



General Catalogue

Featuring the Sherwood / Drake R-4C

Still the Finest Competition-Grade Receiver

Receiver performance tests, found in the center of this flier, were taken on current, popular receivers and transceivers. Dynamic-range measurements were made using two equal-strength test signals 2 kHz apart to approximate a "real-life" pile up, plus the more normal 20-kHz spacing. A few radios had to be tested at 50 or 100 kHz because of synthesizer noise. (See below for additional details.) Some units, due to limitations in their i-f filters or board layouts, had excessive test-signal leakage, requiring close-in measurements be made at 3- or 4-kHz spacing. AGC threshold, the point below which audio falls off rather linearly with signal, is listed in microvolts across the antenna input (assumed to be 50 ohms). Also listed is the drop in audio-output level at this AGC threshold, as compared to a 5 mV (typically S9 + 40 dB) signal. Tests were made using a 500- or 600-Hz CW filter, when available.

Receiver noise floor can be degraded by the reciprocal mixing of an adjacent strong signal with phase noise from local oscillators, LO amplifier stages, phase-locked loops, or synthesizers. Noise from the receiver LO chain is listed for a normalized bandwidth of 1 Hz at a given kHz offset in dB below the LO carrier (dBc). To calculate actual noise from the table for a given filter: Integrated Noise =

Table Value N minus 10 log (filter bandwidth in Hz). Thus an LO with noise 100 dBc and a filter 500 Hz wide would degrade the noise floor at least 3 dB (at the listed signal spacing or less) whenever a signal was 73 dB above the receiver noise floor (about S9 + 15 dB). 120 dBc or greater is desirable.

A rating of front-end selectivity is provided, with broad delineations of A through F, rating the ability to reject out-of-band signals. A tracking pre-selector is graded as A+, while no input selectivity would be F.

Receiver ultimate rejection is listed to the nearest 5 dB. This shows whether signals two or more filter bandwidths off frequency will be heard as undesired leakage. Ultimate rejection of 120 dB will not show leakage until approximately S9 + 60 dB.

Also in this flier is information on our complete line of products, plus certain circuits to improve specific subsystems in the R-4C. Most of our modifications have been published in *ham radio* magazine. We offer assembled PC board update kits, along with in-house installation services. For further explanation of our receiver testing procedure, see: "Present-Day Receivers - Some Problems and Cures". *ham radio*, December, 1977, page 10.

Reprints available from us on request.

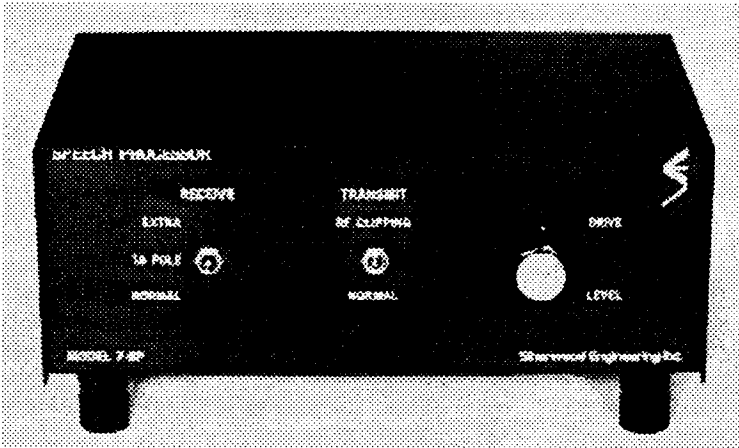
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VISA MasterCard & American Express Welcome

RF Speech Processors for Drake TR-7, T-4XC, Signal/One



The Sherwood RF speech processors provide no-compromise RF/IF envelope clipping for high intelligibility and unexcelled talkpower. A specially designed 8-pole IF crystal filter drives a highly effective active hard limiter (clipper), followed by your rig's 8-pole crystal filter: the keys to highest processing efficiency. Great care has been exercised in developing reliable, ultra-fast, high-isolation pin-diode switching of filters and clipper stage. Full 8-pole, low-leakage receive (where applicable) and transmit capability is realized. Processors are rig powered, and are easy to interconnect with your equipment. No hole drilling is required.

4-SP for the 4-Line transmitters (T-4X, T4XB, and T-4XC) has separate LSB and USB 8-pole filters, of carefully chosen bandwidth, for proper filtering ahead of its clipper. The highly versatile 7-SP Mk II for the TR-7 not only improves your transmitted signal, but offers automatic transmit/receive switching as well as the option of selecting either the processor's special transmitting crystal filter for 16-pole, 1.9-kHz receive bandwidth, or, in addition, its accessory CD-1.7K/8 filter in the Mk II for receiving under extremely heavy QRM. This allows room for other

filters in the TR-7 itself, and selection of up to eight bandwidths.

All units have filter selection and clipper in/out switches, plus an output control after the clipper (for proper final/PA drive adjustment from band to band, or for precisely setting linear-amplifier excitation level). Clipping is adjusted by the rig microphone gain control. Each processor is housed in an attractive 8x5x3-inch charcoal-colored cabinet, accented with white lettering, that blends well with all Drake equipment. High-quality machine-screw construction is used with top and bottom removable for easy access to both sides of PC board.

Model 7-SP Mk II for the TR-7 and the 4-SP Mk II for the 4-Line transmitters sell for \$395.00. 11-SP for CX-11A is \$245.00. See later page for CS, Signal/One filters.

