DX TOOLS
by
RadioPlus+ Electronics

Thanks for requesting this brief, interim catalog of RadioPlus+ DX products. Although we have registered a domain name and are contemplating a Web presence, we must first evaluate production capacities before committing to a full-scale assault on the world-wide web. In the meantime, this initial description of our products is being e-mailed to those who request it.

Please excuse the "plain-Jane" nature of this mailing. At the time this is being written, some of our new products are not yet back from the screen printer so final photos are not available. Secondly, to keep things simple (and formatting problems under control), this catalog is available in two formats: Microsoft Word and simple text.

The following DX Tools are in our line-up:

Quantum Loop QX (now shipping)
Quantum Loop QX Pro (shipping early December, 2000)
Quantum Phaser (shipping early December, 2000)
Quantum Stick+ (now shipping)
Quantum Coupler (now shipping)
Quantum Battery Pack (shipping early December, 2000)

The DX Tools

Quantum Loop QX

The Quantum Loop QX is the replacement for the discontinued Quantum Loop. The original Quantum Loop remained essentially unchanged since its inception mainly because it was a successful design and no worthwhile improvements were apparent. After experimenting with various regeneration approaches (and generally being disappointed with the usual "ho-hum" results), a final regeneration (or Q-multiplication (i.e., "QX")) circuit was developed that results in marked improvement in the performance of the Quantum Loop. That is, by careful adjustment of the QX controls (i.e., the QX and Tune knobs), a significant sharpening of the tuning passband can be obtained along with a noteable increase in signal level.

(Note: Unlike some designs, the QX is usually capable of introducing regeneration to the point of oscillation; in other words, the QX is not a "halfway' regeneration approach. The controls permit a high level of positive feedback as well as in-phase adjustment for maximal regeneration. The only comparable Q-

multiplication performance that I've experienced (and I've tried many) is that of the Hammarlund HQ-150.)

Another difference from the original Quantum Loop is the addition of a Q-spoiling switch. This switch is normally in the Off position (i.e., permitting maximum tuning sharpness) but was added to allow the use of the QX with the Quantum Phaser (below) where it is sometimes necessary to broaden the loop's passband to permit maximal nulling of a strong local.

Like the original Quantum Loop, the QX covers the MW band (about 530 - 1700+ kHz), has a two-stage, differential input JFET/MOSFET amplifier (yielding 40+ dB of gain) with level control, and a 7-1/2" RadioPLus+ custom ferrite rod housed in an acrylic and chrome, detachable, plug-in head that rotates 360 degrees and tilts for optimal nulling. The amplifier housing is metal and has a sloped face for easier knob manipulation; colors are black and chrome.
Tuning is accomplished via a low minimum capacitance variable capacitor (as opposed to a varactor), the rod's coil is wound with heavy Litz wire (for maximum Q, or tuning sharpness) and is doped, semi-conductors were selected for low noise-floor characteristics (and are made by known manufacturers, e.g., Motorola), the tilting/rotating surfaces are treated with a Teflon/Fluon compound for smoother adjustment, etc. In other words, we've made the QX as good as we could (within reasonable cost parameters). The power requirement is 9-15 VDC via either an AC adapter (supplied) or a 9 VDC battery (not supplied); output is approximately 50 Ohms and is routed to the receiver by way of a UHF-UHF (PL-259) cable, also supplied. Overall dimensions are: Base: 5"x7"x2-1/2"; Head: 8-1/2"x2-3/4"x1-3/4".

COST: $199.00 (+$7.00 SHIPPING (USA)
Note: Members of the National Radio Club or the International Radio Club of America may deduct 10% from the item's cost (not shipping though).

Quantum Loop QX Pro
The Quantum Loop QX Pro is similar to the Quantum Loop QX but with several important differences:

- *Covers 150 kHz to 2 MHz utilizing separate, optimized LW and MW coils located in the same loop housing and selected by a switch.
- *Uses a 15" ferrite rod (as opposed to 7-1/2").
- *Has a variable Q-spoiling potentiometer (compared to the QX's one value).
- *Has a modified amplifier for improved performance below 500 kHz.
- *Has a physically larger loop head and amplifier base (see photo).

The QX Pro retains the all of the other features of the QX including regeneration.
Note: If you are primarily a MW DXer with no interest in the LW band, be advised that the performance difference on MW between the QX and QX Pro amounts to about a 4-6 dB advantage for the Pro on only the very low end

(<~600 kHz) of the band. A much more prudent move would be to combine the QX with the Quantum Phaser for a greatly enhanced advantage.

Target shipping date in early December, 2000.
COST: Final cost to be determined upon final supplier costs but expected to be between $275-$300...email after December 1, 2000 for final price.
Members of NRC/IRCA may take the usual 10% discount on the loop.

Quantum Phaser

After years of experimenting with literally almost two dozen phaser designs ranging from standard LRC approaches to delay line designs to various JFET-as-bridge configurations, I finally settled on the current Quantum Phaser. My principal design criteria were (1) effectiveness and (2) ease of use. While not the most flexible phaser circuit I've used, it is effective and very easy to use.

The Quantum Phaser is a broad-band (i.e., untuned) phasing circuit that is used to combine the signals of two antennas (wire or loop) in such a way that a single null is created and can be "steered." In practical terms, this permits (in many instances) the nulling of a pest station to such a degree that weaker, previously masked signals become audible. Unlike a loop antenna with its figure-8 pattern and two opposing nulls, the Quantum Phaser creates a single null thereby allowing stations in directly opposite directions to be nulled independently. When the two antennas are a rotatable loop and "long wire," a cardioid pattern is generated that effectively creates a null on one side of the loop while doubling (i.e., 6 dB or one S-unit) the voltage of a signal on the opposite side. In my experience, adding a phaser to my DX toolbox opened up new DX possibilities, much like when I added a loop to my previous "longwire"-only antenna farm.

