SMR-5688e-04
LOW BAND ELINT TUNER

PRELIMINARY

FEATURES

- **0.5 to 6 GHz Tuning Range Optional Extension to 18 GHz**
- **Synthesized Tuning in 10 kHz Steps**
- **160 MHz IF Output**
- **SEI Certified**
- **Built-in Comb Generator for BIT and Calibration**
- **Ethernet, RS-422 and Compatibility with Existing TN-340 System Interface**

DESCRIPTION

M/A-COM's new SMR-5688*e*-04 meets the need for a low cost, high performance microwave tuner with direct applicability to replace or enhance current TN-340 assets. The receiver has all the necessary features for maintaining high pulse fidelity for RADAR interception. The SMR-5688*e*-04 electrical design features the low group delay distortion, low phase noise characteristics and high dynamic range necessary in today's demanding signal environments. Through the use of state of the art commercial components coupled with a high volume production line, M/A-COM's SMR-5688*e*-04 sets a new standard for performance-to-cost value in microwave signal reception.

The SMR-5688*e*-04 has a tuning range of 0.5-6.0 GHz with a 160 MHz IF ouput. A switchable RF Comb test signal is available at the receiver input for BIT and calibration. The SMR-5688*e*-04 is intended as a functional replacement for the TN-340 in a set on application with limited tuning range. Sub-octave preselection is provided in all bands to minimize intermodulation products.

All tuner functions are controllable from the front panel or remotely using the fully compatible TN-340 parallel inteface, the optional Ethernet interface or the RS-422 interface. Control and status functions include tuned frequency, IF output frequency, IF Gain level, signal strength, BIT status and receiver I.D. All parameters can be quickly adjusted. A system kill command is provided in order to reset all functions to a default condition and clear memory.

Other features include a 10 MHz reference output, external 10 MHz reference input with autoselect function and built-in-test

(BIT) of power supply voltages, internal temperature and phase lock status. The unit is operational over the -10° to +50° Celcius temperature range. The SMR-5688*e*-04 is housed in a 1 RU (1.75 inches high), full rack-width chassis. All connectors are located on the rear panel. Positive forced air-cooling is provided through front panel cooling fans. Mechanical construction, shielding and filtering techniques assure EMI/RFI compliance with MIL-STD-461C.

The SMR-5688*e*-04 is designed to minimize life-cycle costs and for ease of maintenance. All assemblies and modules are field replaceable. Power, control and signal lines are contained within the same harness and are keyed and labeled to prevent accidental misconnection. No alignment or adjustment is required after module replacement, and modules are interchangeable between tuners.

SMR-5688e RECEIVER SPECIFICATIONS

Frequency Coverage	0.5 to 6 GHz
RF Input Level (Maximum)	+20 dBm without damage
RF Input Connector	SMA
Frequency Resolution	10 kHz
External Reference Input	10 MHz, 0 dBm ±3 dB, SMA connector
Internal Reference Output	10 MHz, +3 dBm ±1 dB
Internal Reference Accuracy and Aging	3×10^{-7} after 1 hr. warmup Aging less than 1×10^{-6} per year
Noise Figure	<15 dB, 0.5-6 GHz; 10 dB, typical
Phase Noise	1.0° rms, maximum, integrated from 100 Hz to 20 MHz
Input VSWR	2.5:1, maximum
Preselection	Suboctave filters
LO Radiation	-90 dBm, maximum antenna conducted
Image Rejection	60 dB, minimum; 80 dB, typical
1 dB Compression Point	-10 dBm
Second Order Input Intercept Point	>+20 dBm
Third Order Input Intercept Point	-5 dBm, minimum; 0 dBm, typical
Single Signal SFDR	60 dB, minimum in 1 MHz bandwidth
LO Spurious	-55 dBc, maximum
Linear Dynamic Range	89 dB, minimum at 1 MHz IF bandwidth
Tuning Speed	50 ms, maximum