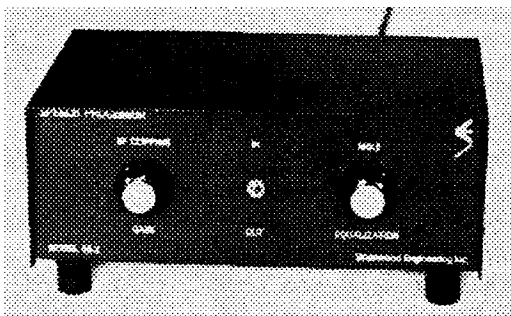
The Mk III processors provide even greater transmit efficiency by replacing the transmitter filter(s) and moving the transmitter filter(s) to the processor.

For the T4-XC, a 4-filter matched set is recommended. Additional filter set: \$199.00.

Shipping: \$10.00. Overseas air, \$35.00. Overseas insurance, \$10.00.

Mike-Line Equalizing RF Speech Processor / Clipper

Contains 16 Poles



The SE-2 Speech Processor is for any brand of transmitter or transceiver. An outgrowth of the Sherwood no-compromise RF/IF processors, combined with our highly-versatile SE-1 mike equalizer, the ultimate in mike-line processors.

Why a Sherwood Audio/RF/Audio processor? Up until now, if you did not own a Drake product, you were limited to less-sophisticated units, or, maybe you did not wish to open your set and install an IF-type processor. In either case a third option is available, assuring excellent talkpower and high processing efficiency.

While the SE-2 has a complete transmitter and receiver inside (to process at RF), it is easy to use with only three controls on the front: clipping gain, in/out, and mike equalization, plus an output pot on the rear panel, providing a range of levels that can drive any rig.

- Quality inside and out. SE-2 is made for performance, not low cost.
- Two different, specially designed, 8-pole crystal filters, one type before clipping, and the other design after. (No cheap filters like most other units!)
- Wide dynamic-range IC balanced modulator and product detector.

Built-in microphone equalizer for proper frequency response before clipping, assuring maximum intelligibility. Each mike (high or low impedance) can be equalized to its maximum performance.

- Low distortion in the critical audio stages.
- Adjustable clipping level, 0 to 30 dB or more. Equalization 0 to 20 dB.
- Hard, active IC clipping, not just diodes.
- Clipping threshold at mike input less than 1/2 mV, yet handles high-output microphones without overload!
- Auxiliary mix for phone patch or tape recorder. Easy to install. No transmitter modifications required.
- Attractive 8x5x3-inch metal cabinet; machine-screw construction.
- Operates from 11-24 V. AC or DC. Optional transformer available.
- Versatility, quality, performance; for the amateur who demands the best.
- Model SE-2: \$395.00. Shipping per order: \$10.00; overseas air: \$35.00.

600 Hz 6-Pole First-IF Crystal Filter for Drake R-4C

Improve the early-stage selectivity of your Drake R-4C with the time-proven, optimum-bandwidth, low-loss CF-600/6 first-IF CW filter.

Eliminate those high-pitched beat notes from signals that leak around the switchable second-IF crystal filter.

Improve ultimate rejection to better than 130 dB, unlike competing units.

Eliminate the chance of strong signals overloading the second mixer, causing intermodulation and desensitization.

Low loss for full sensitivity. Compare the stock filter to the CF-600/6:

| | Stock | CF-600/6 |
|------------|--------|----------|
| BW -6 dB: | 8 kHz | 600 Hz |
| BW -60 dB: | 32 kHz | 2 kHz |
| Poles: | 4 | 6 |

The CF-600/6 is optimized for beat notes of 400 to 800Hz on the lower sideband of zero beat, maintaining transceive CW capability.



Both the stock filter and our CF-600/6 can be mounted in the receiver and relay switched, allowing both SSB and AM as well as optimized CW operation.

An optional filter switch kit is available for \$75.00. It consists of a PC board, two TO-5 relays, sockets, and hardware. No hole drilling is required, and a special pre-punched shield is provided for easy installation.

Selection of the CF-600/6, independent of the mode switch, allows it to be used with the second i-f CF-1.0K/8, CF-1.7K/8, or standard SSB filter when a wider scanning bandwidth is desired.

The low-loss CF-600/6 sells for \$85.00. Please add \$5.00 shipping-handling per order. Overseas air: \$15.00.

R-4C Custom Front-Panel Switch & Custom AF / RF Gain Knob Set

Our custom front-panel AGC/First i-f filter switch is available again. This dual-concentric switch replaces the present AGC switch, providing not only AGC, but DC control for our i-f filter switch kits. In addition, two more AGC positions are provided to better optimize AGC speed to varying conditions and modes.

The switch with its custom matching knob set is \$49.00.

Also available is our custom AF/RF knob set. This pair of concentric knobs replaces the present knob/tab arrangement. The brass insert on the present RF gain tab is re-used. The new knobs are more functional than the original, yet look like stock equipment.

The AF/RF gain knob set sells for \$19.00. Shipping: \$5.00 per order, overseas air: \$10.00.

SSB 8-Pole First-IF Crystal Filters for Drake R-4C

Improve the early-stage selectivity of your Drake R-4C by adding eight additional poles with an internally-mounted, switchable set of first-IF filters.

16-pole total receiver cascaded filter selectivity.

Reduce QRM, leakage, overload, and eliminate blanker false-triggering from adjacent stations.

Ideal for DX and contest work. Overall shape factor 1.4.

Maximum skirt selectivity with maximum intelligibility.

Modest variable bandwidth can be obtained by offsetting first and second-IF filters with passband tuning control.

Total bandwidth with CF-2K/8 and FL2400: 1900Hz at -6 dB, 2700 Hz at -60 dB.

Ultimate rejection better than 130 dB. Low loss for full sensitivity.

Two-filter switching with PC board and relay sockets: \$75.00.

Three-filter switching with 2 PC boards and sockets: \$150.00.

Four-filter switching with 2 PC boards and relay sockets: \$225.00.

