MT4500

MULTI-BAND ANTENNA MOUNT TRAVELING WAVE TUBE POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS

Ka-Band
RF Module
27.00-31.00 GHz

Tri-Band
RF Module and
Power Supply
5.85-14.50 GHz

V-Band
RF Module
36.00-51.00 GHz
In Discrete Bands
Specifications Available
Upon Request

AVAILABLE AMPLIFIER OPTIONS:

- Linearizer (Same RF Modules)
- Diagnostic Port
- Single Band RF Deck
- Spare Parts Program
- Gain Control
- 1+1 Redundant System
- Remote Controller
- Hand-Held Local Controller
- Sub-Band Optimization

FEATURES:

5 To 51 GHz Coverage In Discrete Bands

RF Deck Change Less Than 10 Minutes

Modular Design Power Supply Plus Plug-In RF Decks

Reduced Overall Weight On Multi-Band Systems

Cost-Effective Depot Logistics

Flexible, Transportable And Rugged

Diagnostic Port For Maintenance Log

Quiet, Efficient Thermal Design

ISO 9001

UL REGISTERED FIRM NO. A3180

CE

CCC RUSSIA

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TRAVELING WAVE TUBE MEDIUM POWER AMPLIFIER

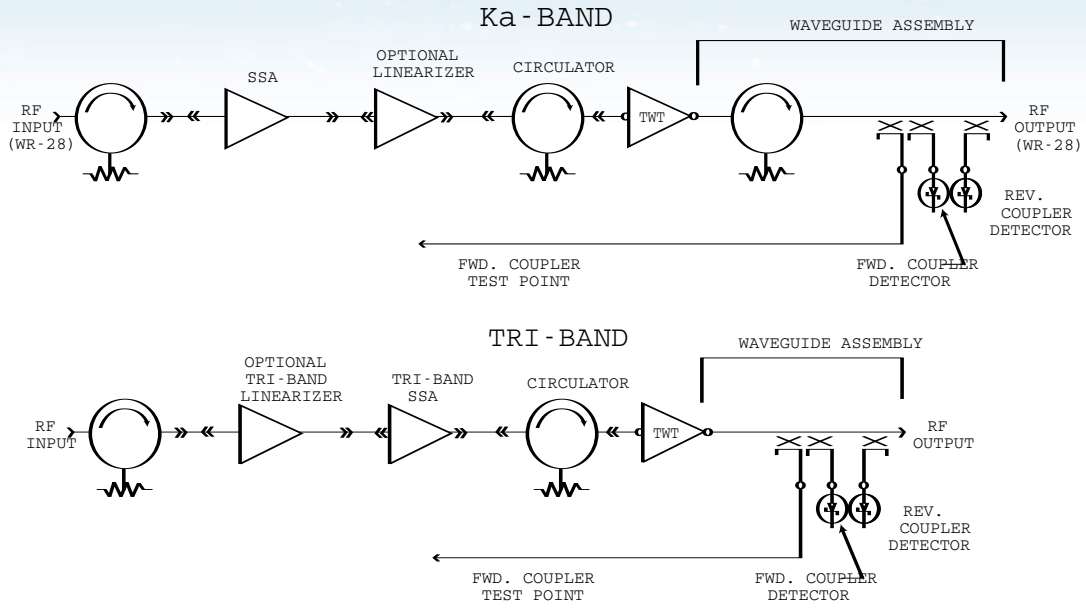
ELECTRICAL SPECIFICATIONS	TRI-BAND C-BAND	TRI-BAND X-BAND	TRI-BAND Ku-BAND	Ka-BAND
Frequency Range (F_0):	5.850 - 6.425 GHz*	7.9 - 8.4 GHz	14.00 - 14.50 GHz*	30.00 - 31.00 GHz*
Tube Output Power (min.):	350 W (55.4 dBm)**	450 W (56.5 dBm)**	350 W (55.4 dBm)**	175 W (52.4 dBm)**
HPA Flange Rated Output:	325 W (55.1 dBm)	400 W (56.0 dBm)	325 W (55.1 dBm)	145 W (51.6 dBm)
Gain:				
Small Signal (min.):	60 dB (80 dB W/Opt Linearizer)			70 dB
Maximum SSG Variation Over:				
Full Band:	±2.0 dB/500 MHz			±1.5 dB/1.0 GHz
Gain Slope, Max.:	±0.04 dB/MHz			±0.04 dB/MHz
Stability, Any Freq. -40 to 50°C:	2.0 dB/p-p typ.			2.0 dB/p-p typ.
Stability, Any Freq. ±10°C Max.:	±0.75 dB			±0.75 dB
Input VSWR:	1.30:1 max. with respect to 50 ohms			1.3:1 max.
Output VSWR:	2.2:1 max.	2.2:1 max.	2.2:1 max.	1.3:1 max.
Load VSWR:	1.6:1 without damage			2.0:1 without damage
AM/PM Conversion:				
At Rated Power:	8.0°/dB			6.0°/dB
6 dB Below Rated Power:	4.0°/dB			2.5°/dB
Residual AM Noise, Max.:				
To 10 kHz:	-50 dBc			
10 - 500 kHz:	-20 (1.5 + Log$f$ kHz) dBc			
Above 500 kHz:	-85 dBc			
Harmonic Output 2nd and 3rd Max.:	-3.5 dBc	-10 dBc	-10 dBc	-15 dBc
Noise & Spurious, Max.:				
Receive Band:	-64 dBW/4 kHz, 3.7 - 4.2 GHz	-64 dBW/4 kHz, 7.25 - 7.75 GHz	-64 dBW/4 kHz, 10.95 - 12.75 GHz	-150 dBW/4 kHz, <26.2 GHz
Transmit Band (F_0):	-64 dBW/4 kHz			-64 dBW/4 kHz
