CQ Reviews:

The Hal Communications Dual Mode Keyboard, Video RTTY Display and RTTY Demodulator

BY HARRY B. ROBINSON,* W2SR

For one whose communications experience dates from the brass telegraph key and sounder, today's technology in this field is almost overwhelming. Consider the fact—some of today's communication circuits operate at a 9600 baud rate—ten channels of 1000 w.p.m each simultaneously over one voice-grade telephone line. That's a far cry from the single copper wire, battery-to-ground type of circuitry used in the Morse days...

One of the spinoffs of such advanced techniques is the wealth of new, sophisticated accessories now available for the advanced amateur radio station. Foremost among these, for the RTTY and c.w. enthusiast, is the product line from Hal Communications Corp. First, let's take a look at the Hal Communications model DKB-2010 dual-mode keyboard, dual-mode because it generates both c.w. and RTTY signals. Housed in an attractive grey case, the keyboard layout is similar to a computer terminal keyboard. There are 52 keys arranged in four rows. In addition to the usual alpha/numeric keys there are, in the c.w. mode, eleven punctuation marks and five double character combination keys—AR, SK, AS, KN, and BT. Also included is an error key, which generates a string of dots to indicate a mispunch. There are three special function keys which are programmed by separate diode matrices. Although usually programmed at the factory for "De-call letters," "CQ" and "DX" the matrices can be changed if one so desires. A space bar is included and actually generates a word space. A three-character buffer register is standard and allows smooth typing without regard to the length of the c.w. characters—as opposed to the non-rhythmic typing necessary in some keyboards without the buffer feature. A "buffer full" lamp lights up when your typing speed exceeds the output by more than three characters.

Output speed is controllable from 8 to more than 60 w.p.m. by a panel mounted pot. Keying weight is adjustable to fit your particular transmitter circuitry and provision is made for either grid-block or cathode keying via jacks on the rear panel. A sidetone oscillator and built-in speaker allow you to monitor your signals. Tone and volume are adjustable.

In the RTTY mode, the DKB2010 is a most versatile instrument. Four crystal-controlled keying speeds are provided—60, 66, 75 and 100 w.p.m. An "end-of-line" lamp will light up when you have reached the 65th character of a line.

There are 17 punctuation marks, three carriage control keys, two shift keys, a break key and the three special keys for "CQ," "DX," and "DE." Also included is a "QBF" key which, with one stroke, transmits the test line "The quick brown fox jumps . . . etc. . . ." The shift keys are used for punctuation. There is no need to shift for numerals as the keyboard generates a figures shift automatically when a numbered key is struck. A separate output jack on the rear panel is provided for RTTY keying of the usual 130v 60 ma loop supply.

An available option is a 64 or 128 character buffer-memory board. The addition of either of these plug-in options immensely increases the flexibility of the machine. In this mode, the shift key, in addition to shifting for punctuation also provides control for the buffer-memory. The shift keys act similarly to the CONTROL key on computer terminals. Holding the shift key down while depressing the "DE" key clears the buffer-memory and when struck in combination with the "DX" key inhibits the output from the buffer-memory and allows one to type into memory without keying the transmitter. You can enter the beginning of your reply to a station while he is still transmitting to you. When you get a go-ahead from the other station simply depress the shift key with the "CQ" key and the machine will start outputting from the memory section. For break-in operation while in the c.w. mode just inhibit the buffer-memory output as stated above and use the "BRK" key as a hand key for a fast comeback and then resume automatic operation by depressing the "shift/CQ" keys without losing anything already in the buffer.