See **R-4C Custom Front-Panel Switch** under *CF-600/6, 600-Hz 6-pole crystal filter*.

LSB and USB CF-2K/8 filter pair \$225.00. Add \$5.00 shipping, \$15.00 overseas air.

5 kHz First-IF Filter for R-4C

Improve the early-stage selectivity of your Drake R-4C by replacing the 8-kHz 4-pole unit with our 5-kHz 8-pole filter.

Reduces high-pitched QRM and leakage.

Lower-cost alternative to CF-2K/8 system; no relay switch kit required.

Low loss for full sensitivity.

Recommended for SWL operation, especially with CF-4K/8 and CF-3K/8 AM filters.

CF-5K/8 filter: \$125.00.

Please add \$5.00 shipping/handling per order. Overseas airmail: \$10.00

1700 Hz SSB 8-Pole Second-IF Crystal Filter for R-4C

Improve SSB selectivity of your Drake R-4C by adding an optimum-bandwidth 1700 Hz filter.

Reduce adjacent-channel QRM through narrower bandwidth.

Ideal for DX and contest work.

Plugs directly into CW 1.5 (or CW 1) accessory filter socket on rear of set.

Easily installed in less than two minutes. No wiring required.

Bandwidth: 1700 Hz -6 dB, 2900 Hz -60 dB.

Low-loss design maintains full receiver sensitivity.

Full passband tuning retained for optimum placement of selectivity under varying conditions.

CF-1.7K/8 sharp SSB filter sells for \$95.00.

Please add \$5.00 shipping/handling per order. Overseas airmail: \$10.00.

Drake 7-Line Filters

Choose standard bandwidths and Sherwood originals to meet all TR-7(A) and R-7(A) needs.

AM:

- CD-6K/8, CD-4K/8, CD-3K/8 8-pole filters: \$95.00 each.

SSB:

- 16-Pole (See 7-SP Speech Processor for this feature.)

RTTY:

- CD-1.0K/8 wide-shift RTTY plus scanning CW filter: \$95.00.

CW:

- CD-500/8 500 Hz CW: \$95.00
- CD-200/8 200-Hz CW: \$95.00

R-4C Filters

AM:

- CF-6K/8, CF-4K/8, CF-3K/8 8-pole filters: \$95.00.

SSB:

- See CF-1.7K/8 Sharp SSB filter.

RTTY:

- CF-1.0K/8 wide-shift RTTY or scanning CW filter: \$95.00.

CW:

- CF-250/8 sharp: \$95.00.

FS-4 Interface Circuit for R-4C

Tired of connecting the FS-4 synthesizer's injection cable each time you need general coverage and then disconnecting it when you are through? Leaving cable connected

reduces L.O. drive. Automatic relay switching kit controlled by FS-4 power switch provides the answer. Injection switch kit: \$49.00.

500 Hz 8-POLE CW FILTER FOR DRAKE TR-4, TR-4C, TR-4Cw

Improve the CW reception capabilities of your Drake TR-4, TR-4C, or TR-4Cw with new CT-500/8 crystal filter.

Easily installed in approximately three hours in any TR-4 with serial number 26,000 or higher. Ten-minute installation in TR-4Cw!

Select either 500 Hz or 2.1 kHz (phone)

bandwidths, depending on receiving conditions. New custom-made front-panel switch

The CT-500/8 is a direct replacement for the less-selective 500-Hz TR-4Cw 6-pole filter.

Compare the TR-4Cw filter to the CT-500/8:

| | TR-4Cw | CT-500/8 |
|------------|---------|----------|
| BW -6 dB: | 500 Hz | 500 Hz |
| BW -60 dB: | 2000 Hz | 1200 Hz |
| Poles: | 6 | 8 |

exists for both 800, 150, and 300 kHz CW. Existing indicator lights tell which filter is in use.

Upgrade your rig today with the CT-500/8 for only \$120.00. The three-position switch and filter mounting bracket sell for \$19.00.

(The conversion switch kit is not needed with TR-4Cw.)

Please add \$5.00 shipping-handling per order. Overseas air \$10.00.

Contact Cleaner for Switches and Pots

We stock Cramolin R-5 spray from Caig Labs. This is a perfect solution for

intermittant switch contacts and scratchy pots. 1 can: \$14.95, 3 cans: \$11.95 each.

Extra SSB / CW or AM Filter Switching for Drake R-4C

Fourth SSB / CW filter switch kit for R-4C: \$69.00

Two-AM filter switch kit for R-4C: \$69.00.

R-4C T-7C Update Modification

In later-vintage receivers, noise bandwidth of the third mixer V-4 is reduced by switching to a high-Q tap on T-7C when mode switch is in CW 0.5 or 0.25. This adjustment is quite sharp, and can be checked in either narrow CW position.

When Drake first started using the new T-7C transformer, several dB of loss occurred in the two narrowest CW

positions. This problem was later eliminated by replacing with RG-174/U the high-capacitance white-jacketed, color-coded audio cable from T-7C to the mode switch. C-49 (390 pF) was then increased to 430 pF.

