



SIR 3200-40B

VHF/UHF WIDEBAND DSP RECEIVER



FREQUENCY RANGE: 20 to 3000 MHz

FEATURES

- High Dynamic Range Allows the End User to Reject High Powered Adjacent Channel Signals Improving Signal Of Interest Selectivity
- Fast Tuning, “Real Time Stare” Bandwidth Up to 40 MHz Helps Identify Short or Burst Transmissions Such as Those Used as RF Triggers in Remote Detonations and Operational Signaling
- Ultra Low Colorization and Reciprocal Mixing
- Advanced Noise Riding Threshold (ANRT) for Improved Detection of Signals of Interest
- Improve Operational Flexibility While Reducing Maintenance and Repair Costs
- Supports Multiple VHF/UHF Legacy IF Bandwidths and Center Frequencies
- Modular Architecture Provides for Lower Total Cost of Ownership
- Sweep and Scan Capability

RF PERFORMANCE HIGHLIGHTS

- 140 MHz Analog IF Center Frequency with 40 MHz Bandwidth
- 10.7 MHz / 21.4 MHz / 70 MHz Reconstructed IF Center Frequencies with 3.2 KHz to 40 MHz Bandwidths
- Seamless Tuning From 20 to 3000 MHz
- In Band Input IP3 (10 dBm Typical)
- Out of Band IP3 (25 dBm Typical)
- Low Phase Noise RF Chain, Less Than 0.5 Degree Integration (0.2 Degree Optional)
- Less Than -110 dBm Internally Generated Spurious



FRONT PANEL OPERATOR INTERFACE

- Color Spectral Display (LCD) with Front Panel Control
- Multimode Panoramic and IF Spectral Display with up to 40 MHz BW
- Ability to edit Sweep and Scan mode from the front panel
- Configuration Restores automatically after off / on iteration
- Temperature Monitoring and automatic shut down
- Interactive Main and Temporary Frequency List Mode editing from the front panel

REMOTE INTERFACE

- I/Q and VoIP over Ethernet Remote Output (50 KSPS)
- Ethernet . RS 232, RS 422, RS 485 Remote Control

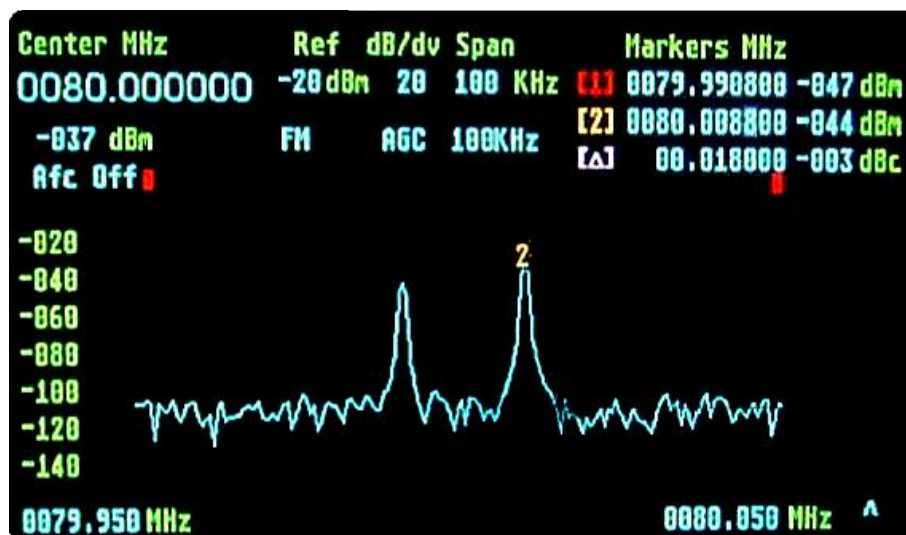
IF DIGITIZER

- 10 dBFS (dB Full Scale) Spurious Free Dynamic Range utilizing 16 BIT ADC
- 40 MHz Signal Processing Bandwidth

SDR SOFTWARE DEFINED RADIO

- Low Power FPGA Implementation
- IF Filtering From 10 KHz Up to 40 MHz
- AM, FM, LOG, CW, ISB Demodulation
- 90 dB Manual or Automatic Gain Control (MGC, AGC)
- Adaptive Noise Riding Threshold

