CDR-3280 LF-HF HALF-RACK RECEIVER



The CDR-3280 LF-HF Receiver is a high performance computer-controlled 10 kHz to 30 MHz DSP Receiver

FEATURES

- 10 kHz to 30 MHz Tuning Range
- 1 Hz Tuning Resolution
- 3 ms Typical Synthesizer Tuning Speed
- Low Synthesizer Phase Noise
- 51 Standard Bandwidths

- 3 1/2" Half-rack size
- ISB, LSB, USB, CW, AM, FM and FSK Detection Modes
- Rugged construction using surface mount technology
- Quadrature Digital IF output (I & Q)
- Third Order Intercept Point of +30 dBm typical
- Continuous self-test, BITE and BIT
- Easy-to-read vacuum fluorescent display
- User-friendly menu-driven control



CDR-3280 LF-HF DSP RECEIVER SPECIFICATION

FREQUENCY

Tuning Range: 10 kHz to 30 MHz

Tuning resolution: 1 Hz

Synthesizer Tuning Speed (from receipt of last command byte until within 1 kHz of the final frequency): all

modulation modes

Df<100 kHz <1.0 mesc, typical Df<1 MHz <1.5 msec, typical Df<10 MHz <2.0 msec, typical

Receiver Tuning Time: 10 ms max.
Command Processing: 2 ms

Synthesizer Tuning Time: 2 ms IF Settling Time: 4 ms

AGC Attack Time (fast): 2 ms Applicable in all modes with IF bandwidth 2 kHz or greater

Tuning Accuracy:

Internal Standard (TCXO): 1 ppm of tuned frequency

External Standard: equal to accuracy of external standard in ppm

Internal External Erroquency Standard

Internal/External Frequency Standard: 10 MHz

DETECTION MODES

AM, FM - all bandwidths USB, LSB, CW - bandwidths <6 kHz ISB - 2.8 kHz bandwidth per sideband

SCAN AND SWEEP

Channels: 250 programmable channels

Scan: up to 250 channels

Sweep: f1 to f2 at selected steps. Up to 125 frequency bands programmable Sweep and Scan Rate: 1 to 100 per second

Adjustable Threshold: -112 to 0 dBm in 0.5 dB increments

RF SECTION

Input Impedance: 50 ohms Input VSWR: less than 3:1

Sensitivity for 10 dB SINAD (above

1.6 MHz):

AM (6 kHz BW): -105 dBm, 50%

modulation

CW (500 Hz BW): -122 dBm SSB (3 kHz BW): -113 dBm

FM (16 kHz BW): -98 dBm input, 5 kHz deviation, 400 Hz modulation:

20 dB SINAD Noise Figure: 15 dB RF Protection: 50 dB reflective attenuation. Activates at signal levels between +10 dBm and

+20 dBm. Protects from input signals of levels up to 10 watts

RF Filters: eight sub-octave bandpass preselector filters used from 1.6 to 30 MHz. Frequencies below 1.6 MHz are selected by two low pass filters. Filter selection is automatic with tuned frequency selection

AGC (fast attack selectable decay):

Attack time (SSB and CW modes): Fast: <2 msec for 50 dB change

(sweep and scan only)

Normal: <10 msec for 50 dB change Decay Times: selectable 20 ms to

4 seconds nominal for 50 dB change Dynamic Range: output level held within 1 dB over a 110 dB range

Threshold: set to -112 dBm

Dump: bus controllable, time <2 ms AM or FM: average detection with 50 ms response time for 50 dB change

MGC: bus controllable over 127.5 dB gain reduction in 0.5 dB nominal steps

IF SECTION

First IF: 40.456 MHz Second IF: 456 kHz Third IF: 24 kHz

Fourth IF (DSP): 51 standard bandwidths from 100 Hz to 16 kHz, bus

selectable

Shape Factor: 3 dB to 60 dB (better than 2:1, 400 Hz and above) Inband Ripple: 1 dB maximum

INTERFERENCE IMMUNITY

IF Rejection: 100 dB Image Rejection: 100 dB

Cross Modulation: unmodulated desired signal of -60 dBm together with a modulated (30% AM at 1 kHz) undesired signal of -10 dBm, spaced 100 kHz apart, will produce less than 10% cross modulation of the desired signal

Blocking: attenuation of a desired RF signal of -60 dBm caused by an unmodulated signal of +10 dBm spaced 100 kHz away is less than

3 dB

Synthesizer Phase Noise: -110 dBc/Hz

@ 1 kHz spacing, nominal

Oscillator Reradiation (up to 1 GHz):

-110 dBm

Spurious Responses: -120 dBm equivalent or less for -50 dBm input

Generated Spurious (above 0.14 MHz): two at no more than -110 dBm. All

others less than -120 dBm Intermodulation Distortion:

Third Order Intercept Point:

+30 dBm (typical)

Second Order Intercept

Point (typical):

1.6 MHz <f<30 MHz: +60 dBm 0.1 MHz <f<1.6 MHz: +45 dBm

OUTPUTS

WBIF: 456 kHz, 20 kHz min. BW
NBIF: 455 kHz with BW equal to
selected receiver BW. Level -10 dBm
±3 dB over AGC dynamic range
Third IF: Digital I&Q, 24 ks/s
Video: demodulated FM, 2V peak to

Video: demodulated FM, 2V peak-topeak into 75 ohm (deviation equal to 30% of selected bandwidth)

Audio Line Output:

