

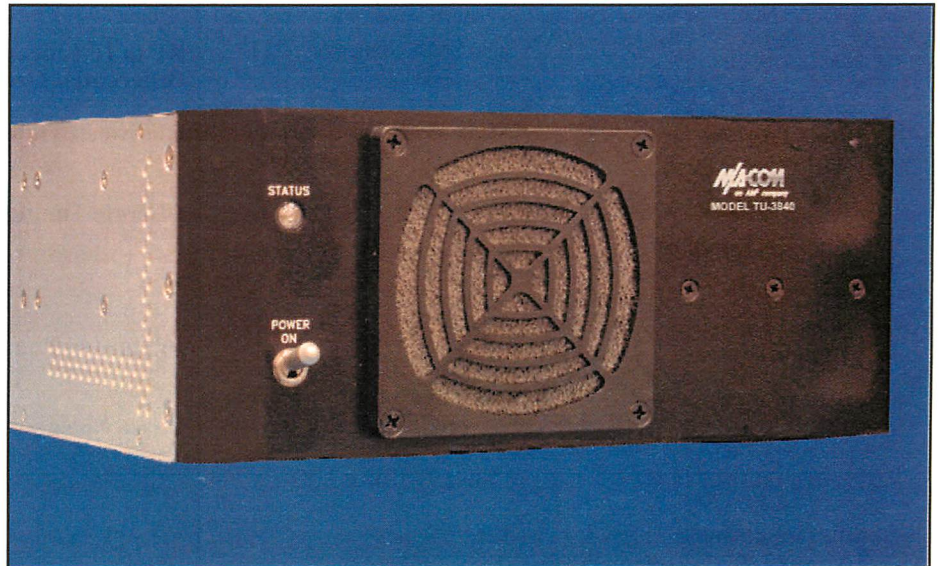


TU-3840 WIDEBAND ELINT TUNER

PRELIMINARY

FEATURES

- 0.1 to 20 GHz, Extendable Up to 40 GHz
- Based on *SEI Certified* SMR-3822 Front-End
- IF Outputs at 1 GHz and 160 MHz
- Controlled from Remote Workstation
- Built-in Test Functions
- F1-F2 Sweep and Fixed Frequencies
- Ethernet 100BaseT control
- RF Blanking (Optional)
- RF Attenuation (Optional)



DESCRIPTION

The TU-3840 Microwave Tuner, a member of the SMR-3000 family of high-performance synthesized microwave receivers, covers 0.1 to 20 GHz. Frequency extension to millimeter wave frequencies is possible using a frequency extender, FE-3820-02. The tuner provides simultaneous wideband IF outputs at 1 GHz (500 MHz bandwidth), and 160 MHz (100 MHz bandwidth). Using YIG based preselector and synthesizer technologies allows for fast sweep times important in the rapid acquisition of threats in the tactical environment. Dual mode operation supporting lower phase noise during selected dwells, overall low noise figure, and high third order intercept permit sensitivities typically achieved by more static analysis receivers.

Remote Control by Laptop or Workstation

Remote control of the tuner is via the Ethernet 100BaseT LAN or RS-232/422 port. A remote control GUI (Graphical User Interface) is provided with

the tuner to allow for tuner controls and BIT.

RF Inputs

Key RF parameters include low noise figure, high intercept point, and high dynamic range. Excellent LO phase noise performance ensures clean down-conversion and low distortion of signal modulation characteristics.

To remove receiver front end gain variations, a gain controlled RF component is set automatically by the microprocessor based on internal calibration tables. Removing the front end gain ripple allows accurate signal amplitude data to be collected.

An optional RF blanking input for front-end protection in a strong signal environment is available. RF step attenuation that is digitally controlled via Ethernet or RS-232 input commands is also available as an option.

IF Outputs

The internal 1 GHz IF from the RF front end is preamplified and power divided. One of the divider outputs is filtered to a 100 MHz bandwidth and down converted to a 160 MHz center frequency.

The TU-3840 Microwave Tuner is powered from the ac mains by an internal autosensing power supply. Built-In-Test (BIT) status of receiver phase lock, power supply voltages, and operating temperature limits are provided. Extensive mechanical and environmental testing ensures that the TU-3840 will perform in the most demanding environments.