TYPICAL DISPLAY





SPECIFICATIONS AT 25°C

FREQUENCY

| | |
|--|---|
| Frequency Range: | 20 to 3000 MHz |
| Tuning Resolution: | 10 Hz |
| Synthesizer Tuning Speed: | 200 usec max |
| Frequency Accuracy vs. Temperature (Internal Ref): | < +/- 0.1 PPM |
| Long Term Aging (Internal Ref): | < 1 ppm / 10 Years |
| External Reference Input: | 10 MHz at 0-6 dBm, Auto Locking |
| Phase Noise: | 0.5° RMS Integrated (100 Hz to 10 MHz) (0.2° RMS OPT 105) |
| Offset 100 Hz | -80 dBc/Hz Typical -75 dBc/Hz Max. |
| Offset 1 KHz | -99 dBc/Hz Typical -95 dBc/Hz Max. |
| Offset 10 KHz | -100 dBc/Hz Typical -95 dBc/Hz Max. |
| Offset 100 KHz | -110 dBc/Hz Typical -105 dBc/Hz Max. |
| Offset 1 MHz | -130 dBc/Hz Typical -125 dBc/Hz Max. |
| Offset 10 MHz | -150 dBc/Hz Typical -145 dBc Max. |

SCAN AND SWEEP

| | |
|-----------------------|--|
| Tuning Speed: | 2.5 msec (Typical) |
| Sweep Mode: | F1 to F2 at Selected Frequency Step |
| Scan Mode: | Up to 512 Channels |
| Dwell / Step Time: | From 1 to 60 Seconds, or Stop on Detection |
| Sweep Rate: | 1 GHz / millisecond (minimum) @ 400 Steps |
| Adjustable Threshold: | 1 dB Increment from -100 dBm to -10 dBm at IF output |

RF SECTION

| | |
|--------------------------------|---------------------------------------|
| Input VSWR: | 3.0 : 1 |
| RF Preselector: | 8 Bands |
| Noise Figure: | 15 dB max (13 dB Typical) |
| RF Input No Damage Level: | 20 dBm |
| RF Gain Variation: | +/- 2 dB vs. RF Input Frequency Range |
| IF Rejection: | 90 dB Minimum |
| Internally Generated Spurious: | < -110 dBm equivalent RF input |

DYNAMIC RANGE

| | |
|------------------------------|-------------------------------|
| Spurious Free Dynamic Range: | 70 dB @ 0 dBm IF output level |
| Image Rejection: | 80 dB |
| LO Re-Radiation: | < -95 dBm at RF Input |



| | |
|------------------------|--|
| Out of Band Input IP3: | +25 dBm typical, Two tones @-30 dBm, 10 MHz Spacing, placed outside the first IF BW |
| In Band Input IP3: | +10 dBm typical Two tones @-30 dBm, 100 KHz Spacing, placed inside the Analog IF Output |
| Output IP3: | +20 dBm On Reconstructed and 25 dBm on Analog IF |
| Input IP2: | 40 dBm minimum for tones placed outside the final analog IF filter |
| Reciprocal Mixing: | Input signal at rated sensitivity and 20 KHz IF Bandwidth. An out of band signal 350 KHz offset and 70 dB higher in level will not degrade the signal-to-noise by more than 5 dB |

ANALOG IF OUTPUT

| | |
|------------------------|-------------------------------------|
| Center Frequency: | 140 MHz IF with 40 MHz IF Bandwidth |
| RF to IF Gain: | 30 dB |
| RF to IF Gain Control: | 30 dB in 1 dB Steps |

RECONSTRUCTED IF OUTPUT

| | |
|-----------------------------------|--|
| Center Frequency / BW @ 3dB: | 10.7 MHz / 3.2,6.4,10,20,30,50,100,200,500 KHz,1 MHz, 2 MHz 21.4 MHz / All the above plus 5 MHz and 10 MHz 70 MHz / All the above plus 20 MHz and 40 MHz |
| Manual Gain Control (MGC): | Programmed 90 dB , 1 dB Resolution |
| Automatic Gain Control (AGC): | 90 dB Range, Fast Attack Programmed Decay |
| Attack Time: | 1 msec Typical |
| Decay Time: | Fast, Medium, Slow |
| IF Output Level: | Programmed from +5 dBm to -20 dBm, 1 dB Step |
| IF Output Impedance: | 50 ohm |
| Advanced Noise Riding Threshold** | (5-35 dB SNR) Levels |
| VSWR: | 2.0:1 Max |

