Telegraph Time Machine
By Greg Raven

"The great network of telegraph wires that once enfolded the nation like a cobweb has vanished just as surely as the spider's handiwork is erased by a sudden sweep of the broom."

from "**The Telegraph**" by Lewis Coe

The great telegraph wire broom may have gotten all of the old open wire lines, but American Morse is still being used as a means of communication. This is a report on "dial-up" telegraphy, the last remaining vestige of landline Morse telegraphy in the US.

The Morse Telegraph Club is a group of enthusiasts interested in any topic concerned with Morse code and telegraphy. Probably the biggest constituency in the club is retired landline Morse operators. Each year, the various chapters around the country meet on Professor Morse's birthday to remember the good old days of landline telegraphy and the heyday of the railroads. In addition, keys and sounders are dusted off and telegraph circuits are established with other chapters around the country. Morse code is soon heard clicking from sounders and greetings are received from friends in other chapters.

How is this accomplished ? The MTC members use an interesting combina tion of modern and 150 year old technology which is called "dial-up" telegraphy. This article describes how dial-up telegraphy works, and how the interested Morse enthusiast may participate.

How Does Dial-up Telegraphy Work ?

Dial-up telegraphy uses technology salvaged from the wave of inexpensive personal computer equipment that became available in the 1980s. The "modem" which is essentially a transceiver designed to transmit digitally encoded data over voice phone lines is easily adapted to transmit the dits and dahs of Morse code. Most modems using the Bell 103 standard can be used. Since the 300 baud Bell 103 standard is obsolete by todays standards, these modems can be found at fleamarkets and hamfests and can usually be had for a few dollars. A favorite is the Radio Shack DCM series which is very easy to work with.

The Bell 103 standard is a full-duplex system. Each modem can transmit 2 different tones; one tone represents a mark while another tone represents a space. The modem can operate in two modes; answer and originate. The "answer" or "originate" simply indicates which tone is used for mark (key closed), and which tone is used for space (key open). When 2 modems are linked, one is in answer mode and the other is in originate mode.

Dial-up Morse differs very little from an actual method used to provide Morse service during its last years of commercial service. The Bell 103 signalling standard allowed equivalent DC loop circuits to be used where true direct current signalling had been eliminated. Today the only significant difference is the fact that you must must use a phone to dial the number of the other office as opposed to having a permanently connected and dedicated line.

A simple circuit is required to provide the interface between the modem and the telegraph key and sounder. By far the most popular circuit is the "Trump" circuit, named after MTC member Ed Trump. At one time

printed circuit boards were available to simplify construction of this circuit. However, the circuit is relatively simple and can be built on perfboard if you have experience with this type of circuit construction. See the appendix for more information.

Using the Dial-up Morse Terminals

Two telegraphers would use the dial-up equipment as follows. By standard convention, the telegrapher originating the call will switch his modem to originate mode. The telegrapher receiving the call will switch his modem to answer mode. The originating telegraph op dials the number of the answering op. As soon as the phone begins to ring, he turns on his modem and hangs up his handset. When the answering op picks up his handset, he will hear the tone from the modem. The answering op then turns on his modem, and hangs up the handset. The two sets now behave exactly like a direct current telegraph loop. Either operator can break the circuit by opening his circuit closer, and two-way Morse communication can begin.

The Hub

The above example of two offices in direct connection is the simplest possible dial-up circuit. More complex circuits had several "offices" cut in to the circuit. Several operators would monitor the same wire and would respond as necessary to indicate they had copied a message or were preparing to send one. A "hub" allows up to 6 offices to be cut in to the same circuit. The fact that any telegraph hubs exist is amazing. In the case of Ace Holman's (Silent Key) "KB" hub, 6 telephone lines enter the hub and are totally dedicated to the hub facility. Ace Holman's Hub has been moved to "The Michigan State Trust for Railway Preservation, Inc." in Owosso, MI.

Each Saturday the hub comes alive at about 4 pm ET. It is absolutely astounding to dial in, get a solid carrier from the hub, and watch the sounder come alive. Offices from around the US and Canada cut in to the circuit, and a high-speed Morse roundtable ensues. Each office has a two letter call, which is used to keep things from getting too confused. The distinctiveness of each operator is apparent. Operating protocol is simple and efficient, in contrast to the typical style of amateur CW operation. The hub and dial-up telegraphy are true time machines which allow the art of Morse telegraphy to be brought back to life.

Additionally, on Wednesday evenings at 9 pm ET, the hub comes alive with the Slow-Speed Morse Wire Net for those wishing to brush up on their code speed, and also help is there for those just learning the American Morse code. The Slow-Speed Morse Wire Net is also on the hub on Saturdays at 1 pm ET.

The hub is now the focal point of Morse operation during the Morse Day meetings. Using dial-up, Morse meetings can take place anywhere a phone line is available. Some predicted the demise of Morse Day without the Western Union wire, but now it is better than ever! The hub can also be used for special events such as Morse demonstrations at railfan meets.

