Product Review Column from *QST* Magazine

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AEA KT-2 Keyer/Trainer

Austin Omni 2-M Antenna

KLM 21.0-21.5-6A "Big Sticker"

Logbook

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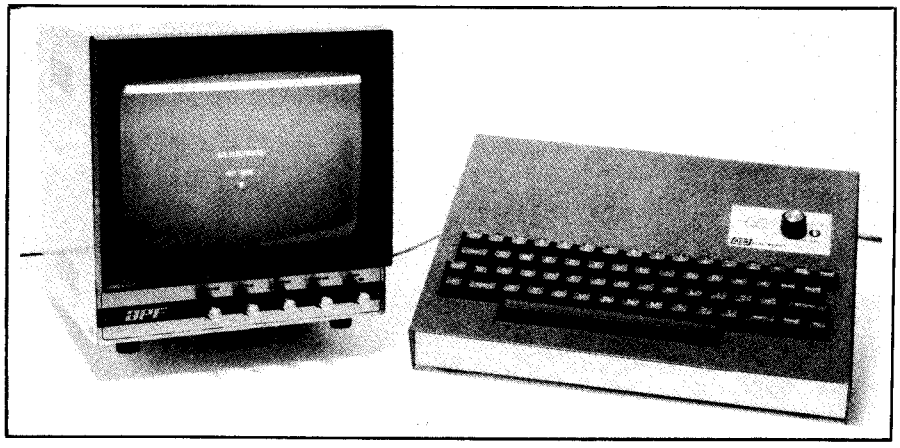
SRT 3000 Send/Receive Terminal

Product Review

Conducted By Paul K. Pagel,* N1FB

The SRT 3000 Send/Receive Terminal



A versatile, self-contained unit that transmits and receives Baudot, ASCII and Morse code, the SRT 3000 is lightweight, has a 63-key keyboard and a built-in modem (terminal unit). Just three connections to your transceiver and one to a video monitor, and you're on the air in style!

The '3000 gives no external evidence of its tremendous capabilities. To access different functions, various keys are pressed in conjunction with the CTRL or CTRL and SHIFT keys. There are no codings or guides on the keyboard as to which key controls which function (except for a few standard functions such as REPEAT, CQ, AS, DE, KN, SK and ID). It will take time to develop proficiency in handling this unit.

The SRT is best hooked up to a video monitor, (not included) although 5-V dc at 70 mA is provided for powering an rf modulator. Back-panel connections — all phono jacks except for the Morse keyed output, which is ¼-in. phone — include cassette control and audio lines, RS-232-C lines for computer and printer, oscilloscope vertical and horizontal connections for tuning purposes, sidetone output and the standard lines such as audio in, afsk out, video out, and a PTT line for transceiver control.[1] A built-in 0.5-W audio monitor and a small speaker enhance the independent status of this unit. An internal battery is used to retain some selective programmable memories when the power is turned off.

Innards

When the DGM and video monitor are turned on, the first thing you see is a status line displaying the information you need to know. Since the DGM contains a built-in modem, variables for different modes of operation are given. A tuning bar, which works like the "tuning eye" that was used on old receivors shows when the received signal is in optimal tuning range. During Morse reception, when the desired signal is correctly centered in the passband, a double asterisk (‡) will appear to the right of the tuning bar. The status line also shows the mode, speed, RTTY shift and T-R status, and a counter for the 1000-character buffer. More specialized functions are displayed at the right half of the status line. These include the 24-hour-clock readout and other functions, too many to be explained in this review. They are covered in the manual.

A series of selectable features makes versatile RTTY operation a reality: If for some reason you want to read the screen from across the room, you can select one of three different screen sizes. Page scrolling allows you to review a word or a sentence that has passed from view. A handy feature is the split-screen mode. It displays transmitted and received text on different halves of the video monitor, with reversed video to differentiate between the two.

One of the interesting aspects of the SRT is the ease of function selection. The instruction manual calls this "toggling." Word wrap-around, carriage return, unshift-on-space, normal or reverse video — all are keyboard switchable with just the simple press of the CTRL and/or SHIFT key(s) and the correct key, mnemonically coded (i.e., CTRL Q = QBF message; CTRL SHIFT T = time display, etc.). Other keyboard controls adjust the built-in TU variables: Shift settings, tone pairs and normal or reverse shift are all changed easily.

Using a programmable 8-character code, the SELCAL functions of the SRT are activated. This allows two stations to automatically send messages to and receive messages from each other. [Note: Under FCC regulations, control operators are still required to be present at both ends of the circuit.] The SELCAL functions include printer and tape-recorder control so you can have a copy of the message sent to you. If you have a message for the other operator, the "Who Are You" (WRU) function will, upon reception of the correct code, activate your transmitter, transmit whatever is stored in MEMORY ONE and turn on the SELCAL for any possible response.