Phase Noise:	-10 dB below IESS Phase Noise Profile			
AC Fundamental:	-36 dBc			
Sum of All Spurs:	-42 dBc			
Intermodulation:				
(for 2 equal carriers relative		Total P_0 / IM Product		Total P_0 / IM Product
to single carrier rated output):		-1.5 dB / -14 dBc		-1.5 dB / -12 dBc
		-4.5 dB / -19 dBc		-4.5 dB / -18 dBc
Linearizer Option:	See product technical note	-4.5 dB / -28 dBc	See product technical note	-4.5 dB / -27 dBc
Group Delay:	Any 40 MHz Bandwidth			Any 60 MHz Bandwidth
Linear:	0.01 nsec/MHz			0.01 ns/MHz
Parabolic:	0.005 ns/MHz^2			0.005 ns/MHz^2
Ripple:	0.5 nsec p-p			0.5 ns p-p
Prime Power:				
Voltage:	115 - 240 VAC, 1-phase, 50 - 60 Hz			
Power Consumption:	2100 VA typ.	2100 VA typ.	2100 VA typ.	650 VA typ.
Power Factor:	0.95 min.			
In-Rush:	28 Amps max.			
Input Transients:	EN61000-4-4, 4-5, 4-11 (Surge, Fast Transients, Line Dropout)			

* Other frequencies or extended bands available upon request. See product technical note.

** Other power levels available upon request. See product technical note.

Note: Performance information is subject to change without notification. Contact MCL for the latest specifications.

RF BLOCK DIAGRAM



CONTROL AND STATUS CAPABILITIES

TYPE	FUNCTION		
Controls	Filament ON/OFF Transmit/Standby RF ON/OFF Reset Attenuation	Units Select Hold Power ON/OFF Auto Switching (1:1) Manual Switching (1:1)	Fault Counter ON/OFF Antenna Position (1:1) Load Position (1:1) Local Remote Computer
Adjustable Parameters	Auto Power Tube Temperature Alarm RF Low Alarm Comm Address Date	Tube Overdrive Alarm RF Reflected Power Alarm RF High Alarm Comm Band Rate Time	Tube Overdrive Fault RF Reflected Power Fault Filament Under Current Fault Comm Protocol
Meters	RF Forward Power Helix Voltage Filament Delay	Tube Drive Helix Current Tube Temperature	RF Reflected Power Filament Current PS Temperature
Faults	Tube Temperature Switch Tube Temperature Analog Helix Run Current HV Under Volt	WG Pressure Helix Surge Current HV Over Volt User Interlock	Arc Test Failed PS Temperature Chassis Interlock Filament Under Current
Alarms	RF High RF Reflected Blower Failed Exciter	RF Low Tube Temperature AC Low Line	Tube Overdrive PS Temperature RF Switch Failed
Additional Status	Delay Summary Alarm Maintenance Log	Transmit Selected Summary Fault Event Log	Sampler Port Cal Table RF Low Switching ON/Off Fault Log

