of PCB has shown no deleterious effects on humans. In fact, many Amateurs who are also Industrial Electricians will testify that they have had their hands in it innumerable times, and in big transformer work have literally been immersed in it, with no visible short- or long-term effects.

The properties of PCB, which make it such an excellent electrical insulating fluid, are the qualities that cause the physical and ecological problems. It is heavier than water, non-conductive, and will not break down or decompose at temperatures under 2000°F. In fact it requires the full 3500°F heat of a cement kiln to break it down. Under normal conditions, it is not bio-degradable. This is its biggest hazard. Once spilled, it remains in the ground indefinitely, being propagated by natural ground waters, absorbed unchanged by plants, which are then eaten by animals.

Incidentally, if you have a tube-type television set or refrigerator more than ten years old, fluorescent lights, or a car with brake fluid or hydraulic fluid more than ten years old, you probably have another source of PCB.

Amateurs, building or buying dummy loads without transformer oil, and having gone to their local utility for a gallon of "good, hi-temperature transformer oil" have received a gallon of PCB. All the above is presented to show that PCBs have been around and done a good job for years, and

pose no "potentially deadly threat" in the quantities hams use.

PCBs can be differentiated from mineral or vegetable transformer oils by the following means:

1. The smell of PCBs is somewhat similar to that of moth balls. Ordinary vegetable or mineral transformer oils smell like oil.
2. Pure PCB is heavier than water, and a drop dropped into a bottle of water will sink. Ordinary transformer oil will float on water.

If you have a PCB-filled dummy load that has a leak or a filter capacitor filled with PCBs that shows a leak around the bushings these leaks can be easily repaired using "Weldfast 220" or equivalent epoxy. First clean off all PCB seepage with a good solvent; "Xylene" will do fine. Wear rubber gloves to protect you from both the Xylene and the PCBs, and store contaminated wipers in a sealable can. Mix the epoxy, smear over and around the leak, and let it set. Job done.

Clean up any spilled PCBs well with Xylene and rags. Store rags, rubber gloves, and all contaminated materials in a sealed can. The whole object of the game is to keep the PCB from getting directly into your food and from getting into the food chain via the earth and ground water. A call to your public utility will provide a safe method of disposing of your PCB wastes.

Above all, remember PCBs are a hazardous substance, not a "deadly threat." Inspect your capacitors and ensure they are not leaking PCBs. If they are, repair the leaks and clean up the spills properly, or remove the bad component and clean up the spill properly. Put all contaminated materials in a sealed can, wash your hands well, call your public utility and make the necessary disposal arrangements. Don't panic and throw them in the garbage. If you do, you can be sure of getting your share of them back through the food chain.

Tom Ruynon, VE5UK
Saskatoon, Saskatchewan