Other Fine Points

- A 24-hour clock on the extreme right of the status line, and a time memory that sends not only the displayed time, but any other 36 characters of information you want (such as the date).
- Full-duplex operation, which makes use of the split-screen function to give you a truly interactive conversation, especially if you have a full-break-in transceiver.
- A break-in mode that allows you to transmit new information without disturbing what is already entered into the 1000-character buffer.
- A number of preprogrammed and programmable memories: Ten 80-character memories may be loaded. The capabilities of the SRT allow you to set up programming loops that cause one memory to include another, or to repeat by calling *itself* again (think of a flow chart).

A few "goodies" enhance Morse code operation with the SRT. Variable weighting and character spacing, an 800-Hz sidetone, and, for those of you with little to say during a QSO, an automatic idle that can be turned on to provide $\overline{BT}$ between characters.

Impressions

The SRT is certainly a versatile machine. The complexity of the controls necessitated a "crippled" approach to operation for a few weeks until I memorized the various command combinations. For the duration of learning time, DGM provides a handy one-half page (!) synopsis of operating commands that may be taped in a convenient place. I used the terminal at my home QTH, W1AW and N3KZ — it's lightweight and portable. The SRT can't generate large character symbols, but with quick manipulation of the memories and tape-recorder controls (also from the keyboard), I was able to insert fancy labels and brag tapes whenever and wherever I wanted. Tuning in signals with the status line bar is not difficult. The combination of a receiver RTTY filter helped when available, but even with a 2.7-kHz (ssb) passband I had little trouble copying signals. The internal demodulator filters did a good job of keeping things in the clear. When a scope was available, I made use of the crossed ellipse tuning method, but it really was not necessary.

The Morse functions are superlative. When venturing down to the low end of 40 cw, I was able to "make like the big boys" — those ops who coast at 50 wpm. By adjusting the weighting and intercharacter spacing control for high-speed intelligibility (and by preloading the text buffer to compensate for my 45-wpm maximum typing speed), I could keep up with the best of 'em.

With a maximum speed of 99 wpm, meteor-scatter work on vhf was made a bit easier by loading up a few memories with the correct information and then increasing the code speed for transmission in the proper sequence. The same function was used for moonbounce work, but with the message slowed to the appropriate rate for that mode. Even with 600 W of 432-MHz

[1]mm = in. × 25.4

*Assistant Technical Editor

rf five inches above the keyboard, no difficulties were encountered, and the SRT itself gave no RFI problems in any application — it's a well-shielded machine.

The manual is, for the most part, understood easily. Twenty-nine of its 35 pages are devoted to descriptions of the unit's capabilities. There's no explanation of the theory behind the SRT, but several pages consist of schematic and chip layout diagrams. A description of how to hook the SRT into a Microline 82A printer is also given. I never had problems with station equipment organization, for I could move the keyboard out of the way when it was not in use. The clean, sleek appearance and coloring (black, gray, silver) of the keyboard was much appreciated. When turning the unit on, I always made a few keystrokes to toggle and take advantage of those operating functions I like to use.

A Few Drawbacks

Despite its versatility and practicality, there are a few problems with the SRT-3000. The internal speaker faces out of the rear of the unit and gives a rather tinny sound. When used as a monitor for received signals, I found this limitation especially annoying, and feel there is no reason to use it as a substitute for your regular station speaker.

When switching into the split-screen mode, the monitor dims substantially, a result of the reverse video that sets off the transmit buffer display. The programmable clock must be reset every time the unit is turned on, a minor inconvenience. A feature included in many modern RTTY keyboards (but not the SRT) is an incremental QSO counter that would be perfect for contest operation.

When you are changing page-size formats, whatever is displayed gets erased. This is not a problem if you know what you want from the beginning of your operation. But if you decide to switch page sizes for any reason in the middle of a QSO, you'll lose whatever was there.

When you are selecting a speed for Morse code operation, the status indicator doesn't display the newly entered speed until you enter the transmit mode. This was a bit disconcerting at first.

The instruction manual organization is a bit strange, requiring one to read through the entire booklet before getting a truly composite idea of the SRT-3000 capabilities or even instructions as to how to turn the thing on. There is one typo in the digested command listing in the back of the book: The control commands used to turn on the random code generator for A-Z and for A-Z plus numbers and punctuation are reversed.

On the review unit, the detachable power cord unplugged a bit too easily from the rear of the keyboard, causing loss of the most recent commands and page memory. This happens, however, only when the unit is moved around. I quickly learned to hold onto the plug to keep it inserted properly when moving the keyboard.

The ac-line fuse is mounted internally, making access difficult; removing the cover is a bit of a chore. All in all, though, the advantages and pluses far outweigh these minor inconveniences.