C-49 can be replaced, or an additional 39 pF can be soldered across the two T-7C terminals nearest its PC board.

| Device Under Test | Noise Floor | AGC | | 100 kHz | | Sensitivity | LO Noise/Space | Front End Selectivity | Filter Ultimate | Dynamic Range | | | |
|-------------------------|-------------|-------------|------|----------|--------------|-------------|----------------|-----------------------|-----------------|---------------|---------------|----------------|---------------|
| | | Threshold | | Blocking | | | | | | Wide Spaced | Narrow Spaced | | |
| Drake R-4C/CF-600/6 | -139 dBm | 0.7 μ V | 3 dB | 130 dB | 0.15 μ V | 135 dBc | 10 kHz | A- Preselector | 130 dB | 85 dB | 20 kHz | 85 dB | 2 kHz |
| Atlas 350-XL | -131 | 1.0 | 11 | 117 | 0.2 | 125 | 4 | C Band Pass | 95 | 81 | 20 | 81 | 2 |
| Kenwood TS-830/YK88-129 | -129 | 1.5 | 3 | 122 | 0.1 | 114 | 2 | C Preselector | 85 \emptyset | 84 | 20 | 81 | 2 |
| Yaesu 901-DM | -135 | 1.6 | 3 | 124 | 0.15 | 109 | 2 | C Preselector | 85 | 87 | 20 | 80 \emptyset | 2.5 |
| Collins R-390A | -137 | N.A. | | 130 | 0.2 | 130 | 2 | A+ Trk Presel | 85 | 81 | 20 | 79 | 2 |
| Ten-Tec Corsair | -131# | 0.1 | 14 | 130 | 0.2 | 132 | 5 | C Band Pass | 90 | 93 | 20 | 79 | 2.5 |
| Icom IC-720A | -137 | 1.6 | 3 | 138 | 0.15 | 117 | 10 | C 0.5 Octave | 80 | 93 | 50 | 78 | 3 |
| Kenwood TS-820S | -137 | 0.4 | 3 | 115 | 0.2 | 125 | 10 | C Preselector | 80 | 79 | 20 | 78 | 3 |
| JRC NRD-515 | -138 | 3.5 | 4 | 103 | 0.1 | 118 | 10 | C 0.8 Octave | 80 | 95 | 20 | 77 \emptyset | 2 |
| Ten-Tec Omni V | -134 | 1.2 | 6 | 135 | 0.18 | 134 | 10 | C Band Pass | 100 | 89 | 20 | 76 | 2 |
| Atlas 210/215X | -120# | N.A. | | 123 | 0.5 | N.A. | | C Band Pass | 95 | 76 | 20 | 76 | 2 |
| Drake R-7 | -135/-140* | 0.4* | 3 | 145 | 0.28/0.15* | 114 | 10 | B 0.5 Octave | 85 | 97 | 100 | 75 | 2 |
| Drake TR-7 | -134 | 1.3 | 3 | 146 | 0.5 | 116 | 10 | B 0.5 Octave | 90 | 99 | 100 | 75 | 2 |
| Heath SB-104 | -123 | N.A. | | 92 | 0.5 | N.A. | | C Band Pass | 75 | 79 | 20 | 75 | 4 |
| Ten-Tec Omni-B | -136 | 0.2 | 25 | 129 | 0.15 | 130 | 10 | C Preselector | 80 | 87 | 20 | 74 | 2 |
| Icom IC-730 | -140 | 1.5 | 3 | 135 | 0.1 | 118 | 10 | C 0.5 Octave | 80 | 92 | 50 | 74 | 3 |
| Kenwood R-820S | -125 | 4.0 | 3 | 125 | 0.35 | 123 | 10 | C Preselector | 75 | 74 | 20 | 74 | 4 |
| Collins 75-S3B | -146 | 1.1 | 15 | 122 | 0.1 | 120 | 4 | B+ Preselector | 85 | 88 | 20 | 74 | 2 |
| Icom IC-781 | -127/-138* | 2.0/0.5* | 3 | 141 | 0.5/0.18* | 129 | 10 | B 0.5 Octave | 90 \emptyset | 94 | 20 | 73 | 2 |
| Kenwood TS-930S | -135 | 2.0 | 3 | 143 | 0.15 | 115 | 10 | B- 0.5 Octave | 80 \emptyset | 86 | 20 | 73 | 3 |
| Icom IC-701 | -129 | 5.5 | 6 | 130 | 0.3 | 125 | 10 | C Band Pass | 75 | 81 | 50 | 73 | 4 |
| JRC NRD-525 | -123# | 0.9 | 3 | 123 | 0.2 | 120 | 10 | C Trk Presel | 65 | 95 | 50 | 72 | 5 |
| Kenwood TS-830S | -136# | 0.9 | 3 | 122 | 0.1 | 113 | 2 | C Preselector | 80 | 84 | 20 | 70 | 3 |
| Icom IC-761 | -131/-139* | 2.0/0.7* | 3 | 145 | 0.4/0.17* | 129 | 10 | B- 0.5 Octave | 90 \emptyset | 87 | 20 | 70 | 2 |
| Kenwood TS-430S | -136# | 0.6 | 3 | 134 | 0.1 | 102 | 10 | C 0.5 Octave | 70 | 78 | 20 | 69 | 5 |
| Signal/One CX-11A | -122# | 0.6 | 17 | 109 | 0.6 | 119 | 50 | C 0.5 Octave | 105 | 90 | 50 | 68 | 5 \emptyset |
| Kenwood TS-180S | -139 | 0.9 | 3 | 115 | 0.15 | 120 | 10 | C Preselector | 80 | 70 | 20 | 68 | 3 |
| Drake TR-4C | -124# | 1.2 | 3 | 105 | 0.4 | 130 | 10 | C Preselector | 80 | 74 | 20 | 68 | 2 |
| Icom IC-735 | -126/-133* | 1.5 | 12 | 135 | 0.35/0.18* | 123 | 10 | C 0.5 Octave | 90 \emptyset | 83 | 20 | 68 | 2 |