LOG VIDEO OUTPUT

| | |
|-----------------|--------------------|
| Dynamic Range: | 60 dB |
| Output Level: | 2.0 VDC Full Scale |
| Linearity: | +/- 1.5 dB |
| Connector Type: | BNC, Female |
| Impedance: | 50 ohms |

FM VIDEO DEMODULATOR

| | |
|------------------------|---|
| Output Level: | 1 Vp-p for 2/3 of selectable IF Bandwidth |
| Video Response (3 dB): | 40% of IF Bandwidth |
| FM Gain: | Adjustable from 10% to 100% |
| Connector Type: | BNC |
| Impedance: | 50 ohms |



AM VIDEO DEMODULATOR

| | |
|------------------------|-------------------------------|
| Output Level: | 1 Vpk +/- 10% for Full Output |
| Video Response (3 dB): | 50% of IF Bandwidth |
| Video Gain: | 10% to 100% in 5% Steps |
| Connector Type: | BNC |
| Impedance: | 50 ohms, Selectable |

SWITCHABLE AUDIO OUTPUT

| | |
|--------------------|------------------------------|
| Mode: | AM, FM |
| Level: | 1 VRMS (0 dB Attenuation) |
| Response: | 300 KHz to 3 KHz @ -3dB |
| Attenuation Range: | 40 dB |
| Connector Type: | BNC female |
| Impedance: | 600 ohms |
| Phone Output: | 1/8" Phone Jack, Front panel |

SENSITIVITY AM/FM

| | |
|---------------------------|--|
| 20 kHz IF Bandwidth: | -101 dBm typ |
| 1 MHz IF Bandwidth: | -84 dBm typ |
| 20 MHz IF Bandwidth: | -70 dBm typ |
| AM Sensitivity Condition: | 50 % Modulation, 1 kHz tone, 10 dB S+N/N ratio |
| FM Sensitivity Condition: | 30 % of Selected IF Bandwidth Deviation, 1 KHz tone, 17 dB S+N/N |

BUILT IN TEST (BIT)

Power supply voltages, three phases lock alarm, Over Temp

LOCAL MANUAL CONTROL

All Functions, via Graphical Display Keyboard and Rotary Knob

REMOTE PROGRAMMING

Ethernet 10/100 base-T , RS 422/ RS 485 and RS 232

ENVIRONMENTAL

| | |
|-----------------------|---|
| Operating Temp Range: | 0 to +50 degrees C |
| Non Operating: | -30 to +85 degrees C |
| Relative Humidity : | Up to 95% Non Condensing |
| Altitude: | 10.000 Feet |
| EMI: | Designed to Meet MIL-STD-461C, CE03 and RE02 |
| Shock: | MIL-STD-810E, Method 516.4, Procedure VI |
| Vibration: | Designed to Meet MIL-STD 810E, Method 514.4 Procedure I, Category 9. Figure 514.4-15 |
| Ac Power: | 95 to 265 VAC, 47-63 Hz, 100 Watts |



MECHANICAL

Size: 19" 2U (3.50" H X 22" D X 17" W)

Weight: 20 Pounds

REAR PANEL CONNECTORS

Antenna Input: SMA F

Video Outputs: BNC F

Switchable Audio Output: BNC F

Optional I/Q Demodulation: PCI-Express, One Lane

Log Video Output: BNC F

Analog IF Output: BNC F

Reconstructed IF Output: BNC F

External REF IN, Out: BNC – Female

Ethernet: RJ 45

Remote Interface: DEM – 9S

Summary Alarm: DE – 9D

**Advanced NRT: During frequency sweep the noise floor shape is measured and stored. The noise floor could change due to atmospheric effects, multi path and man made noise. The NRT (Noise Riding Threshold) is calculated by dividing the signal power to stored noise floor data. The shape of the noise floor is updated every sweep.

OPTIONS

OPT-105 0.2 Degree RMS Integrated 100 Hz to 10 MHz

OPT-125 Voice Over IP (VOIP)

OPT-126 Aircraft Power Supply:115 VAC, +/-TBD%, 400 Hz, 100 Watts

OPT-127 CW Chopping

OPT-130 +28V +/-4 Vdc Input Power

Specifications Subject to change without notice

ABOUT FEI-ELCOM TECH, Inc

Elcom designs and manufactures instruments and modules in the RF and Microwave frequency spectrum for broadband and narrow band applications in ATE, Aerospace/ Defense, SIGINT and commercial communications. Proprietary technologies include low phase noise fast switching direct analog synthesis, low noise indirect PLL designs, and RF DSP up to 40GHz.