The SRT-3000 is available from DGM Electronics, Inc., 787 Briar Ln., Beloit, WI 53511. Price class: $795. — *Leo D. Kluger, WB2TRN*

AEA KT-2

☐ After the thrill of making the first few 5-wpm cw QSOs, most Novices develop a growing urge to raise their code speeds to 13 wpm, 20 wpm and beyond. As any QRQ operator will tell you, the true joy of cw lies where syllables, words and phrases are recognized at higher speeds with little effort.

How do you get from QRS to QRQ? Practice. Advanced Electronic Applications KT-2 Keyer/Trainer can help you along the journey.

The KT-2 is a high-quality, key-pad-programmable keyer and Morse code trainer. An attractive 2-1/2 × 4-3/4 × 4-3/8-inch black and charcoal-gray metal case encloses a single glass-epoxy etched circuit board on which all components are mounted. On the top, forward-sloping surface is an on-off/volume control knob and a 12-button key pad. The back panel has two phono jacks for positive or negative transmitter-line keying, a 1/4-inch stereo phone jack for paddle connection, a 3.5-mm mini-phone jack for headphones and a power jack for connecting 12-V dc. The right side panel is perforated over the internal speaker, and the case sits atop four rubber feet to prevent marring desk tops.

Packaged with the KT-2 are a power cord, three-wire paddle cord and transmitter-keying patch cord, all with appropriate, high-quality plugs. An optional wall-mounted power supply, external rechargeable NiCd battery pack and an automobile cigarette-lighter cord for mobile operation are available at extra cost.

The Keyer

One of the KT-2's two modes of operation is as a straightforward electronic keyer with programmable sidetone frequency and speed, and other features. At turn-on, the sidetone is set at 833.3 Hz, though the frequency can be increased or decreased with two keystrokes. The code speed, initialized at 20 wpm, can be set precisely at speeds from 1 to 99 wpm. Regardless of dot or dash ratios (also programmable), speed calibration is exact. AEA uses the FCC standard of 50 code elements per word, using the word "PARIS" as the reference (a code element is equal to the time of one space between within-character dots or dashes). In other words, the word "PARIS" is comprised of 50 code elements, and the number of times it is sent per minute is the code speed in words per minute.

When using the KT-2 as a keyer, you have several mode options. At turn-on, the KT-2 functions as an iambic keyer: When using a two-lever paddle, holding the dot and dash paddles closed at the same time will cause alternating dots and dashes to be sent, a useful function when sending such characters as the letter C or a period.

Also, both dot and dash memories are enabled at turn-on; either one or both may be switched on or off from the key pad. Dot memory permits inserting a dot in a string of dashes by momentarily closing the dot paddle; conversely, dash memory permits inserting a dash in a string of dots.

For those who prefer semi-auto or "bug" operation, the KT-2 can be set up to form dots automatically, but generate a continuous tone for as long as the dash paddle is closed, mimicking a bug. Using this feature, you can also wire a straight key to the dash contact and use the Keyer/Trainer as a sidetone generator while keying a transmitter.

As mentioned earlier, dot and dash ratios (initialized at 1:1 and 3:1, respectively) can be programmed, each referenced to the length of an intra-character space. The dot-to-space ratio can be set from 0.5 to 1.5, and the dash-to-space ratio from 2.0 to 4.0.

The KT-2 will key just about any transmitter. Two diode-protected output jacks permit keying cathode-keyed and most transistor-keyed transmitters (+ jack) and grid-block-keyed and some other transistor-keyed transmitters (− jack).

Though certainly not a fault of the KT-2 in the literal sense, the jack wiring for the paddle connection is the reverse of that for some other common keyers. For the one-keyer user there is *no* problem; everything performs exactly as specified. The contester who uses the KT-2 and another keyer (one backing up the other) should note that several other commercial keyers have the dot and dash contacts wired the opposite way — to swap the paddle between keyers would require reversing the dot and dash wires. (See Hints and Kinks, *QST,* Jan. 1982, and "The CHIP (Cheap, Homemade Iambic Paddle)," *QST,* Oct. 1982, for ideas on how to solve this problem).

The Trainer

The KT-2 is a code trainer intended to be used by those who already know the code and who

want to increase their code speed. It is not intended to be a code teacher; you cannot drill on particular letters or subsets of Morse code characters. Once you are familiar with the code at a slow speed, the KT-2 offers an effective and intriguing method to improve speed quickly.