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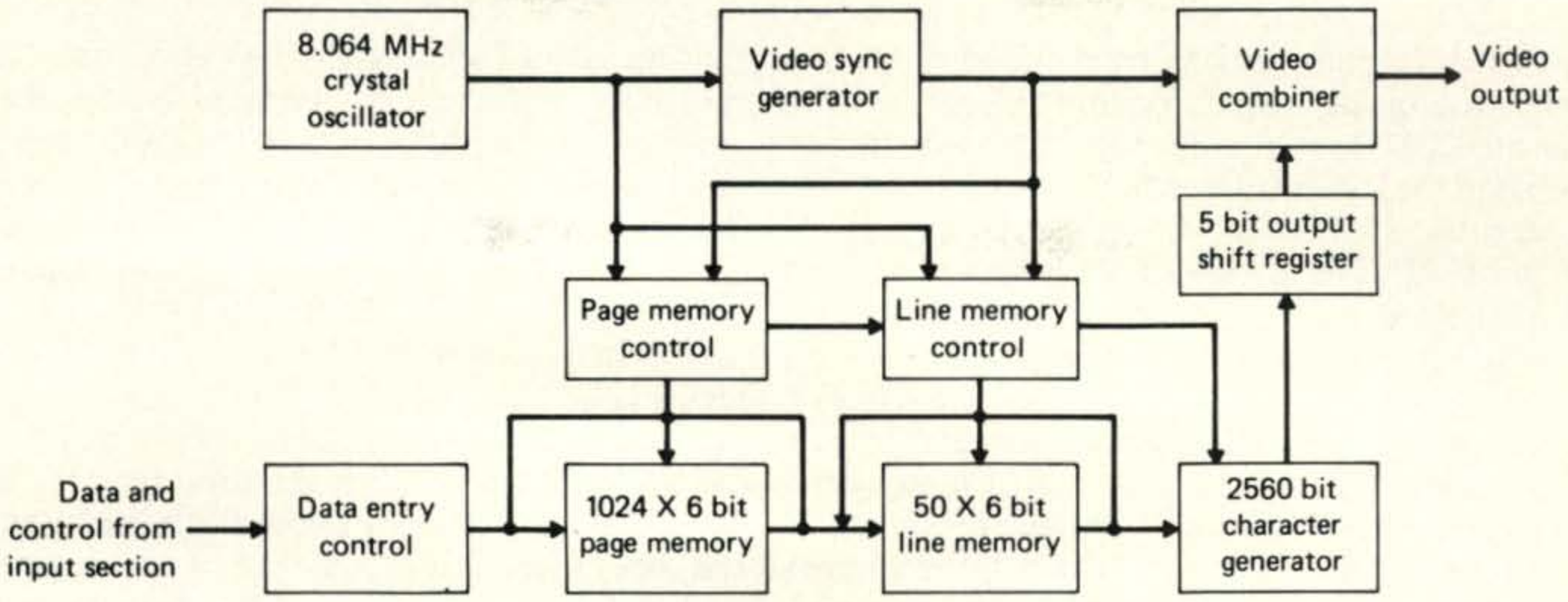


