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A North Carolina Mini Beverage

In January '88, with the onslaught of cold weather in North Carolina—and a for-real, 2-inch snow: probably the worst time for the erection of any antenna, I finally overcame inertia and constructed a 700-foot mini beverage, after nearly two years of living here in North Carolina.

We are fortunate to have a 50-acre wooded plot of land immediately behind (northeast of) our home in Grifton. It shields my DX workings from much of the usual powerline noise, as my 75-foot longwire is sited parallel to the rear property line, on an axis of 135/315°.

Unfortunately, as an affirmation of Murphy's Law, it was discovered that the longwire has a deep null (about 20 dB) toward about 45°, and Europe. That such an electrically-short (at MW) wire could develope such a null was a reminder that a short beverage could be a very interesting project.

In summer of 1983, while still in Okinawa, I erected what I dubbed OKIBE (oh-KEE-bee), a 1,000-foot Okinawa beverage. Actually, I laid it on the ground, with an orientation of 15/195°, and terminated it toward Taiwan. I took no notes nor tapes of this event, but I remember the gain that it exhibited, especially of the Fu Hsing ("Reconstruction") B.C. stations in Taiwan on 1512 kHz. These were usually rather weak, but on this occasion were armchair copy with highschool baseball playoffs being broadcast at the time.

This next effort, ENCEBE, was to be at least reasonably well documented.

My advice to whomever has considered the construction of a beverage antenna: Don't consider it, DO it. I had long contemplated the underbrush in the forest next to our humble hovel, weighed the difficulties of erecting a beverage through it, and talked myself out of it. I had, however, gathered together the materials for a beverage, against the day that I might encounter optimal conditions.

Came a four-day weekend, and the snow (naturally), but—what the hey—I'll do it anyway.

Construction took three hours, and was a one-man evolution. I suspended a 1,000-foot spool of #24 AWG, plastic-insulated wire on a 3-foot length of plastic clothesline between two convenient supports, such that the spool played out wire smoothly in the direction that the wire was being suspended. I fed the wire out through a steel pulley suspended from the eaves of our house. To the end of the wire, I attached a 3/8-inch steel hook as a messenger (to provide weight for tossing the wire over tree branches, and an aperature for snagging the wire with a gin pole). Tossing the hook-weighted wire over tree branches in a straight line from the rear of our house, and grabbing the hook manually, or with the gin pole (when the hook came to rest suspended from a tree branch too high to reach by hand), I pulled the wire out toward 45° until I reached the limit of extension of the antenna, in this case, the edge of the forest that faces a street on its northeast perimeter. At that point, I terminated the far end of the wire temporarily on a ground rod, then returned to the spool end of the wire, and cut it long enough to wrap back on itself on the pulley, and then passed it through a window to the DX den. No especial care was taken to insulate the wire, as it was already plastic insulated. As the antenna is temporary, the probability of abrasion of the insulation by tree branches and by bushes wasn't considered. Since the wire wasn't too long, I was able to sight in on our garage during the entire evolution. As constructed, the ground termination consists of three Radio Shack ground rods driven into the earth in a straight line at five-foot intervals.

The antenna averages close to 9 feet above ground. That and a wire gauge of #24 AWG indicates a characteristic impedance of 600-700 ohms. Since the ground resistance of the three rods as measured back through the wire with respect to receiver ground (which is tied to the Town of Grifton water system) averages 650 ohms, I terminated the wire directly to the rods without an intervening terminator resistor. True, the r-f resistance of the rods is likely higher, so additional rods are implied.

ENCEBE was erected mostly to give me first-hand experience with a beverage antenna. Being comparatively short for M-W frequencies, it wasn't expected to perform as a longer antenna; nonetheless, the results were interesting and enlightening enough to justify the perhaps 5 hours total time expended in gathering materials for, and erecting the beverage.

OBSERVATIONS In general, as expected, ENCEBE shows a sensible gain at around 45° azimuth, as referenced to receptivity at right angles to the wire (135/315°). There is a sizeable rear lobe (around 225°), indicating the possibility of improving the match of the termination to the beverage wire. There are some deep nulls also—especially at an azimuth of 130°, wherein two graveyarders in New Bern practically disappear.