You set a comfortable starting speed, the desired ending speed and the length of time you want to spend on that session. Then, the KT-2 gradually increases the code speed from the starting speed to the ending speed over the programmed time limit. You can program any start/stop combination between 1 and 99 wpm as long as the speed is greater at the end than at the start. The duration can be programmed from 0.1 to 99.9 minutes. Alternatively, drill at a constant speed (no increase over time) is possible. At initialization, the starting speed is set at 5 wpm, ending speed at 20 wpm and duration at 10 minutes; this is simply the default condition and is easily changed from the key pad to suit a student's needs.

Within the trainer mode two code formats are possible. In the Farnsworth method, at the beginning of your programmed session characters are sent at the *ending* speed with inter-character spacing increased to yield the desired start speed. This is a proven method used at slow code speeds over W1AW and in ARRL code tapes. To increase the code speed over the duration of the session, the KT-2 gradually reduces the inter-character spacing. It is intended to prevent students from counting individual dots and dashes and to help them recognize entire characters as identifiable patterns, eliminating some of the plateaus that occasionally emerge.

Alternatively, you may select "slow code" method in which code is sent with the proper intra-character and inter-character spacings for the current speed. Again, you are cautioned that at speeds slower than 13 to 15 wpm, the slow code method is not recommended.

Code generation in the KT-2 is dubbed pseudo-random; it is not truly random in that the software reads characters from a 24,000-character table in ROM. Though finite in length, the table is large enough (!) that few, if any, users could commit it to memory. A student can select any one of 10 fixed starting points from the key pad or choose a random starting point. AEA will provide (for an additional $2) a written listing of the entire character table with the 10 starting points clearly marked; thus, you can check the accuracy of your copy. Though a few of the starting point character sequences became familiar (i.e., predictable) over time, after 30 seconds or so into any of the sequences the characters were again unpredictable; the random starting points were never identifiable.

Another choice offered by the KT-2 is fixed five-character groupings or random-length groups. With the fixed groupings you know each group will consist of only five characters; with the random-length groups, "word" length is unpredictable. You may also choose between common code characters (26 letters, 10 numerals, the period, comma, fraction bar and question mark) or both common and less common code characters (adding more esoteric punctuation and prosigns).

The only problem evident with the KT-2 (with some start/stop/duration combinations) is an inherent delay between "telling" the training to start and its actually starting. For example, though the delay is unnoticeable under the initialization conditions, when the values are changed to start equals 15 wpm, stop 25 wpm and duration 10 minutes, a 7.5-second delay ensues until the Trainer starts sending Morse. With the same start/stop speeds, a duration of 99.9 minutes (admittedly longer than most users would choose) causes a delay of 75 seconds. Other combinations yield a variety of delays. As the manufacturer explained:

> The condition ... is indeed endemic to the KT-2. The pause is actually "thinking" time for the microcomputer to determine how fast to start sending the code and what rate of acceleration to use. The amount of delay is dependent upon the parameters entered by the user ... The reason lies in the algorithm ...

The delay is little more than a slight irritant that will gladly be tolerated. Once the practice begins, the short delay is of no consequence.

One option that would make the KT-2 an even more effective trainer were it to be incorporated would be *decreasing* code-speed practice. Each approach, increasing and decreasing code speed, has its advantages and disadvantages. An increasing-speed algorithm (as used in the KT-2) starts you at a level where you're comparatively comfortable and takes you to your target level. As you progress through a session, you're constantly fighting complacency or overcoming the "inertia" of comfort; as the speed increases, performance (characters copied successfully) decreases and the target speed *feels* fast. Nonetheless, this method does work and is far more effective than most other approaches.

A decreasing-speed algorithm, however, starts you at a speed well beyond your reach and brings you down to your target speed. It is similar to the fast-code practice transmitted over W1AW. As speed decreases, your performance in that session improves and the target speed *feels* slower than it would if you had approached it from slower speeds.

The disadvantage of this method is that you must initially have a higher tolerance for frustration because you'll probably copy few characters at the start speed. This approach would help many students reach their targets more quickly. A decreasing-speed feature is merely a subjective preference, but one I would have liked to have had as an option.

Using the KT-2, you'll quickly find yourself engrossed in an effective and rather enjoyable quest for QRQ skill. The KT-2 is available from Advanced Electronic Applications, Inc., P.O. Box 2160, Lynnwood, WA 98036. Price class: $130. — *Steve Place, WB1EYI*

KLM 21.0-21.5-6A "BIG STICKER"

☐ When the opportunity arose to test KLM's 15-meter "Big Sticker," I jumped at it. The antenna definitely fulfills the "big" requirement. Its six elements are arranged along a 3-inch-OD, 36-foot boom, and it weighs in at 60 pounds.[2]

Like most KLM antennas, this beam employs a dual driven element to achieve a low SWR across the entire band.

The boom comes in three 12-foot sections. Two of the boom sections are swaged at one end to fit inside the center section. A couple of 1/4-20 bolts secure each joint.