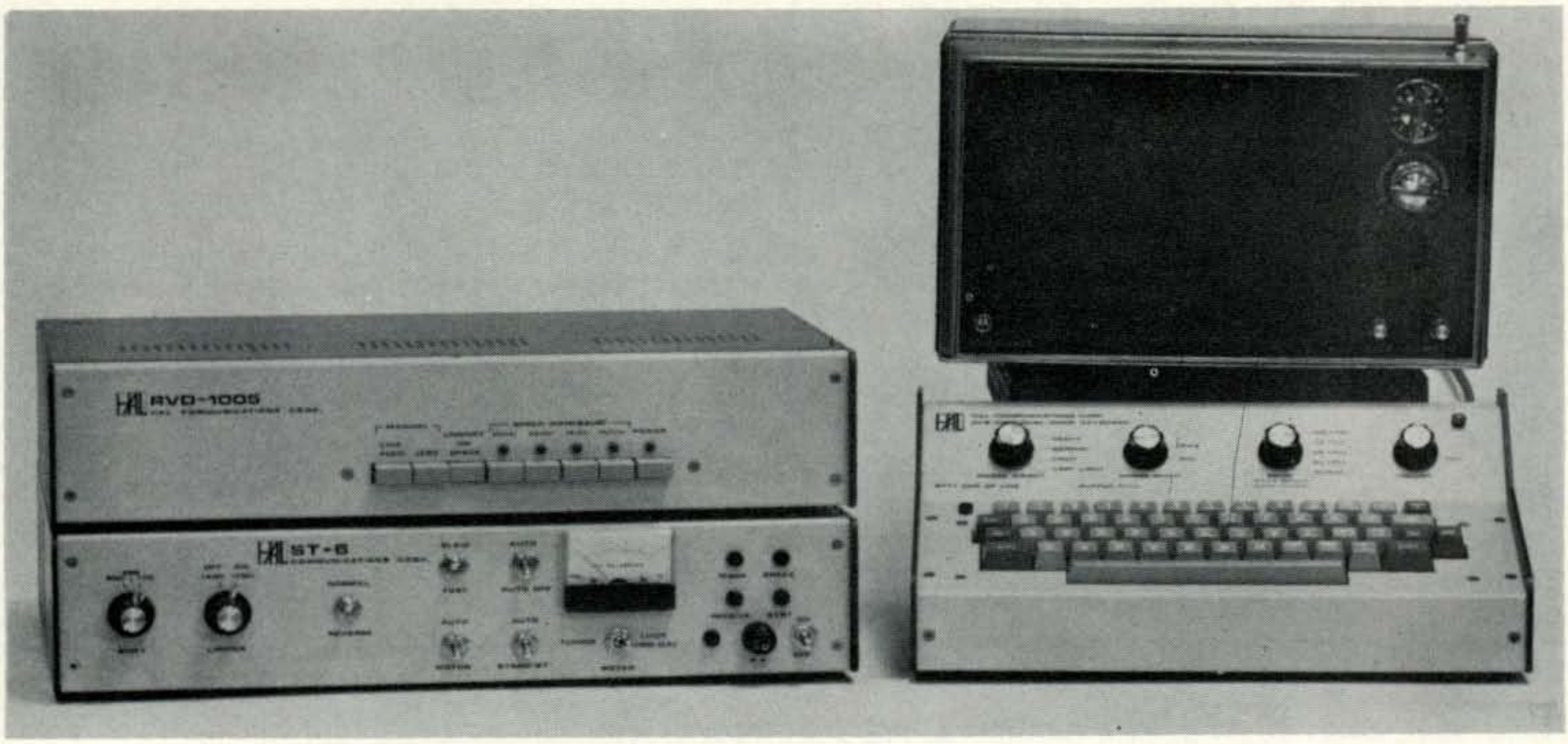
Fig. 1—Memory and display section block diagram RVD-1005 display generator.

Any RTTY enthusiast, even the hunt-and-peck beginner, will have no trouble getting used to the operation of the keyboard. With just a little practice you can become a real expert. The key touch is soft but positive and much less fatiguing than pounding a printer keyboard or even a perforator. The c.w. types may find it a bit confusing listening to both the keyboard monitor and the regular station monitor at the same time, as the keyboard lags behind the transmitter output by the number of characters you have managed to pile up in the buffer-memory. Just turn off the keyboard monitor and have confidence in your typing accuracy. Or if you're a little "Chicken" listen only to the keyboard monitor so you can correct your typos when noted. The expert typist, using the extended memory option, will be especially pleased with this machine. The input speed to the memory is limited only by your ability to type. Go as fast as you like and the output in either c.w. or RTTY mode will flow smoothly with perfect characters and spacing at whatever speed you have set the controls.

Mating this keyboard with the new Hal RVD1005 Video Display generator and a TV monitor produces a total system which most amateurs would have considered impossible only a few years ago. None of the usual printer problems with this system—no noise, no oil, no fussy adjustments, no messy tape or paper all over the floor and a minimum of space is necessary. All solid-state—with attendant low power consumption for the energy conscious amateur—this integrated system provides features not found in most electromechanical printer setups.

Simply stated, the RVD1005 take the output from any terminal unit and converts the baudot signal to one that is compatible with any TV set. Hal's instruction manual gives the complete "how to" information for such interfacing. A nine-inch video monitor complete with r.f. front end for regular TV reception is also available from Hal.

The front panel contains a number of push-button switches—one for power off, four speed selection switches, 60, 66, 75 and 100 w.p.m., an unshift-on-space switch and a manual line-feed and letters switch. Operators will have no



The Hal Communications RTTY demodulator (lower left), video display generator (upper left), dual mode keyboard, and Motorola TV set/diplay.

trouble determining which speed switch to push. There is a built-in "speed decision" circuit which lights an LED over the appropriate pushbutton to indicate the incoming speed.