FOR ADDITIONAL INFORMATION PLEASE CONTACT

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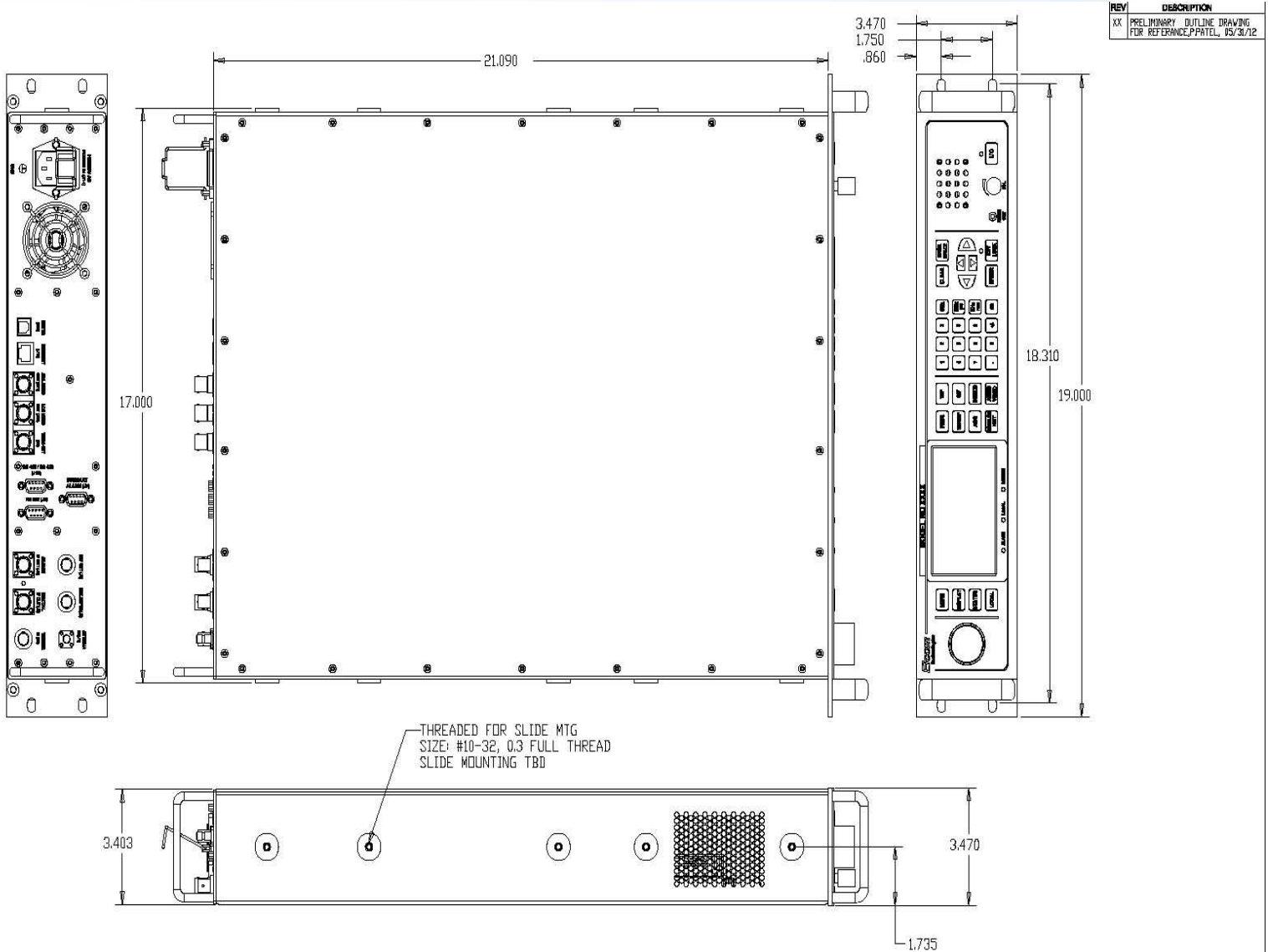
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FEI-Elcom Tech