Each antenna element is made from two halves joined at the center by a Lexan® insulator. Each element half consists of a 6-foot section of 3/4-inch-OD tubing swaged at one end to accept a 1/2-inch tip of the appropriate length. A 6-inch piece of 7/8-inch-OD tubing reinforces each element half where it joins the insulator. Compression clamps hold the tubing sections together.

The reflector and director element halves are connected electrically by short aluminum straps. The two driven elements are interconnected by aluminum phasing straps. Because of the log-cell driven element, the feed-point impedance is 200 ohms. The review antenna came complete with KLM's model 3-60 4:1 balun, but making a balun from coaxial cable as explained in the instruction manual is easy.

Each element is secured to the boom by a single worm-gear hose clamp attached to the underside of the insulator with two 1/4-20 bolts. Sheet metal screws keep the clamps from twisting on the boom. The boom-to-mast plate and associated U bolts accept a 2-inch-OD mast. A steel truss cable running from a riser on the boom-to-mast plate to aluminum clamps near the ends of the boom provides support.

KLM supplies stainless-steel hardware to bolt the antenna together. They also include a generous supply of Penetrox® , a conductive paste used to ensure good electrical contact at the element joints and balun connections.

This antenna took about four hours to assemble. KLM's excellent instruction manual included a step-by-step assembly outline and detailed drawings with dimensions. Some of the assembly steps were more time-consuming than necessary because of ill-fitting parts. For example, some of the boom-to-element hose clamps didn't quite fit into their spaces on the insulators. Also, on some of the element halves, the machine screws that secure the elements to the insulators didn't quite fit through all of the holes. Eventually, with some filing and a lot of patience, I got the beam together.

My only serious complaint is that I found a wax-like film coating the inside of the swaged end of many of the 3/4-inch element sections. A VOM confirmed that this waxy substance does *not* conduct electricity, so I carefully scraped it off with a sharp knife and then used steel wool to clean up the inside of the element. Upon completion, I was mystified by a small handful of leftover hardware. A careful rereading of the instructions confirmed that I had put on every screw, nut and washer as specified.

Clarke Greene, K1JX, and I installed the beam atop 70 feet of Rohn 25. Clarke pulled while I followed the antenna up, and it was bolted in

[2]m = ft × 0.3048; kg = lb × 2.2

KLM 21-21.5-6A 15-Meter "Big Sticker"

Manufacturer's Claimed Specifications	*ARRL Evaluation*
Frequency of operation: 21-21.5 MHz.	As specified.
Longest element: 25 ft.	24 ft, 3 in.
VSWR: Better than 1.5:1.	See Fig. 1.
Wind area: 8.5 sq. ft.	Not measured.
Turning radius: 20 ft.	22.7 ft.
Material: 6063-T832 seamless tubing.	

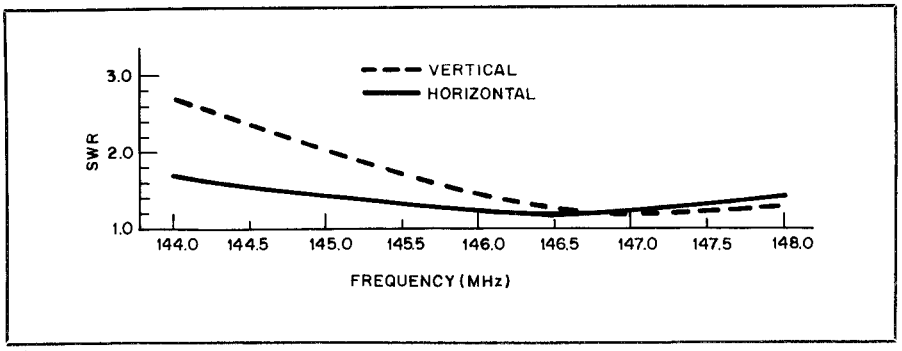


Fig. 1 — SWR curves for the Austin OMNI 2-m mobile antenna. In this installation, the horizontal elements of the test antenna were less than 1/4-λ from the car body (a compact station wagon).

place within 15 minutes of leaving the ground. Most of the weight is in the boom, the elements are short and the antenna is balanced, so installation is relatively easy. The beam is fed with 125 feet of RG-8/U.

On-the-air evaluation confirmed that this big antenna is a big performer. Some casual operation during the cw WPX contest, Field Day and the IARU Radiosport brought many unsolicited "tremendous signal" reports. Received signals were stronger on the KLM than on a 4-element beam at the same height on another tower 60 feet away. This antenna exhibits deep nulls off the back and sides, and I find myself making more small adjustments to the rotor to peak signals than with other 15-meter beams I've used.