Internally, the RVD1005 is much improved over the RVD1002 predecessor. Instead of four plug-in printed circuit boards there is now just one large circuit board without edge connectors and accompanying "dirty contact" problems. Connections to external switches, power, lamps, etc., is made with DIP plug-ins which mate with IC-type sockets for positive, protected contacts.

Input to the unit is from either a 60 ma loop supply or a ±15 volt FSK signal such as produced by the Hal ST6 terminal unit. This can be modified internally for either EIA or RS232-type keying.

The output is completely compatible with US television standards. The video signal bandwidth is a little less than 4 MHz. The Line rate is 15,750 kHz, the field rate is 60 Hz. and the frame rate is 30 Hz. There are 262.5 lines per field and two fields per frame with interlaced lines. The characters are displayed as white letters on a black background and are made up as a 5×7 dot matrix. There are 40 characters per line, and 25 lines to a page, displaying the same 1000 characters per screen as the previous unit but with somewhat larger sized letters. A cursor appears on the screen indicating where the next character will be formed. The characters appear continuously on the screen and are changed only by the reception of new information which is written letter by letter as it is received on the bottom line of the display. As each line reaches the 40th character, or more properly, the first space after the 35th character the unit generates an automatic carriage-return and linefeed and the cursor returns to the bottom left of the screen. Since the usual transmitted line of teleprinter copy contains 70 to 75 characters the screen display is broken into two lines of about 40 characters on one line and 30-35 on the next line. When the screen fills the top line is pushed off screen by the next line of information entered. There are always 25 lines of copy displayed. For contest operation there's just no way an ordinary teleprinter can compete with this system. It's fast, very readable and perfectly adapted for the usual short contest exchange. And in addition, the lack of noise and ease of operation leaves the operator much less fatigued after long hours of operating.

The ST6 terminal unit from Hal has been presented many times in various publications over the past few years and needs no review here. Suffice to say that it is one of the most versatile terminal units available today, with all the features one needs for today's modern RTTY amateur.

Combining the DKB2010 keyboard, the RVD-1005 and the ST6 into one integrated RTTY/c.w. station makes a neat, compact, attractive layout for today's advanced amateur and is a totally new, exciting experience for even the most blase ham. The DKB-2010 keyboard is priced at $425; 64 key buffer at $100; 128 key buffer at $150.

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MATH'S NOTES

BY IRWIN MATH,* WA2NDM

In September and October of last year we discussed FET's and some of their many uses. At that time we also briefly touched on their r.f. applications and, judging by the mail consequently received, did not give enough useful information and circuitry to satisfy our "home brew" v.h.f. receiver enthusiasts.

We will try to rectify the situation this month and next month by presenting our thoughts and a collection of typical front end circuitry for the two bands of most interest (according to our mail) six meters and two meters. In months to come we will actually be building and evaluating "state of the art" converters for each band for our own v.h.f. station along the lines of this discussion and will be glad to present these results to our readers.

We would also be most anxious to see some of the circuitry designed by our readers and will publish schematics as well as pictures of true high performance units.

For purposes of simplicity we will consider each band separately as the requirements for one frequency range are very different than those for the other. This month we will cover six, and next month two. Then we will conclude the series in March with mixers and local oscillator schemes.

Six meters has been called the one band that exhibits all forms of propagation and, in fact, everything from reliable, consistent local communication over a 50-100 mile path to world-wide DX has been worked on that band when conditions permitted. One problem with the band however, is the high noise level —caused to some degree by atmospheric conditions and to a greater degree by man-made interference such as very close (in frequency) 50 kw channel 2 TV transmitters, low band public service transmissions, etc. The basic requirements for a good front end for six meters then is good rejection of strong adjacent frequency signals, a noise figure that will allow

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Contest Calendar [*from page 70*]

of the multiplier from all bands.

In celebration of the 50th anniversary of the REF, contacts with the special station F8REF are worth 50 QSO points and 1 multiplier per band.

Awards: Certificates to the top scorers in each country and US call areas. Contest contacts may also be applied for the many French awards, DUF, DPF, DDFM and DTA.