However, it is the skywave performance of ENCEBE that is the most remarkable. Understand that the accompanying graph depicts the 0° elevation receptivity pattern, i.e. toward the horizon. But, at some elevation toward an azimuth of 46°, ENCEBE has a very pronounced lobe—meaning that skywaves (which approach the

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earth at a slant) arriving from 46° east of north, are captured with considerable gain.

In comparing the gain of ENCEBE to that of my Space Magnet SM-2, it was found that the two are very similar, such that I used the SM-2 as a reference for establishing approximate signal intensities from the stations listed in the graph, without using corrective factors. In order to set up the reference (e_ℓ), the SM-2 was carefully tuned for maximum at each frequency, and then turned until a peak was found on the station indicated. I avoided frequencies on which there were two signals of nearly equal intensity.

The headings of the graph, aside from callsign, location, and frequency, are azi, or the azimuth from which the signal arrives; e_ℓ, or the output of the SM-2 as registered on the carrier meter of my R-390A/URR, in dB; e_B, or the output of ENCEBE likewise registered; $e_\ell - e_B$, or the numerical value of the SM-2 output minus the ENCEBE output. * in the e_B column indicates that the station in question was so weakened that the value of e_B is influenced by interfering signals, and is higher than is the true value of the station's signal.

Note that two measurements were made of WELS-1010 Kinston, one on R-390A band 500-1000 kHz, and one on R-390A band 1000-2000 kHz.

Finally, a list of line items and corresponding comments are to be found after the graph.

I hope that this will pique your interest in erecting your own beverage. I know it was well worth my time and effort, and I will seize the next opportunity to erect a longer one.

ENCEBE receptivity (groundwave)

kHz	call	azi°	e_ℓ	e_B	$e_\ell - e_B$	
540	WETC	303	73 dB	76dB	+6dB	NC Zebulon
550	WDLV	265	60	55*	-5	NC Pinehurst
570	WLLE	293	67	63	-4	NC Raleigh
590	WGTM	312	82	81	-1	NC Wilson
600	WSJS	290	65	60*	-5	NC Winston-Salem
620	WDNC	240	72	69	-3	NC Durham
630	WMFD	200	70	51*	-19	NC Wilmington
640	WFNC	255	76	52*	-24	NC Fayetteville
680	WPTF	293	77	73	-4	NC Raleigh
710	WEGG	222	65	60	-5	NC Rose Hill
730	WFMC	272	79	73	-6	NC Goldsboro
740	WMBL	138	68	63	-5	NC Morehead City
750	WAUG	297	63	58	-5	NC New Hope
760	WCPS	352	75	71	-4	NC Tarboro
770	WLWL	258	63	58*	-5	NC Rockingham
780	WCKB	267	80	63	-17	NC Dunn
790	WTAR	89	70	68	-2	VA Norfolk
810	WCEC	333	72	70	-2	NC Rocky Mount
820	WRFA	212	55	44	-11	FL Largo
850	WKIX	293	71	64*	-7	NC Raleigh
880	WRRZ	242	71	68	-3	NC Clinton
890	WHNC	321	63	58	-5	NC Henderson
90	WIAM	44	77	73	-4	NC Williamston
910	WLAS	180	76	68	-8	NC Jacksonville
930	WRRF	61	82	82	0	NC Washington
960	WFTC	229	85	83	-2	NC Kinston
970	WRCS	16	63	63	0	NC Ahoskie
980	WAAV	205	68	62	-6	NC Leland
990	WBTE	32	70	68	-2	NC Windson
1010	WELS	229	83	81	-2	NC Kinston
1010	WELS	229	81dB	79	-3	NC Kinston
1040	WSGH	290	50	36*	-14	NC Lewisville
1050	WCMS	29	61	61	0	VA Norfolk
1070	WNCT	13	83	80	-3	NC Greenville
1090	WBZB	283	64	55	-9	NC Selma
1110	WBT	269	53	46*	-7	NC Charlotte
1130	WPYB	270	60	52	-8	NC Benson
1140	WRVA	358	61	57	-4	VA Richmond
1150	WGBR	272	75	69	-7	NC Goldsboro
1160	WYRU	249	56	49	-7	NC Red Springs
1170	WCLN	242	62	58	-4	NC Clinton
1230	WISP	229	79	73	-6	NC Kinston
1240	WJNC	180	63	59*	-4	NC Jacksonville
1250	WGHB	330	75	75	0	NC Farmville
1260	WZDO	44	59	62	-3	NC Edenton
1270	WMPM	280	68	59*	-9	NC Smithfield
1280	WVAL	01	68	63	-5	NC Scotland Neck
1290	WJCV	180	65	60	-5	NC Jacksonville
1300	WSSG	272	69	55	-14	NC Goldsboro
1310	WGH	24°	65	61	-4	VA Newport News
1320	WWGN	61	74	71	-3	NC Washington
1330	WCPQ	138	63	43*	-20	NC Havelock/Ch. Point
1350	WLLY	312	68	57	-11	NC Wilson
1360	WCHL	294	60	51	-9	NC Chapel Hill
1370	WLLN	272	62	55*	-7	NC Lillington
1380	WSFL	130	71	57	-14	NC New Bern
1390	WEED	333	68	61	-7	NC Rocky Mount
1410	WSRC	240	61	54	-7	NC Durham
1420	WVOT	312	69	56	-13	NC Wilson
1430	WDJS	251	67	61	-6	NC Mount Olive
1450	WNOS	130	70	51*	-19	NC New Bern
1460	WAKS	283	62	51	-11	NC Fuquay-Varina
1470	WPNC	49	62	60	-2	NC Plymouth