Although it remains to be seen if this antenna can survive a New England winter, it has weathered several summer storms with wind gusts in excess of 50 mi/h that felled trees throughout the state. This Big Sticker certainly meets my idea of what a big antenna should do. If you're looking for a big antenna for 15, this one is worth considering. The 21-21.5-6A lists for $500. Manufacturer: KLM, P.O. Box 816, Morgan Hill, CA 95037. — *Mark Wilson, AA2Z*

AUSTIN OMNI 2-M ANTENNA

☐ The question of antenna polarization in vhf mobile work has been with us almost since the first vhf gear appeared in cars. Vertical antenna polarization is favored for obvious aesthetic and mechanical reasons, but horizontal polarization has documented advantages of noise reduction and higher average signal levels in irregular terrain. A 1950s trend to horizontal polarization was reversed with the fm-and-repeaters boom of the 1960s. Since the late 1970s, the effectiveness of ssb communications has rekindled interest in the art of 2-m mobile communication over considerable distances, without the aid of repeaters, mainly through the use of horizontal polarization.

Why not use an antenna that can be changed readily from horizontal to vertical polarization without sacrificing the advantages of both modes? This question was responsible for the development of the OMNI 2-m mobile antenna by Dick Austin, K1QIZ.

How It Works

The OMNI combines an old principle with some new mechanical ideas. It uses two half-wave elements fed in phase, matched to 50-ohm line by means of a corrective stub and a balun. Only the mechanical construction is new.

At the bottom of the antenna is an unobtrusive, chrome-plated cylinder. It is fitted with a threaded stud that can be screwed into a standard Hustler bumper mount or used with a matching 3/8-inch nut to attach the base to any kind of wraparound bumper mount.

The main vertical support is a tapered, white fiberglass tube with diameters of 7/8 inch at the bottom and 1/2 inch at the top. The matching network is entirely within the fiberglass tube. The 50-ohm coaxial feed line, also white, exits through a hole in a chrome-plated sleeve at the bottom of the whip. This sleeve makes a firm slip-on fit to the base assembly. The bottom edge is notched to fit around a steel pin in the base, preventing antenna rotation when the car is in motion. Note that the OMNI has its own transmission line. If you have an hf rig in your car, you do not have to disconnect it when the OMNI is installed.

At the top of the vertical support is a thick plastic sleeve that serves as a mount for the two half-wave elements. These are tapered slightly to give strength at the lower ends while reducing wind resistance. The fed ends of the elements are set into short lengths of solid brass rod that are held in place by means of wing nuts. Slots cut into the plastic mount in the vertical and horizontal planes permit the elements to be fixed in place in a vertical or horizontal position, their alignment being kept at the proper angles by the slots.

For vertical polarization, the elements are aligned with the vertical slots (on opposite sides of the insulating mount), one pointing upward and the other downward. To change to horizontal polarization, loosen the wing nuts and turn the elements to the horizontal plane. The base support is oriented so one element is parallel to the long dimension of the car, pointing forward. The other element is parallel to the rear of the car. The preferred mounting position is at the left rear of the vehicle, as this keeps the elements on the side away from pedestrian traffic. Mounted in this way, the elements are approximately 52 inches above the rear bumper.

An incidental dividend of this antenna and mount design is that the antenna assembly can be removed in an instant for safe keeping. For this purpose, there is a soft plastic clip mounted part way down the fiberglass support and slotted to hold the collapsed elements in place, parallel with the supporting mast.

Performance

Any mobile antenna is bound to be far less effective than even a small directive array mounted in the clear. Still, a vhf mobile enthusiast accustomed to the quarter-wave whip will be pleasantly surprised by results obtained with the OMNI in the vertical or horizontal mode. My first ssb contact while using the OMNI was initiated from my driveway on a small hill in Canton, Connecticut. My CQ was answered by a station on Long Island, about 65 miles away.[3] He was surprised to learn that I was using only 10-W output. Equally good reports have been received out to 75 miles or so over hilly terrain and under essentially normal conditions.