Logs go to: REF Traffic Mgr., Lucien Aubry, F8TM, 53 rue Marceau, 91120 Palaiseau, France.

Editor's Notes

Mailing deadline for your c.w. logs comes up the 15th of this month, (Jan.) so be sure to get them off to us. When we eventually receive them is something else. As an example, we did not receive HS4AGN's WPX log until October, six months after it had been mailed from Thailand, long after we had gone to press with the results issue.

The all band score is 507,345 points, 1286 QSO's and a multiplier of 227 prefixes. The log will be accepted.

We had a good one for the Phone contest last October. Conditions were fair on the first day and fair to good on the second day, just as George Jacobs had predicted in his MAIL-A-PROP forecast. Activity was good from almost all areas, especially the Caribbean which was loaded with Contest Expeditions. Now if we could only get some of the natives interested in contest operation.

At this writing it's impossible to give a forecast for the 160 Contest at the end of this month, but with a lower sunspot count than at the same time last year when we had a good week-end, we should at least do equally well this year. Providing we don't run into a high static level week-end. In any event fellows, keep out of the "DX Window," let that DX sneak through.

Good luck, 73 for now, Frank, W1WY

Antennas [*from page 43*]

about 6 dB gain over a dipole, but the front-to-back ratio is approximately 6 dB, too.

'The theoretical radiation resistance is about 17 ohms, but I found out that using two parallel lengths of 50 ohm coax line (to give me a 25 ohm line) made no difference in operation at all compared to just a single length of line. The s.w.r. is quite high on the line, but it loads OK and works plenty of DX.

'I think it is important to use polypropylene rope since hemp rope seems to conduct when wet and messes up things electrically. I use no insulators at the ends of the elements, tying the wires to the wood spacers with the plastic fiber rope. No doubt a 4 element rotary on a 100 foot tower could do better, but for guys without several spare kilobucks, this is a dandy and simple way to squirt a few extra dB's to Europe, Japan, or wherever."

"A fine little beam," sighed Pendergast. "Didn't you use one something like this, years ago, at 3A2AF in Monaco?"

"That's correct," I replied. "It was written up in *CQ* in 1959, if my memory is correct. And it really worked well."

"Well, the definitive word on the vertical antenna has not yet been said," observed Pendergast.

"Perhaps so," I replied. "However, my friend Paul Lee, K6TS, has just completed a new handbook entitled *The Vertical Antenna Handbook*, published by *CQ*. Ole Paul has played around with verticals for years and he is considered an authority on the subject. I'm sure his new book has a lot of good information in it."

"Is he more of an authority than you are?," asked Pendergast slyly.

"No comment," I replied. "Pass me the cooking sherry."

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The RVD-1005 video display unit is $575, with the Motorola TV set/monitor $140 from Hal. The ST-6 terminal unit is $390 complete. All are manufactured and/or sold by Hal Communications Corp., Box 365, Urbana, Illinois 61801.

—W2SR

QRPp [*from page 47*]

New QRPp Net

Quite a few of you have inquired about the existence or possibility of a QRPp Net. Since none exists, let's go ahead and start one! After monitoring various bands, 80 meters appears to be the best bet. I've worked both coasts with about 3 watts to a dipole at 30 ft. on this band. We should be able to make a go of it with some degree of success. One weekly session will be held on Tuesday at 2200 EST (Wednesday, 0300 GMT). The frequency will be 3540 KHz ±3 KHz. First session will occur on January 15, 1975, and every week thereafter. I will function as an informal NCS. We'll take check-ins for the first ten minutes, with stations calling each other in order for the next fifteen minutes, and then ten more minutes of calling for check-ins.

It's end of the year time again, and time for publishing the annual QRPp DXCC and QRPp WAS standings. Drop me a card soon with your standings, and indicate power. We'll see how QRPp'rs have fared during the past year. I'm proud to note that I passed the 100 country mark in late October of 1974 and I'm heading for 200 now! Getting the QSL's is the next problem. Until next time, then, 73, and don't forget the AGCW-DL QRPp DX Contest January 11-12, 1975. 73, Ade, K8EEG/Ø