The Quantum Phaser is undoubtedly the easiest to use phaser I've ever experienced. There are only five controls (other than the on/off switch) on the front panel: Antenna Select switch; Antenna A Level control; Antenna B Level control; Phasing knob; and Phase Invert switch.
Conceptually, there are two conditions you are trying to attain by manipulating the controls to effect a null:

1. Equal signal levels for the two antennas
2. Opposite phases of the two antennas.

The first condition is attained by using the level controls and the antenna select switch. The second condition is reached by rotating the phase knob. The phase invert switch selects either the peaking or nulling of the target signal.
With practice, you should be able to null semi-locals in less than 10 seconds; strong locals can take decidedly longer as careful (and sometimes tedious and touchy) adjustment of the controls is necessary.
Note that a phaser such as the Quantum Phaser (and every other phaser that I'm aware of) is capable of manipulating the relationships of only two phases. That is, if one or both of the signals are presented to the phaser with unusual

phase distortions (resulting from, for example, multipath distortion, re-radiation from nearby objects, etc.), a complete null cannot be achieved. At my location, however, I am able to completely null all of my locals (which range in strength from S-9+20 dB to S-9+40 dB) by keeping my shack relatively RF-tidy. Semi-locals (100-150 miles) sometimes are problems in that both ground-wave and sky-wave signals (with their differing phase characteristics) can reach the phaser and it is able to manipulate only one of the phases. In this case, only partial nulls are possible.

The Quantum Phaser, as mentioned, is a broad-band circuit utilizing a passive front-end, double-bridge phasing arrangement with a post-phasing 10-15 dB JFET/NPN amplifier. It is housed in the same size cabinet as the Quantum Loop QX with its sloping front panel and is painted semi-gloss black. Output is low impedance via a UHF jack/cable (supplied), both ends terminated in a PL-259 connector. Power requirement is 9-15 VDC (12 VDC adapter supplied). A 9VDC battery provision is not supplied (due to current drain) but the Quantum Phaser can be powered by a car battery or the 8 D-cell Quantum Battery Pack (below).
Note: The Quantum Phaser is designed for use on the MW band (530-1700 kHz). While phasing effects occur between 300 kHz and 3 MHz and beyond, use of the Quantum Phaser on LW is not recommended unless tuned antennas are used (to prevent MW feedthrough). Similarly, propagation irregularities on the SW bands limit the use of the phaser to only particular situations. In the future, I hope to make available a Quantum Phaser Pro with tuned circuitry and other bells and whistles. For now, I believe that the Quantum Phaser will satisfy the needs of most MW DXers.

Target shipping date is early December, 2000.
Cost: $135.00 (+$5 shipping USA).
NRC/IRCA members take 10% discount.

*Quantum Stick***+**
The Quantum Stick (also known as the “Q-Stick”) is a passive, oversized (7-1/2”) ferrite rod/coil assembly that boosts the output of portable radios that use a ferrite rod antenna. The signal that the Q-Stick gathers is inductively coupled to the portable radio’s internal ferrite rod antenna (thereby bypassing the usual attenuating network(s) that portable radio external antenna circuits/jacks generally have).
In use, the Q-Stick is placed near and parallel to the internal antenna of the portable, and tuned (via variable capacitor) for a signal peak. The Q-Stick covers LW and MW (i.e., 150 kHz - 1700 kHz) and has a provision for attaching an external antenna.

Now shipping.
Cost: $52.00 (+$4 shipping USA)

NRC/IRCA members take 10% discount

Quantum Coupler

The Quantum Coupler is a device used to couple the output of the Quantum Loop series to a portable radio. It attaches to the output of the loop and is placed near and parallel to the ferrite rod of the portable. This effectively bypasses the external antenna attenuation circuitry that most portable possess, thereby greatly increasing the signal to the radio. Note that the front-ends of some/most portables are not able to handle large signals without overloading (thus, the attenuating circuitry via the external antenna jack). Therefore, the distance of the coupler from the radio must be adjusted and/or the gain control on the loop lowered to prevent overload.
The Quantum Couple is *not* intended for use with whip antennas.

Currently shipping.
Cost: $15.00 (+$4 shipping USA)
NRC/IRCA members take 10% discount

Quantum Battery Pack

The Quantum Battery Pack (still undergoing design) will house 8 D-cell batteries to power the Quantum Phaser or Quantum Loop series. The 12 VDC provided by the battery pack is preferable to the use of a 9 VDC battery in that greater dynamic range and extended battery life is attained. It will have two connectors to power both the Quantum Loop and Quantum Phaser. Powering these two devices, the 8 D-cells should last a minimum of 75-100 hours.

Available December, 2000
Cost: To be determined.

Payment is acceptable at the present time via personal check (must clear) or money order. Arrangements are underway with PayPal to accept credit card orders but have not yet been finalized.

Again, thanks for requesting this “catalog.”

73’s...Gerry Thomas

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Please realize that we are a very small shop with only two employees (plus subcontracted labor) and that we generally make products in production runs of about 20-25. It is strongly advised that you contact us (preferrably by email) to

confirm the availability of a product before placing an order (and avoid possibly undergoing a frustrating wait).

Remember this...that megabucks receiver you got is only half the story, the antenna is the other half.

"*A mediocre receiver with a great antenna will always outperform a great receiver with a mediocre antenna."*

Sorry for the poor photo but final catalog will have pro photos of the final production models. Left to right: Quantum Loop QX (production model); Quantum Phaser (pre-production model); Quantum Loop QX Pro (preproduction model); Q-Stick+ (production model). Not shown: Quantum Coupler and Battery Pack.