[3]km = mi. × 1.6

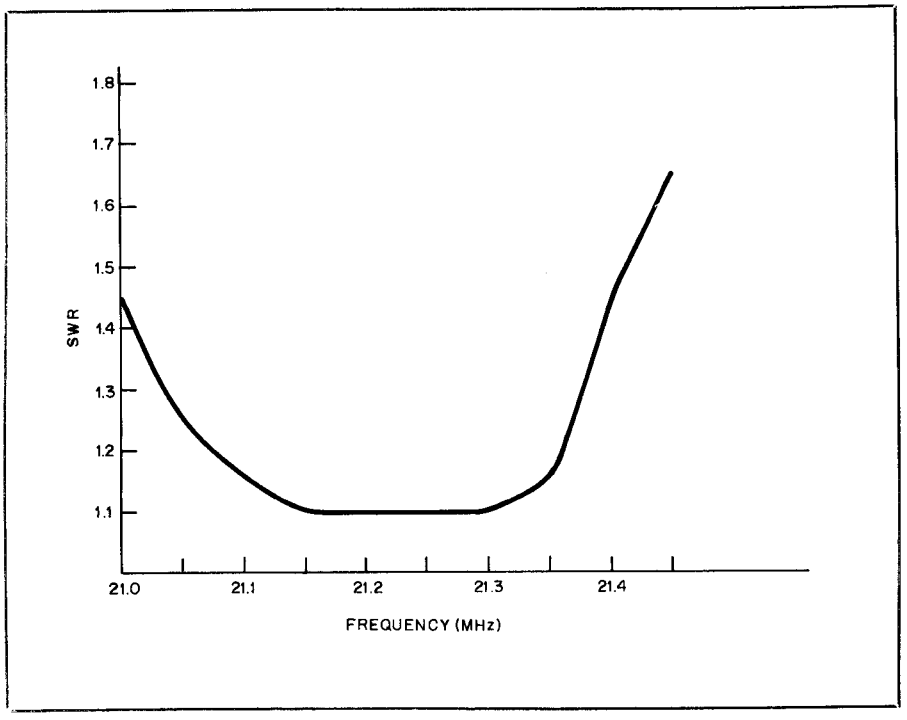


Fig. 2 — SWR curve for the KLM 21-21.5-6A.

Some of the review period was spent in central Florida where the reliable communications range with a 10-W rig, when working with well-equipped stations is contained with a circle roughly 80 miles in diameter. Experience in Florida and on the trip home showed that reliable communications ranges could be extended appreciably with the use of an amplifier; mine delivers 65 watts of output. "Grid" Gridley, W4GJO, also using an OMNI, had just over 100 watts of output available. We both found it possible to often work the Jacksonville and Miami areas about 150 and 230 miles distant, respectively. Gulf Coast tropo contacts out to 400 miles were made before the real season opened for this sort of thing.

Probably the most impressive demonstration of the capabilities of 2-m ssb operation with horizontal antennas was a four-hour continuous contact with W4GJO from his home in northwestern Georgia. This contact continued for 157 road miles (120 air miles) in the hill country of eastern Tennessee. Many other QSOs were held at distances of from 75 to 100 miles in the Shenandoah Valley of Virginia and the Pocono Mountains of Pennsylvania. Almost without exception, the person contacted volunteered the information that he had never worked a 2-m mobile station at that distance before.

The performance of the OMNI as a vertically polarized antenna, working direct and through several repeaters, compares with that of a through-the-glass-fed vertical whip antenna; there is little practical difference in their working range. There may be a difference in the timing of fades, but the signals average out to about the same level. Thus, I am getting good results with the OMNI in fm simplex and repeater work with the dividend of being able to have solid QSOs on ssb over better-than-average distances. The OMNI is a real plus compared with trying to work ssb and fm with a single antenna that favors one mode or the other.

The OMNI can be obtained from Austin Custom Antenna, 38 Terminal Rd., Providence, RI 02905. Price class: $65. — *Ed Tilton, W1HDQ*

SPEEDCALL 312-K TOUCH-TONE® DECODER KIT

☐ The only hams who should be interested in a tone decoder are those building an autopatch, right? Wrong. Why? Because the Speedcall 312-K is actually a selective signaling device. Here are a few examples of its possible use: You want to be available for instant contact on the local repeater, but do not want to be distracted by the chatter of other stations in QSO; you're a DXer who wants instant notification when the rare one comes on; you may be in a RACES or ARES group that must respond in an instant, or you may be working in an extremely noisy environment and wish to receive a visual indication that someone is calling you. Many, if not most, amateurs active on the fm mode could make some use of a selective signaling device.

The Circuit

Tone-decoder ICs have improved dramatically in the last few years. Until recently, an array of seven or eight 567s was typical for tone decoding in most amateur applications. Now we have available stable, false-free decoder ICs that decode all 16 digits. Speedcall's 312-K Decoder is an innovative circuit designed around the ITT 3201 Decoder/Filter IC.

The ITT 3201 is a complete two-of-eight DTMF (Dual-Tone, Multi-Frequency) decoder/filter in a single 22-pin package, requiring a single +12-V supply. Audio for the ITT 3201 is taken from the receiver fm detector. Speedcall has made provisions for taking the audio off before or after de-emphasis.

After processing the received tones, the ITT 3201 produces a data valid signal and a hexadecimal character corresponding to any valid DTMF tone received. The hex output becomes the input for an NC 5200 logic array that functions as a field-programmable sequence decoder. Actually, it is only partially field programmable, and the programming done at the factory is what makes the Speedcall 312-K so versatile and useful. The field-programming portion is accomplished with wire jumpers and allows the user to determine the series of digits required to activate the output (address code). Any sequence consisting of three to eight digits (numbers and/or symbols) may be selected and programmed by the user.