AM, CW, LSB, USB: $0 \text{ dBm} \pm 3 \text{ dB}$ ISB (simultaneous LSB and USB

outputs): 0 dBm ±3 dB

FM: 0.5 V/kHz AC coupled (4V peak-to-peak maximum) 600 ohms balanced pair, short circuit protected, less than 3% distortion at rated output

Headphones: 0 to 5V, peak-to-peak, 8 ohm load impedance to front panel phone jack. Short circuit protected Speaker: 0 to 10V peak-to-peak, 8 ohm load impedance to rear panel

for external speaker

REMOTE CONTROL

RS232, RS422 and IEEE488 available. All receiver operational parameters are remotely controllable

BITE

Probability of Detection: 90%. Entire receive chain is tested. In addition, fault detectors continuously monitor voltage levels and phase lock

CDR-3280 LF-HF DSP RECEIVER SPECIFICATION

RELIABILITY

MTBF: 9,000 hours. Calculated based on "Naval Sheltered" (NS) as defined in MIL-HDBK-217F

MAINTAINABILITY

Mean-Time-to-Repair (MTTR) of not more than 30 minutes at the module replacement level.

POWER REQUIREMENTS

90 - 260 VAC, 47 - 440 Hz, 50 watts

CONTROLS & CONNECTORS

Front Panel:

Full alphanumeric display with full function keypad for entry of all parameters

Control knob for selection of all parameters

Volume ON/OFF knob

1/4 inch phone jack for headset

Rear Panel:

Power Connector: IEC320

Ref Input: BNC
Ref Output: BNC
Antenna Input: BNC
WBIF Output: BNC
NBIF Output: BNC
Digital Data: 15-pin Sub D
Audio: 15-pin Sub D

Bus Control:

RS-232/RS-422: 25-pin Sub D IEEE-488: stacking 24-pin

ENVIRONMENTAL DATA

Operating High Temperature: MIL-STD-810E, Method 501.3, Procedure II, Table 501.3-I (ambient air conditions), maximum test temperature 50°C, one cycle

Operating Low Temperature: MIL-STD-810E, Method 502.3, Procedure II, Temperature 0°C Storage High Temperature:

MIL-STD-810E, Method 501.3, Procedure I, 85°C, one cycle

Storage Low Temperature: MIL-STD-810E, Method 502.3, Procedure I, Temperature -40°C for 12 hours

Humidity: MIL-STD-810E, Method 507.3, Procedure I-Natural, Table 507.3-I, five cycles total

Shock: MIL-STD-810E, Method

516.4, Procedure VI

Vibration: MIL-STD-810E, Method 514.4, Procedure I, Category 9, Figure 514.4-15

DESIGN AND CONSTRUCTION

MIL-STD-2036, Paragraph 5.1.4 as a guideline. Workmanship: MIL-HBK-454, Requirement 9 as a guideline

DIMENSIONS AND WEIGHT

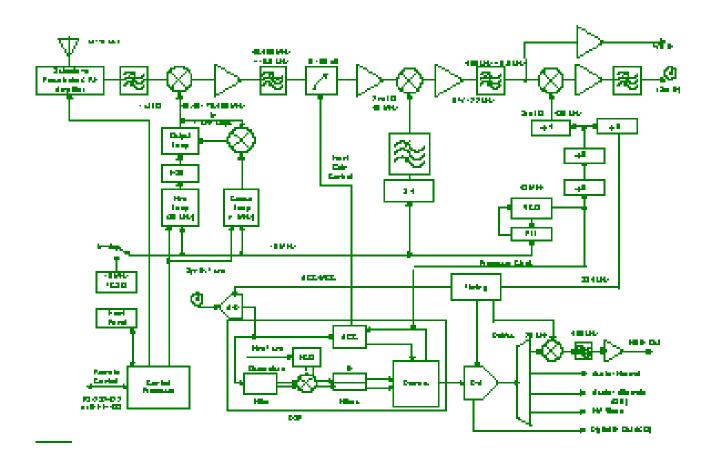
Size: Half 19-inch rack, 8.45 inches (21.5 cm) wide 3.5 inches (8.9 cm) high 22.25 inches (56.5 cm) deep Weight: 16 lbs (7.25 kg)

Front Panel and Chassis Cover:

FINISH

FED-STD-595, chip 26307, semigloss grey enamel Chassis: corrosion protected following guidelines established in MIL-HBK-454, Requirement 15 Handles and Silkscreen Markings: matte black

CDR-3280 LF-HF DSP RECEIVER SPECIFICATION



This LF through HF receiver is a triple-conversion superheterodyne design in which the final IF filtering and demodulation are accomplished with digital signal processing (DSP) for superior accuracy and flexibility. The three intermediate frequencies (IF's) are 40.456 MHz, 456 kHz and 24 kHz. Having the first IF above the entire tuning range assures spurious-free reception. At the third IF, the signal is converted to digital form. A digital signal processor chip then provides fine tuningm IF filtering to the selected bandwidth, and AM, FM or product detection according to the operating mode. Fifty-one bandwidths are offered from 100 Hz to 16 kHz. The demodulated signals are converted back to analog form for output to a speaker, headphones or balanced lines.

Ordering Information

Model Number	Part Number	Description
CDR-3280	260001-13	LF/HF Digital Receiver, one-half rack, 10 kHz - 30 MHz
CHAS-KIT-01	2600-1000-1	Full Rack chassis Kit, without rack slides
RKSLD-KIT-02	222-026/087	Rack Slides Kit (2RU)
VIRTCONT-01	2800-3001-1	HF Virtual Control Software (order with unit)
MNT-KIT-01	2600-1009-1	Dual Rack-mount Kit, Side-by-side

Specifications subject to change without prior notice

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