RF SPECIFICATIONS AT 25° C

Frequency Range	0.1 to 20 GHz
RF Input Connector	Single SMA connector, 50 Ω input impedance
RF Input Power (Maximum Levels)	+20 dBm CW +30 dBm CW with optional limiter
Long Term Frequency Stability	<1 ppm/Yr
Frequency Accuracy vs. Temperature	<1x10 ⁻⁶ over -10° to 50° C
External Frequency Standard	10 MHz at 0 dBm ± 3 dB, autoswitching
Reference Output	10 MHz, 0 dBm ±3 dB
Tuning Resolution	1 kHz
Linear Dynamic Range	>90 dB, RF to IF, 1 MHz BW
Single Tone Spurious Free Dynamic Range	>60 dB, RF to IF, 1 MHz BW
Two Tone Spurious Free Dynamic Range	>65 dB, RF to IF, 1 MHz BW f1 - f2 <25% of IF BW

IP1dB	-11 dBm, minimum*
Third Order Intercept Point	0 dBm, typ.; -3 dBm, min.*
Image Rejection	>70 dB
LO Reradiation	< -90 dBm at the RF input
Noise Figure Without Optional Attenuator With Optional Blanking Limiter and Attenuator With Optional Attenuator	≤ 13 dB (<11 dB, typ.)* ≤ 19 dB ≤ 17 dB
RF to IF Linear Differential Group Delay	<5 ns, p-p over 80% of IF bandwidth
RF Sweep Time	<100 msec, 0.1-20 GHz, 10 MHz step
Discrete Tuning Speed	F1 to F2, settled to within 1 kHz, <30 msec (TBR) from end of frequency change command
Integrated Phase Noise	<0.5°, RMS, maximum 100 Hz to 100 MHz*
Phase Noise	Offset dBc/Hz (typical) 100 Hz -75 1 kHz -85 10 kHz -90 100 kHz -100 1 MHz -130 10 MHz -140
Tuner RF to IF Gain	20 dB, see IF Output Specifications Table
Log Video	0-2 volts, nominal; 10 MHz bandwidth

*Applies to 80% of the 0.1-20 GHz tuning at 1 GHz and 160 MHz IF's only

IF OUTPUT SPECIFICATIONS

IF OUTPUT PORT	GAIN	NOISE FIGURE (No Attenuation)	BANDWIDTH 0.5-20 GHz (see note)
1 GHz	20 dB, nominal ±1.5 dB (FIXED)	<13 dB	500 MHz
160 MHz Wideband	20 dB, nominal ±2 dB (FIXED)	<13 dB	100 MHz

NOTE
Actual IF bandwidth is 10% of f₀ when the tune frequency is in the range of 0.1 to 0.499999 MHz.