When a valid address code has been detected, the logic array output is fed to an inverter, a latch and a 3-Hz oscillator. The oscillator output drives a transistor, causing it to turn an LED on and off at the 3-Hz rate. This transistor can also be used to drive any low-current 12-V device (such as a relay), to connect to additional signaling instruments, or the oscillator section can be bypassed to create a continuous output. In either case, the output will remain activated until the 312-K is reset manually with the reset switch or until it receives the COMMAND RESET signal, if it has been programmed for this function.

Field Programming

Address code field programming is straightforward. The programmer simply inserts wire jumpers between sockets representing digit output and position (in the sequence) registers. The same digit may be used for more than one position in the sequence, e.g. the 312-K could be programmed to respond to 13356, with the digit "3" being used in the second and third registers (positions).

With the COMMAND RESET option programmed in, the calling operator may reset the 312-K from his station by entering the address code followed by the reset digit — whatever the user has programmed into the 312-K for this function. Thus, if an operator does not respond in a specified period of time, the calling operator may cancel the call and deactivate the signaling device.

The MASTERCALL option permits the sending station to substitute the MASTERCALL digit for any digit or digits in the address code. Suppose a receiving unit is coded for 1598 with # as the MASTERCALL digit. The sending station may send 1598 to address the unit, or he may send #598, ##98, ###8, ####, 1###, #5##, etc. This has uses in situations in which receiving stations can be fitted to some grouping. It could be used to alert selectively a group of DXers all needing the same country, or some subgroup of ARES. The COMMAND RESET option may be used in conjunction with the MASTERCALL option.

Construction

The Speedcall 312-K is reasonably simple to build. If any difficulty is to be encountered, it would most likely be in finding the proper connection point in the receiver. Speedcall suggests that it be connected as near the fm detector as possible, which is not particularly difficult to do if you are familiar with your fm receiver. If not, you would probably be wise to enlist the aid of a local radio technician.

The 3-3/4 × 2-inch circuit board might fit inside some fm transceivers. Connections required are +12 V, common, audio and audio shield (common). Once the device is connected to the receiver, the user is required to tune to a station sending a DTMF signal and adjust a potentiometer on the circuit board to provide a 500-mV signal to the input of the decoder IC. No other adjustments are required.

The unit I built and tested has performed flawlessly over the last few months. I added an external piezo buzzer purchased at Radio Shack. The basic kit is in the $90 price class, while a deluxe version with case, switch and buzzer is in the $105 price class. More information is available from Speedcall Corporation, 2020 National Ave., Hayward, CA 94545, tel. 415-783-5611. — *Peter R. O'Dell, KB1N*

LOGBOOK

☐ Hams do a lot of paperwork. We keep logs, we send, receive and record the sending and receiving of QSL cards, and, for various operating awards, we record states and countries worked and confirmed. Some of us spend as much time shuffling paper as we do rag chewing!

Today, many hams own Radio Shack TRS-80® personal computers. Jerry Crosby, WB8YUO, has written a program for the Models I and III that lessens the paperwork that the active ham encounters. Called "Logbook (Amateur Radio Computer Logbook Program)," the program allows you to log QSOs, search the log, extract data from the log for QSLing, and keep a record of your DXCC, WAS and 6-band WAS progress.

The log includes the QSO date, call sign of the station worked, operator's name, city, state and country of the station worked, frequency, mode and QSO time, exchanged signal reports, and other notes (such as QSL status). Once you have logged a QSO, a program-editing module allows you to make changes and/or corrections at any time.

Searching the log is a two-step process. Let's say, for example, I want to search my log for all contacts made on March 8, 1983. First, I use the indexing module to index the log according to date (the category I wish to search). Next, I use the search module to find all March 8 QSOs. (The search function works very quickly.)

The program provides 12 ways of outputting (to the CRT or a printer) the information found by the searching process. If you desire, you can output the whole log.

The QSL module of "Logbook" allows you to pull pertinent QSO data out of the log and print that data on tractor-fed, self-adhesive labels. The information printed on the label may be personalized by changing some program lines (the program is written in BASIC) to include your station equipment list.

"Logbook" works as advertised. A lot of thought went into the program. Since the program is written in BASIC, the adventurous user may modify the program to meet his or her requirements.

The program requires a minimum of 32K of RAM and one disk drive. It operates with most of the popular disk operating systems available for the TRS-80 Models I and III. "Logbook" is available from Jerry Crosby, WB8YUO, 6333 Willowdale Ct., Columbus, OH 43229. Full documentation and a program diskette are included for $39. — *Stan Horzepa, WA1LOU*