160 MHz IF OUTPUT

IF Output Frequency	160 MHz, upright spectrum
Power	+23 dBm, maximum
VSWR	2.0:1
No Signal Spurious	Output with no input signal -90 dBm for any valid tune frequency
Output Connector	SMA
IF Rejection	70 dB, minimum
IF Bandwidths (3 dB)	65 MHz, minimum at 160 MHz
Gain	11 dB ±1.5 dB
Passband Ripple	2 dB p-p at 160 MHz ±25 MHz
Passband Group Delay	5 ns p-p

COMB TEST SIGNAL

Output Frequency	Comb line every 500 MHz from 0.5-6 GHz
Comb Line Accuracy	Within 50 PPM of each comb frequency
Comb Line Level	-30 dBm, maximum -50 dBm, minimum

ENVIRONMENTAL

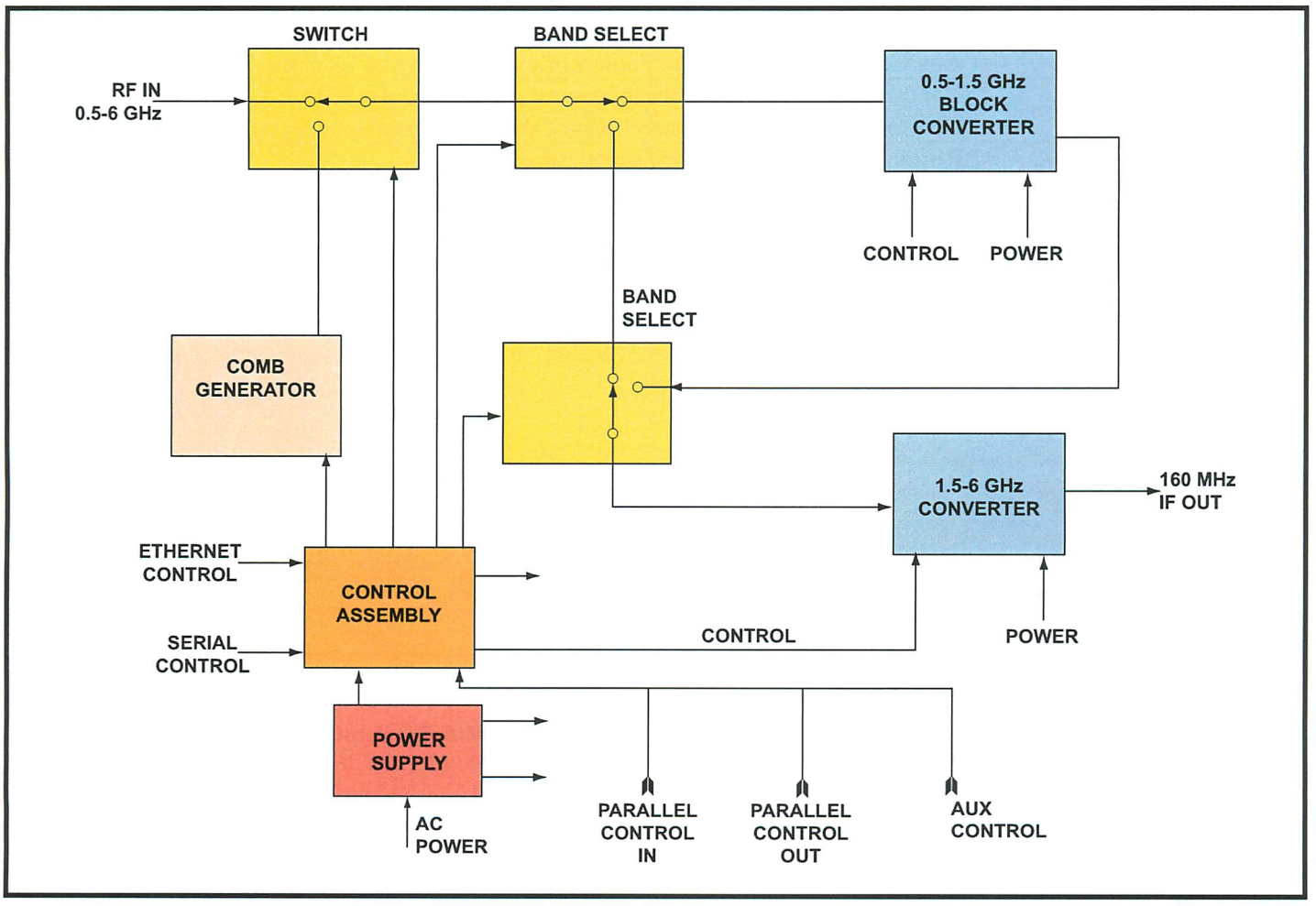
Shock	Meets or exceeds MIL-STD-810D, method 516.3
Vibration	Meets or exceeds, MIL-STD-810D, method 514.3-1
Temperature Range, **Operating** **Storage**	 0^{o} to $+50^{o}$ C -10^{o} to $+65^{o}$ C
Humidity	90% non-condensing at +40°C
Altitude	Operating at 5,000 ft., nonoperating at 40,000 ft.