The Slow Speed Morse Wire Net on Hub

I collect landline Morse instruments and books on the subject. Being interested in landline Morse, I was fascinated by the possibility of actually using the instruments in my collection to communicate via dial-up telegraphy.

I ordered a PC board for a "Trump Circuit" and soon had it assembled. A local Radio Shack provided the DCM-6 modem. A Bunnell sounder and J-38 key completed the dial-up set. All was ready. First a test using the time signal from Ace Holman's hub. At exactly 3 minutes before noon, the sounder began ticking just like a clock! Well, it worked. Cutting in to the session at 4 o'clock was very interesting. The roundtable was there all right, just like it said in Dots and Dashes, but the operators were sending so fast the sounder just about jumped off the table!

This was somewhat discouraging, as it was impossible to copy even a single word. Unlike learning international code, there is no "novice" amateur band where one can begin communicating at slow speed. Determined to learn Morse, I contacted Ace Holman to discuss the creation of a slow-speed Morse learner's session, which would meet each Saturday, using a roundtable format similar to the 4 pm session. I determined that 2 pm ET would be a good starting time. An announcement of the session was published in Dots and Dashes.

The Slow-Speed Morse Wire Net is a one-hour long window starting Saturdays at 2 pm ET. The purpose of this session is to allow Morse enthusiasts to learn and experience landline Morse operation via dial-up telegraphy. All you need to participate is a dial-up set, a telephone, and some motivation to learn Morse and some simple operating procedures. You are welcome to dial in and just monitor, but please feel free to break in and participate.

Conclusion

This article was written to introduce the key collector and Morse hobbyist to dial-up Morse with the intent of increasing participation in the Slow-Speed Morse Wire Net. If you are motivated to learn a new code, you will find that landline operation is very entertaining and enjoyable. The opportunity to understand how Morse was learned and used is tremendous. Experience history-- try dial-up Morse!

Appendix

Learning Morse

Never use the phrase "International Morse" in the presence of a landline telegrapher. To him, the only code to be called Morse is the original variety concocted by Morse and Vail sometime in the early 1840s. The other code, the code used on foreign landlines and radio, is to be called "Continental or International Code". It is not Morse.

I have found that the best way to begin learning Morse is by computer. An outstanding program called "The Mill" has been written by Jim Farrior. This program is capable of sending both codes. Included with the program is an excellent "book" on how to learn the code. This "book" is actually a series of files on the disk, which can be used as code practice files.

A simple circuit allows the serial bus port of an IBM compatible computer to drive a sounder. This is really the way to go, and besides a sounder makes a really neat computer peripheral. The circuit diagram is included with the program.

Jim's program will send text files that reside in the same directory as the program. A utility is provided to write your own practice files, or you can use any editor and them place them in the Morse directory. "The Mill" is available from Jim Farrior for $15 postpaid. Special MTC member price $10. $5 for upgrade. Be sure to state floppy drive size.

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1332 Harrison Point Trail
Fernandina Beach FL 32034

Morse Telegraph Club Membership Information

MTC dues are $10 per calendar year in the US and Canada, $14 (US funds) elsewhere, and entitle members to all issues of "Dots and Dashes" for the year. US members may upgrade to 1st class delivery of Dots and Dashes by paying $14. Dues must be sent to a local chapter Secretary-Treasurer. For application instructions write to

Keith LeBaron
Secretary-Treasurer
550 North Greenfield Drive
Freeport IL 61032-4594

Obtaining DCM-6 Modems

Bell 103 modems with manually selectable answer/originate are best for dial- up telegraphy. A favorite is the Tandy DCM (Direct Connect Modem) series that was offered by Radio Shack until about 1991. It may be possible to find these modems at hamfest flea markets. Look for someone selling a Tandy computer system; you may be able to talk the owner into the selling the modem as a seperate item. I found a DCM-3 recently for $2 at a fleamarket.

Schematics for Dial-up Interface

There are schematic diagrams and block diagrams available at the Information Booth, items 15 through 19.

Telegraph Hub Information

Ace Holman's Morse telegraph hub "KB," located Owosso is fully automatic and can be used on a 24 hour basis. Six legs are available. When you dial 989-729-9800, the first idle line will pick up the call and return answer tone toward your modem. Your marking originate tone must be detected within a 15-to-20 second interval or the call will be dropped. If others are present on the hub, you will hear them immediately and can break in as you see fit.

This article was originally written by Greg Raven. Owing to the passing of our friend Ace Holman, his children were in agreement with Ace's wishes and donated the "KB" hub to the Morse Telegraph Club, Inc.(MTC). Jim Wades, a director of the MTC, and an EE with CSX, oversaw the entire operation of moving the KB hub to Michigan and putting it back into operation..

Keith LeBaron has edited this page to reflect the changes that have occurred in the past year regarding the KB hub. Any reference to Ed Trump's hub has been deleted because it no longer exists. - *6 December 2004*