| | | | | | | | | | | | | | |
|--------------------|------------|----------|----|-----|-----------|------|----|----------------|------|----|----|------|-----|
| Kenwood R-5000 | -131# | 0.4 | 3 | 134 | 0.2 | 120 | 10 | C 0.5 Octave | 80 ∅ | 86 | 20 | 65 | 5 |
| Yaesu FRG-7700 | -130# | 1.3 | 3 | 123 | 0.2 | 100 | 10 | D Octave | 65 | 83 | 50 | 64 ∅ | 5 † |
| Kenwood R-1000 | -130# | 0.9 | 3 | 119 | 0.2 | 107 | 10 | D Octave | 70 | 76 | 20 | 64 ∅ | 3 † |
| Heath SB-303 | -134 | N.A. | | 104 | 0.5 | N.A. | | C Preselector | 70 | 66 | 20 | 64 | 4 |
| Collins KWM-380 | -127# | 1.1 | 5 | 123 | 0.3 | 99 | 10 | B 0.5 Octave | 70 ∅ | 94 | 50 | 64 ∅ | 2 |
| Icom IC-751 | -127/-133* | 6.3 | 3 | 138 | 0.4/0.2* | 127 | 10 | B- 0.5 Octave | 90 ∅ | 84 | 20 | 64 | 2 |
| Kenwood TS-520 | -139 | N.A. | | 116 | 0.15 | N.A. | | C Preselector | 70 | 63 | 20 | 63 | 3 |
| Yaesu FT-One | -135 | 1.0 | 3 | 130 | 0.2 | 99 | 10 | C 0.5 Octave | 80 ∅ | 91 | 50 | 63 ∅ | 2 |
| Collins 75-S3 Wing | -145 | 1.0 | 14 | 105 | 0.1 | N.A. | | B Preselector | 75 | 75 | 20 | 63 | 3 |
| JRC NRD-93 | -141 | 1.6 | 3 | 128 | 0.15 | 133 | 10 | A+ Trk Presel | 80 | 94 | 20 | 63 | 2 |
| Yaesu FT-980 | -136 | 1.8 | 3 | 140 | 0.12 | 106 | 10 | C 0.5 Octave | 62 ∅ | 96 | 50 | 63 | 2 |
| Icom IC-R70/R-71A | -129/-135* | 3.1/1.4* | 3 | 132 | 0.4/0.2* | 128 | 10 | B- 0.5 Octave | 90 ∅ | 86 | 20 | 62 | 2.5 |
| Yaesu FT-101E | -141 | N.A. | | 102 | 0.15 | N.A. | | C Preselector | 70 | 60 | 20 | 59 | 3 |
| Drake R-4C Stock | -139 | 0.7 | 3 | 133 | 0.15 | 130 | 10 | A- Preselector | 70 | 85 | 20 | 58 | 2 |
| Yaesu FT-757 | -120/-134* | 1.6 | 3 | 130 | 0.7/0.15* | 109 | 10 | C 0.5 Octave | 70 ∅ | 86 | 20 | 56 | 3 |
| Kenwood R-2000 | -130# | 1.4 | 3 | 115 | 0.15 | 105 | 10 | D Octave | 70 | 71 | 20 | 45 | 5 |
| Kenwood R-600 | -130# | 0.8 | 3 | 109 | 0.2 | 99 | 10 | D Octave | 65 | 68 | 20 | F.L. | 5 |
| Yaesu FRG-8800 | -132 | 0.6 | 3 | 122 | 0.18 | N.A. | | D Octave | 70 | 87 | 20 | F.L. | 5 |

Notes: Some data is the average of two or more sets.

One dB blocking (gain compression) test done at 100 kHz to eliminate phase-noise interaction.

N.A. = Data not available.

= Measured with SSB filter.

* = Built-in preamp actuated.

∅ = Measurement was phase-noise limited.

† = Readings would have been lower if 2-kHz spacing had been possible.

F.L. = Filter limited, no measurement was possible.

Receiver Modification Service

Sherwood is now offering installation of our electrical and filter modifications. Advance authorization requested for scheduling.

AMP-4 audio amplifier, PD-4 product detector, and power supply update installations in R-4C: \$125.00.

SSB switch kit installation for CF-2K/8 pair in R-4C: \$50.00.

CF-600/6 relay kit installation R-4C: \$50.00.

Four-filter switch kit for CF-2K/8, CF-600/6 and 8-kHz filter in R-4C: \$150.00.

Custom front-panel switch installation: \$50.00.

MIX-4 third mixer installation in R-4C: \$35.00

AF/RF knob set installation \$5.00.

PD-4 Detector in SPR-4: \$50.00.

R-4C/FS-4 interface kit installation: \$35.00

Full alignment of Drake receivers: \$75.00. Needed parts extra.

JRC NRD-515 and NRD-525 modifications: See separate page on Japan Radio products.

Add \$15.00 UPS return shipping receivers.

R-4C PTO Output Circuit Changes

R-4Cs starting about serial number 25,000 had their PTO output pi-network capacitor, C119, changed from 390 pF to 620 pF. In some sets, this change reduced first-mixer injection to the point that gain and sensitivity were significantly reduced.

When using the SSB filter, the preselector peak on 10 meters, with no antenna connected, was reduced to as low as 2 dB.

The preselector noise peak, as measured with a voltmeter connected to the anti-vox jack, should be at least 6 dB. Change C119, located on the front-panel end of the audio-amplifier board, back to a 390-pF mica if a poor peak exists in your set after normal alignment procedures have been followed. Do not change if peak is already adequate. All sets do not need this modification.

Adapting R-4C Filters to R-4, R-4A, R-4B

R-4C first i-f filters can be adapted to earlier R-4 series receivers. Existing T5 and T6 transformers must be removed and replaced with new R-4C units. Then any two R-4C

filters may be installed on the preselector bracket. Recommended filter combination: CF-5K/8 + CF-600/6, or CF-2K/8 pair. One relay switch kit is required at \$75.00.

R-4, R-4A, R-4B, & SPR-4 Electrical Modifications

(Refer to following page)

R-4 and R-4A: add -70 volt RC filter to existing power-supply circuit.