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1490	WLOJ	130	70	56*	-14	NC New Bern
1520	WARR	830	58	44*	-14	NC Warrenton
1530	WOBR	72	60	57	-3	NC Wanchese
1550	WBZQ	13	77	70	-7	NC Greenville
1560	WTRQ	235	71	68	-3	NC Warsaw
1580	WJIK	180	69	63	-6	NC Jacksonville/LeJ.
1590	WHPY	251	66	60	-6	NC Clayton
1600	WJQI	36°	57	57	0	VA Chesapeake

some notes on reception with ENCEBE (all daytime except *)

kHz	call	comments
550	WGAI	Elizabeth City, NC is only about 6 dB over WVOC Columbia, SC, on SM-2, but is alone on ENCEBE.
630	WMFD	Wilmington, NC: 70dB on SM-2, disappears on ENCEBE leaving a weak WMAL, Washington, DC.
640	WFNC	Fayetteville, NC: 76dB on SM-2. Much weaker (52dB) on ENCEBE, with much interference in evidence.
660	WESC	Greenville, SC, weak, but on top on SM-2. On ENCEBE is buried under a medium strength skywave signal from WNBC, New York.
710	WEGG	Rose Hill, NC: 65dB on SM-2, a semilocal. 60dB on ENCEBE, and WOR, New York clearly audible beneath on skywave.
850	WKIX	Raleigh: 71 dB on SM-2, a semilocal, with very slight WNIS, Newport News QRM. On ENCEBE WNIS is almost equal to WKIX.
880	WRRZ	Clinton, NC: 71dB on SM-2. 68dB on ENCEBE, and WCBS, New York clearly audible beneath on skywave
1240	WGBB*	Freeport, NY: is a regular here at night on ENCEBE Not audible on SM-2.
1240	WSNJ*	Bridgeton, NJ: another one logged on ENCEBE.
1270	WMPM	Smithfield, NC: 68dB on SM-2, with WTJZ, Newport News weak beneath. On ENCEBE, WTJZ is nearly equal to WMPM.
1330	WCPQ	Havelock/MCAS Cherry Point, NC: 63 dB on SM-2. Gone entirely on ENCEBE, with WLAT, Conway, SC; and WESR, Onley-Onancock, VA, taking its place.
1340	WMID	Atlantic City, NJ: Frequently audible at night on ENCEBE, but also audible at times as late as 1100, and as early as 1300 EST, at near midday
1400	WOND*	Pleasantville, NJ is another frequent visitor at night on ENCEBE.
1450	WNOS	New Bern, NC: 70dB on SM-2, a semilocal. Much weaker, and equal to WLPM, Suffolk, VA, on ENCEBE
1490	WLOJ	New Bern, NC: 70 dB on SM-2, also a semilocal. Disappears completely on ENCEBE, to be replaced by WRMT, Rocky Mount, NC, and other unIDs.
1600	WLNG	Sag Harbor, Long Island: Another frequent visitor here at sunrise and sunset.