| REV | DESCRIPTION |
|-----|--|
| XX | PRELIMINARY OUTLINE DRAWING FOR REFERENCE, P.PATEL, 05/28/12 |

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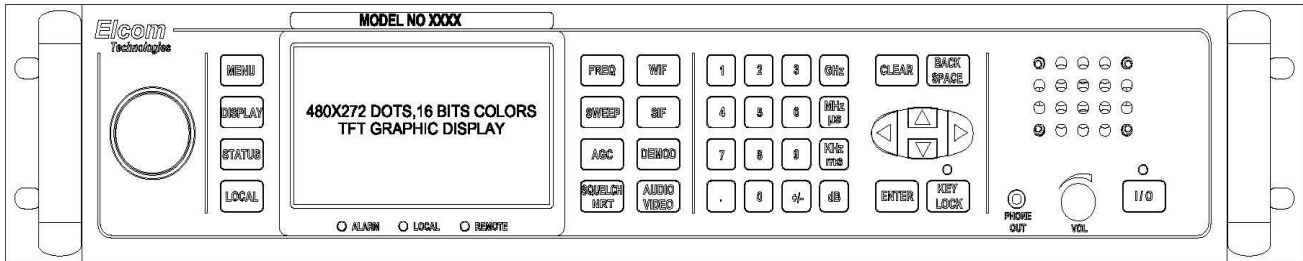
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
 TOLERANCES:
 GENERAL: ±.000, ±.005
 HOLES: ±.003
 ANGLES: 21°
 THREADS:
 COMPUTER GENERATED DRIVING TORQUE NOT REVISED MANUALLY.
 SEE KIT SCALE.

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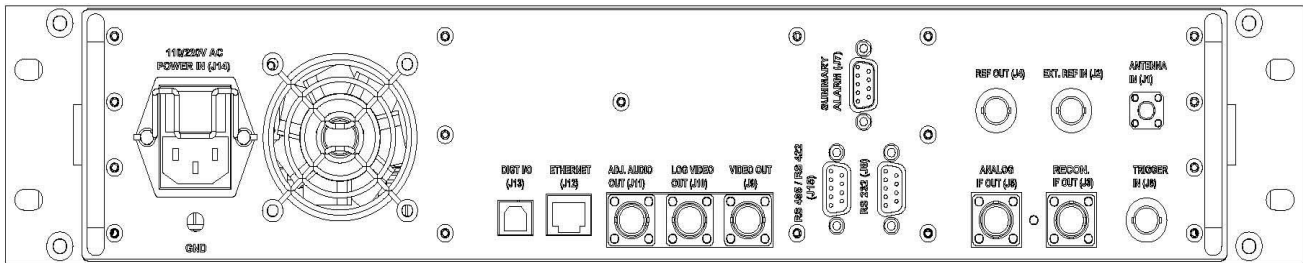
PROJ. DESG: Single Receiver, Front Display, 2U

SIR 3200-40B, OUTLINE VCD

| | | | | | | | |
|----------|--|-------|-------|-------|-----|--------------|----|
| DESIGNED | | SCALE | 0.500 | SHEET | 1/2 | XXXXX-00-VCD | XX |
| DRAWN | | | | | | | |
| CHECKED | | | | | | | |
| APPROVED | | | | | | | |



UNIT FRONT VIEW



UNIT REAR VIEW

CONNECTORS

| | | |
|-----|--------------------|--|
| J1 | SMA-F | ANTENNA INPUT |
| J2 | BNC-F | EXTERNAL REFERENCE INPUT |
| J3 | BNC-F | 10.7/21.4/70 MHz RECONSTRUCTED IF OUTPUT |
| J4 | BNC-F | REFERENCE OUTPUT |
| J5 | BNC-F | 140 MHz ANALOG IF OUTPUT |
| J6 | BNC-F | TRIGGER INPUT (OPTIONAL) |
| J7 | DB-9,M | SUMMARY ALARM |
| J8 | DB-9,F | RS-232 |
| J9 | BNC-F | VIDEO OUTPUT |
| J10 | BNC-F | LOG VIDEO OUTPUT |
| J11 | BNC-F | ADJUSTABLE AUDIO OUTPUT |
| J12 | RJ-45 | ETHERNET 10/100 |
| J13 | USB, B | DIGITAL I/O |
| J14 | POWER ENTRY MODULE | AC POWER INPUT |
| J15 | DB-9,F | RS-485, RS-422 |

| | | | |
|----------------------|-----|--------------|----|
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| 1.00 | 2/2 | XXXXX-00-VCD | XX |