R-4B: add IC detector and -70 volt RC filter.

SPR-4: add IC detector and PS-4 12-volt power supply improvement.

R-4C Audio Amplifier

Improvements in the Drake R-4C receiver, up to now, have been mainly confined to the i-f system. One area that needs improvement is its audio strip, which suffers from buzz and higher-than-desirable distortion. It also dissipates 7 to 10 watts of heat near the

PTO. The AMP-4 replacement audio amplifier eliminates these problems. While intended as an R-4C retrofit, this circuit performs so well that we recommend it for other communications uses. (Overall gain is 40 dB.)

AMP-4 wired PC board amplifier: \$49.00.

Solid State 3rd Mixer!

Having problems with noisy 6EJ7 tubes in the R-4C third mixer? Introducing MIX-4 solid-state third-mixer kit. Eliminates frying, crackling, and microphonics. This PC board replaces the high-gain tube mixer stage with an FET amplifier followed by an FET mixer.

Also cures power-line and R-4C power-supply-induced buzz that couples into the 6EJ7 grid.

Mounts on top of existing FL-2400 filter.

MIX-4 wired PC board replacement third mixer: \$59.00.

R-4C Product Detector

The product detector in the R-4B / C has serious dynamic headroom problems. Under transient conditions (AGC attack), the i-f signal level can actually exceed the BFO input level, repeatedly rendering the detection very distorted for a fraction of a

second. The PD-4 IC product detector eliminates this deficiency, plus reduces detected audio that gets back into the AGC detector.

PD-4 wired PC board detector: \$35.00.

R-4C Power Supply Improvements

The 14-volt power supply in the R-4C is inefficient in two ways: it provides mediocre filtering and, along with the original audio amplifier, produces 15 watts of extra heat. The availability of three-terminal monolithic regulators makes

these the obvious choice for upgrading the R-4C low-voltage supply.

An update kit of parts for the low-voltage line, added filtering for the -70 and +150 volt lines, and added 150-volt rectifier-buzz suppression is available as the PS-4.

Shipping for above electrical mods: \$5.00 per order. Overseas airmail: \$15.00.

Front-End "Antenna" Filters

When the ultimate in front-end receiver protection is needed, upgrade your station with the Sherwood FE-series filters.

A must for low-band multi-op contest and DX operators.

Shortwave broadcast protection - Europe, Asia, Urban "Kilowatt Alleys"

Can be used with any brand receiver. Adaptable to transceivers, too.

Low-loss 6-pole 50-ohm designs. Shape factor: 2.5:1 6/60 dB.

Units available for the lower 100 kHz of 40, lower 12.5 kHz of 80 meters, and select 5 kHz segments on 160 meters.

All FE-Series filters may be tandemed with 2-dB pad for higher performance.

Segments available:

- FE-7000/6 FE-7025/6
- FE-7050/6 FE-7075/6
- FE-3500/6 FE-1800/6
- FE-1805/6 FE-1825/6
- Filter part number designates low-frequency edge of "window".

40, 80, and 160-meter filters: \$119.00.

\$5.00 shipping, \$10.00 overseas air.

Signal/One SSB Filters

Sherwood filter and processor technology has been applied to the CX-11A, and CX-7A to improve these fine transceivers. The new filter set eliminates the common 3- to 6-dB passband-ripple problem, which reduces talkpower and intelligibility. A true 16-pole 2.2-kHz filter is installed in the first filter position, and a wider 8-pole

post-clipping filter replaces the stock second unit.

CS-2.2K/16 first filter is \$450.00.

CS-2.7K/8 second filter is \$150.00.

See 11-SP RF speech processor on Drake 7-SP processor page.

2200 & 2700 Hz 8-Pole SSB Filters for Atlas

Upgrade or repair your rig with our 2200- or 2700-Hz 8-pole crystal filters.

Wider bandwidth identical to original 2700-Hz Atlas filter.

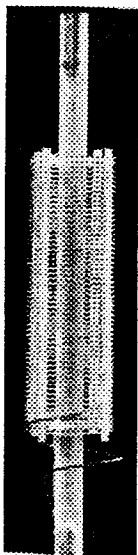
Narrower 2200-Hz all-purpose bandwidth is ideal for today's QRM: rag chewing, DX, or mobile.

Easily installed on IF PC board in place of original filter.

CA-2.2K/8: \$80.00, CA-2.7K/8: \$60.00, for 210/215X with 5645 kHz i-f.

CAS-2.2K/8 for 5520 kHz i-f: \$119.00.

SE Series No-Compromise HF-Mobile Antenna Systems



The world of miniaturization has brought us compact HF rigs and tiny mobile antennas. Small rigs have resurrected the interest in mobile, but until now the antennas more resembled narrow-band dummy loads than high-efficiency radiators!

One of the world-class mobile DXers, John Beale, KDØU, came to Sherwood with one request: Build a high efficiency 40-meter mobile antenna that would handle the full legal power limit. With 20 years of in-house mobile antenna experience to draw on, Sherwood developed the SE-40 antenna system.

The System:

One five-foot custom-made stainless whip, and a large ultra-high Q coil and insulator assembly. Optional extra-high-strength masts and capacity hat available, see below.

Advantages:

5-dB signal increase. 50-ohm resistive match at resonance, a must for today's solid-state rigs. Can be tapped for 20 and 15 meters.

Disadvantage: It's large!

SE-75 pictured above

Capacity Hat

Matching:

Requires a 470 pF capacitor be clipped across the feed point on 40 meters and 1200 pf on 75 meters. When used with 36-inch base section, 100 pF recommended on 20 meters for a perfect match.