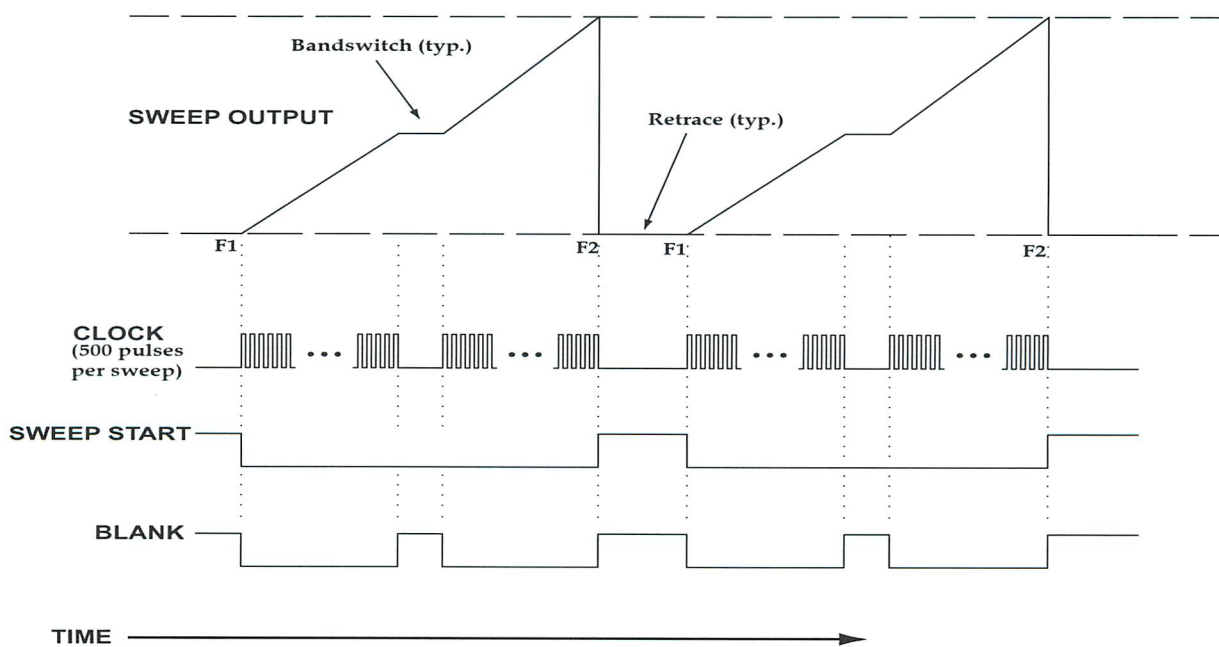
SYSTEM SPECIFICATIONS

OPTIONS (contact factory for further details)

Built In Test	Activated during power up and on command. Monitors power supply voltages, temperature, and phase lock.
Operating Power	100-240 Vac, 47 - 440 Hz
Power Consumption	150 Watts nominal
RFI/EMI	Designed to meet MIL-STD-461E; CE102 & RE102
Enclosure Size	3.5 x 8.5 x 18 inches (8.6 x 24.1 x 45.7 centimeters)
Weight	<27 pounds (12 kg) maximum.
Operating Temperature	-10° to +50° C
Storage Temperature	-30° to +85° C
Control	RS-232/422 & Ethernet 100BaseT
Analog Sweep Output	Differential balanced (2 kΩ load) Linear, F1 to F2 Logic level Sweep start Blanking output signals provided. See Sweep Output Timing Diagram
Altitude	
Operating	10,000 feet
Non-operating	10,000 feet

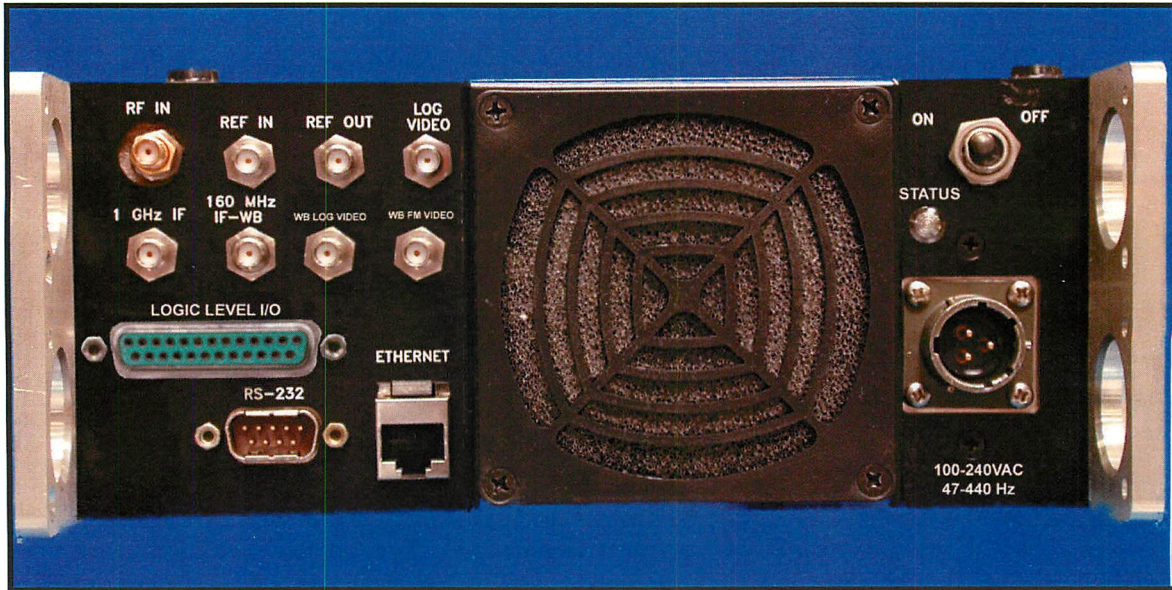
Extended Tuning Range to 40 GHz	Compatible with FE-3820 Frequency Extender
RF Input Blanking	30 dB attenuation 1 usec switch time Logic interface +50 dBm maximum input in blank mode.
RF Input Attenuator	0-70 dB, 10 dB steps
RF Input Limiter	+30 dBm CW, maximum
WB Log Video Output Log Slope	0-2 volts, nominal 25 mV/MHz, nominal
WB FM Discriminator (Requires WB Log Video Option) Output Slope	±1 volt, 5% linearity, 10 mV/MHz, nominal
Spectrum Display Generator	RF sweep and IF pan spectrum displays
Preselect Control Output	Logic level