AC Power	Universal Input - 95-265 Vac, 47-440 Hz, 80 W at 115 Vac, 100 W at 230 Vac
Built-In-Test (BIT)	Power supply voltages, temperature, phase lock status
EMI Shielding	Built to Meet MIL-STD-461C, CE03, and RE02
Size	1.75" H x 22" D x 17" W 4.38 cm H x 55.88 cm D x 43.18 cm W Mounts in Standard 19" rack
Weight	20 lbs. (9.07 kg)
Control Interface	RS-422, Ethernet 100BaseT, TN-340 parallel bus, front panel control

Specifications guaranteed at 25°C.
Specifications are subject to change without notice.

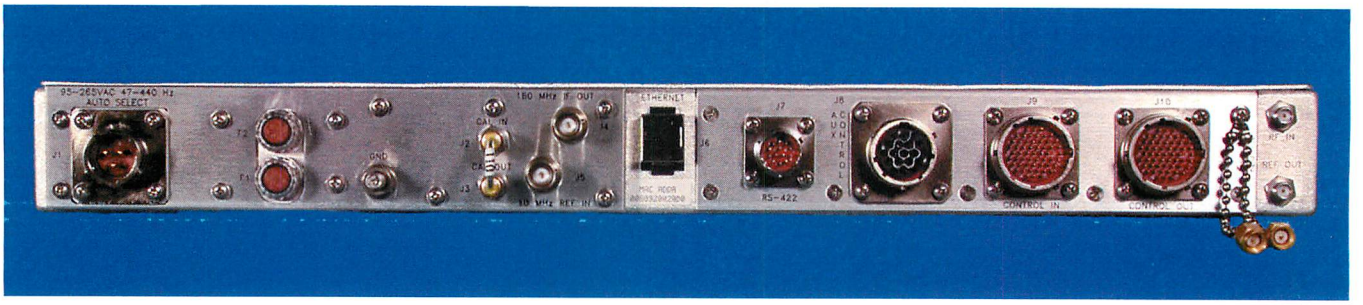
OPTIONS

- Frequency range extended to 18 GHz
- 1 GHz IF output, with 100 MHz bandwidth at the 3 dB points



SMR-5688e-04 BLOCK DIAGRAM

PRELIMINARY



SMR-5688e REAR PANEL PHOTO

CONNECTOR	TITLE	DESCRIPTION
J1	AC Power	95-265 Vac, 47-440 Hz Auto Select
J2	CAL In	Factory calibration and maintenance only
J3	CAL Out	Factory calibration and maintenance only
J4	160 MHz IF Out	Output of 160 MHz IF
J5	10 MHz Ref In	10 MHz input, reference level is 0 dBm ±3 dB
J6	Ethernet	Serial Control, RJ-45 connector
J7	RS-422	Serial Control
J8	Aux Control	For control of external devices IAW the TN-340 ICD
J9	Control In	Parallel control per EDO Corp. ICD
J10	Control Out	Daisy chained parallel control feed through
J11	RF In	RF input 0.5-6 GHz
J12	10 MHz Ref Out	10 MHz output reference level is +3 dBm ±1 dB

INTERFACE CONNECTOR TABLE

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