Dimensions:

- SE-40 12 inches by 3 inches.
- SE-75 18 inches by 3 inches.
- SE-160 18 inches by 6 inches.

SE-40, (40 - 10 M) \$99.00.

SE-75, (75 - 15 M) \$119.00.

SE-160, (160 - 15 M) \$349.00.

Two-piece dual-diameter 3/8- and 3/4-inch stainless steel six-foot mast: \$79.00.

3/8-inch diameter stainless steel masts:

3 feet: \$39.00, 4 feet: \$49.00.

Two-foot diameter stainless-steel capacity hat, required with SE-75. Also increases 40-meter bandwidth by 50% and 40-meter signal by an additional 1 dB. \$49.00. Three-foot capacity hat required with SE-160: \$75.00.

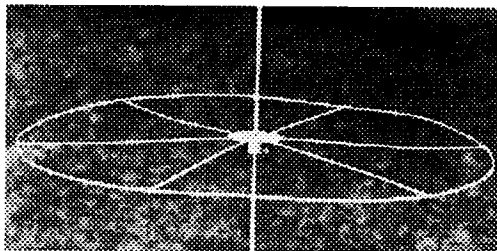
Two-inch brass high-strength base mount: \$69.00. Requires user-supplied bumper bracket. Call for details.

Shipping / handling charges:

SE-40, SE-75, & SE-160: \$15.00.

Mobile mast: \$20.00, capacity hat: \$10.00.

Overseas: contact us for shipping quote.



SE-3 High-Fidelity Phase-Locked AM Product Detector

Eliminates Selective-Fade Distortion and Garbling

Able to Receive One Sideband at a Time to Minimize Interference

Introducing a whole new world of shortwave and broadcast reception with the time-proven Sherwood SE-3 phase-locked AM product detector. Even with the evolution of modern-day communications receivers, with their improved stability, selectivity, and dynamic range, AM reception under fading signal conditions has remained a compromise. With a diode or synchro-phase detector, severe distortion occurs every time the carrier drops out in a selective fade. Carrier nulls (fades) of 20 to 30 dB or more are common, which result in total loss of intelligibility. Under these conditions, the desired signal has become a double-sideband reduced-carrier transmission which cannot be detected in the normal manner.

Exalted-carrier selectable-sideband (ECSS) reception can be used to combat the fading problem. Distortion is not present, (assuming a properly operating receiver/detector), but a beating problem occurs because you cannot keep the receiver right on frequency. In effect, one type of distortion is traded for another. (Even a synthesized receiver, tunable in 1 Hz steps, would be mistuned a fraction of a Hertz, resulting in a swishing sound every few seconds.) While tuning errors of some tens of Hertz may be tolerated during voice reception, music sounds more unpleasant because the harmonic relationship so critical to musical overtones is destroyed.

The only complete solution to the problem is phase-locked detection with a product

detector. The BFO in the SE-3 is locked to the transmitted signal's carrier, and then completely replaces it in the detection process. Thus demodulation is fully independent of the signal's carrier strength at any given moment. A selective null can roll through the signal, changing the tonal balance of the audio, but proper detection will still take place.

The SE-3 is a self-contained buffer, detector, and audio amplifier system. All that is needed is an i-f output (from the receiver) and a speaker or headphones. The amplifier is rated at 5 watts, and is adequate for most installations. If, however, a low-efficiency acoustic-suspension speaker is preferred for music reproduction, an auxiliary output is provided for an external amplifier. Tape recordings can also be made from this output, if desired. The headphone jack will accommodate either mono or stereo phones without the need for an adapter.

The SE-3 has three main front-panel controls: BFO offset, BFO vernier, and audio gain/power on-off. Nine BFO offsets are available: carrier centered in i-f filter, plus lower and upper sideband for each filter, up to four. (The required offsets are tailored to each individual receiver's needs.) The vernier is provided for tuning between 100-Hz lock points on synthesized receivers, and as an aid in zero-beating, to center the station within the SE-3's lock-in range. A lock/unlock switch is also provided for SSB/RTTY/CW reception.



The following features are included in each SE-3:

- Audio notch (whistle filter) for 5kHz is optimized for shortwave channel spacing. W-1 (5 kHz) is standard. Replace W-1 with optional W-2 (9 kHz), or W-3 (10 kHz) whistle filter for standard broadcast, add \$15.00.
- Synchro-phase (envelope) detector (D-1) for conventional operation or rapid scanning. Allows SE-3 output to be used at all times.
- High-frequency roll-off tone control, T-1. Three positions: flat, medium, and full roll-off.
- High-frequency boost, T-2. Increases high-end response to compensate for poor-quality program material or to correct for speaker roll-off. Three positions: flat, 3 dB or 6 dB boost at 5 kHz. Different boost frequency: add \$10.00.
- Buffered auxiliary output for recording or driving other accessories.

SE-3: \$399.00.

A transformer, with cable and mating connector, is required for SE-3 operation. Must supply 20 V. AC at 1/2 amp. P-1 transformer, 120 V. primary, wall-mounted: \$25.00.

R-4C passband tuning interface for BFO input. Replaces D-1 detector: add \$10.00.

Please specify receiver model plus filter bandwidths in receiver.

System bandwidth is determined by receiver i-f bandwidth:

6-kHz filter would give response to 6 kHz when run in LSB or USB offset position.

SE-3 response: 30 Hz to 15 kHz at -3 dB.

IF level requirement: 30 mV. to 2 V. RMS.

Speaker impedance: 4 ohms or greater.

Auxiliary output: 300 mV RMS.

User must supply male - male phono cable to connect radio to SE-3, plus separate speaker or headphones. Radio Shack Minimus-7 and Minimus-77 speakers are recommended for use with SE-3.