Specifications subject to change without notice.

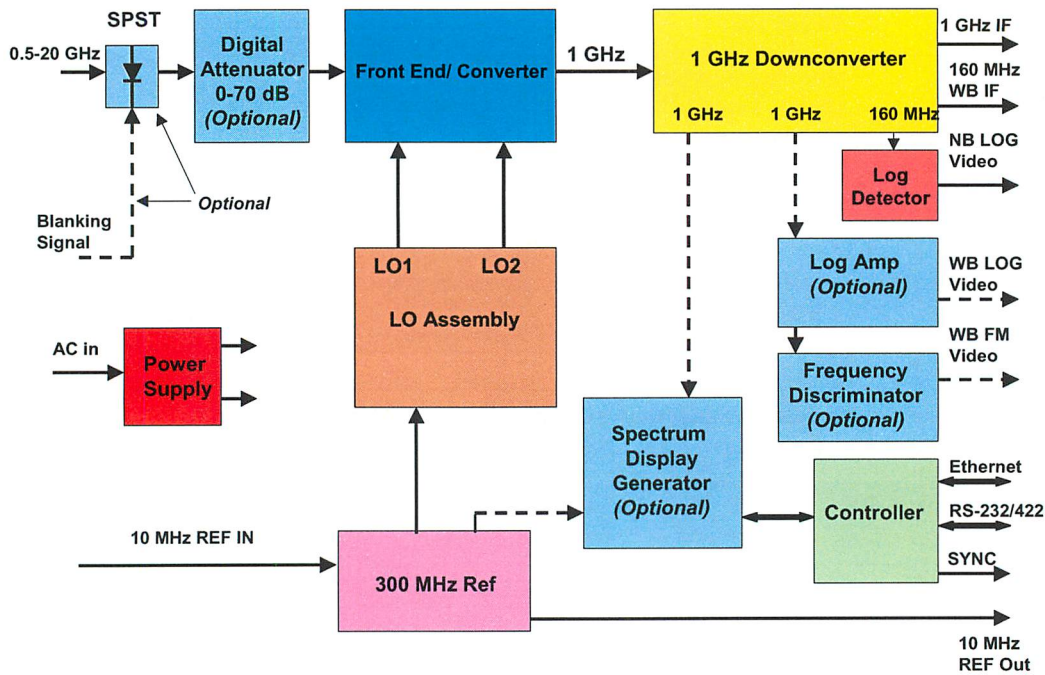


Sweep Output Signals Timing Diagram

Courtesy of <http://BlackRadios.terryo.org>



TU-3840 Connector Panel



TU-3840 BLOCK DIAGRAM



WARRANTY

All M/A-COM SIGINT Products equipment is warranted for one year, except for damage caused by accident or misuse, provided the equipment is returned for repair to the plant in Hunt Valley, Maryland, U.S.A.

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