Shipping UPS \$10.00; Overseas airmail, \$35.00. Overseas insurance \$10.00.

SE-4 with TCXO recommended for Drake R-7 (A). See following page.

SE-4 Digital Stabilizer



SE-4 VFO/PTO digital stabilizer. Drift has been a problem since the first oscillator was invented. Temperatures rise, parts expand, and moisture evaporates. All can cause your analog VFO or PTO to drift for hours or days.

Solution: Buy a rig with a synthesized VFO? Maybe, but digital rigs usually have troublesome noise, reducing useful dynamic range.

Alternative: Digitally correct for drift and stay on frequency with the Sherwood SE-4 Mk II.

This source-locking counter technique has now been applied by Sherwood Engineering to Amateur and SWL requirements. Lock points less than 20 Hz apart, yet self-defeats for normal tuning. Reasonable compensation range (plus or

minus 1 kHz), but automatically recenters itself should range be exceeded.

Residual drift solely determined by receiver crystal(s) and stabilizer timebase. High-stability TCXO (temperature compensated crystal oscillator) for Drake R-7(A) available as an option.

Interfaces to receiver incremental tuning (RIT), or optional Varicap diode board if needed. Does not degrade receiver LO (local oscillator) noise specs since loop bandwidth much less than 1 Hz.

Low power dissipation, using C-MOS circuitry, requires only 10 to 15 volts DC from receiver power supply.

Model SE-4: \$149.00. 40 MHz TCXO option for Drake R-7(A): Add \$50.00.

Varicap interface board: \$25.00.

Japan Radio NRD-515

A modification is necessary to use a 515 with the Sherwood SE-3 phase-locked detector. The internal AM detector causes intermodulation distortion (IMD) of the i-f signal. This distortion is accurately (and annoyingly) reproduced by the wide-band SE-3. An FET buffer is installed in the 515 to isolate its detector from the i-f, eliminating the problem. Field-installable printed circuit board amplifier: \$20.00. Installation of PC board: \$20.00.

The 515's versatility is limited by its modest selection of AM bandwidths. We offer custom accessory-filter PC boards to solve this problem. With our two-filter board, a 15-pole 8-kHz filter can be added to greatly improve the muffled audio that occurs with the standard AM filter. This board will accommodate two 15-pole filters or one 15-pole and one crystal filter.

15-pole filter mounted on board: \$99.00. Other bandwidths available, such as 14 kHz, 6 kHz, and 4.5 kHz. Second filter: \$79.00.

Optimization of the Sherwood filters, plus a

vast improvement in performance of the existing AM filter can be realized with circuit changes on the main receiver board. A 30-dB increase in ultimate rejection of the standard filter is typical. Circuit modifications: \$39.00.

Alignment of the receiver's AGC and digital circuitry: \$20.00.

For those who need more than two accessory filters, step up to the 4-filter switching board. This plug-in board allows six filters to be selected from the front panel. Relay board: \$195.00. Filters extra. Installation: \$50.00.

Future products to be available:

Please feel free to contact us to discuss selection of filter bandwidths best suited to your needs and interests.

NOTE: For an additional \$15.00, our lab will provide you with a hard-copy 90-dB filter plot of your modified radio. See the actual bandwidth and rejection characteristics of your JRC/Sherwood NRD-515.

Authorized Dealer Japan Radio NRD-525

A modification is necessary to use the NRD-525 with the Sherwood SE-3 phase-locked detector. An i-f output must be added to the set to feed our unit. A 9-volt 30-mA output on rear of the set is rewired to provide i-f output. No hole drilling is required, and i-f board can still be unplugged as before. This change can be done in the field, or in our shop for \$39.00.

We recommend the addition of our 15-pole CN-8000 8-kHz filter with shape factor of 1.3:1. Other choices include 14-, 6-, and 4.5 kHz units. Our 15-pole filters can replace the existing AM filter. We can also install JRC 1.8-kHz or 1.0-KHz filters, though their CW filter is not recommended due to poor shape factor. The Sherwood CN-400 is suggested

for CW and narrow-shift RTTY reception. CN-14000, CN-8000, CN-6000, and CN-4500 are \$79.00 each. CN-400 CW filter is \$179.00. Installation \$20.00 per filter.

Optimization of Sherwood filters, plus an improvement in performance of existing AM and SSB filters can be realized with circuit changes to the i-f filter board. A 15 dB improvement in existing filter ultimate rejection is typical. Circuit modifications: \$39.00.

Alignment of receiver circuitry is \$20.00.

NOTE: For an additional \$15.00, our lab will provide you with a hard-copy 90-dB filter plot of your modified radio. See the actual bandwidth and rejection characteristics of your JRC/Sherwood NRD-525.

CHERRIES

County Hunters Entry Recording Reporting Interactive Executive System.

Especially designed by county hunters for the IBM - PC & AT and compatibles.

This is the ultimate logging program for the serious county hunting amateur. Memory resident recognition (artificial intelligence) swiftly assists the entry of calls, states, and counties. You are assured of correct spelling on even the most difficult names. Printed output includes Logs, MRCs (Mobile Reply Cards), front and back, Record Books, want lists, and more. Serialized MRCs make confirmation especially easy. Totally menu driven. On-line help is available at every prompt. Published file specifications and log dumps facilitate data transfer to other programs for specialized reporting. Over 300 currently

active county hunters are in the call verify database. Automatic tracking and reporting of YL and BINGO counties too! All state and county files are ready to go. The user may add or delete calls, states or counties at any time. As this is a logging system - not just a county database - you may log and track as many contacts per county as you wish. Requires at least 512K of memory. A hard disk is highly recommended.

Hard-disk upgrades available. Call for quote.

Cherries: \$69.00. Shipping \$5.00.
Overseas airmail \$10.00.

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