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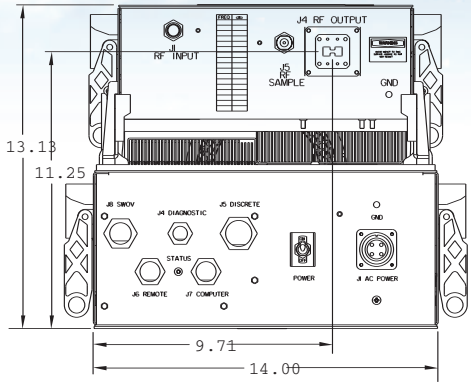
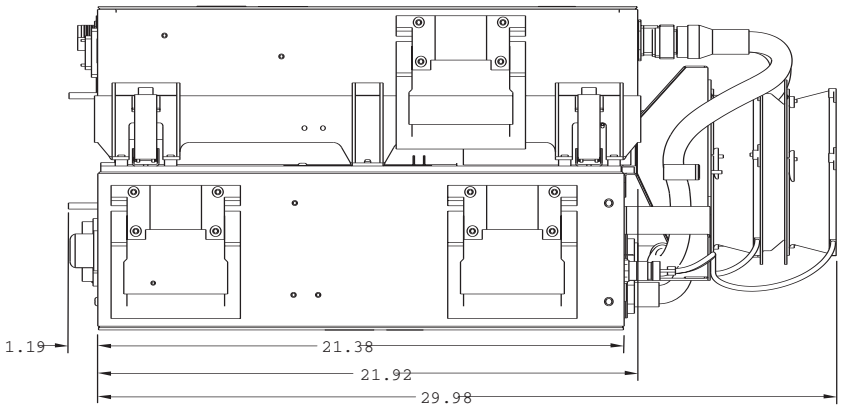
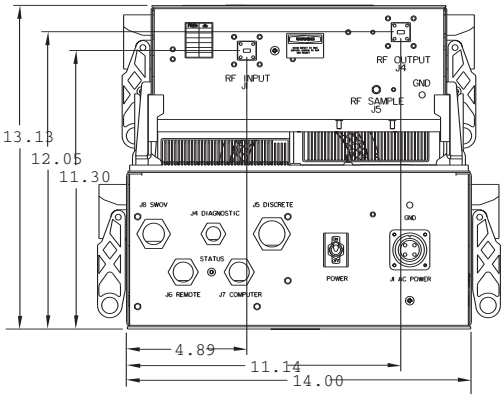
OUTLINE DRAWING

TRI-BAND With Power Supply Deck





Ka-BAND With Power Supply Deck



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:
-40°C to +50°C (derated 1.9°C per 1,000 ft. above sea level)

Non-Operating Temperature:
-40°C to +70°C

Relative Humidity:
100%, condensing

Operating Altitude:
10,000 ft. above sea level (3,048 m) AMSL

Non-Operating Altitude:
50,000 ft. above sea level (15,240 m)

Non-Operating Vibration:
MIL-STD-810F, Proc. 1, Cat 4, Figure 514.5C-1, 2, 3

Non-Operating Shock:
MIL-STD-810F, Method 516.5, Procedure VI - Bench Handling

MECHANICAL SPECIFICATIONS

RF Output Connectors:

Tri-Band RF Deck:	WRD-580D28, Cover
Ka-Band RF Deck:	WR-28, Cover

Installed Weight:

Power Supply Deck:	49 lbs. typical
Tri-Band Deck:	50 lbs. typical
Ka-Band Deck:	37 lbs. typical

Cooling:
Forced air

Acoustic Noise:
<75 dBA, 3m from air intake

PHYSICAL SPECIFICATIONS

Dimensions:
14.2" H
16.4" W
31.0" L

Air Flow:
200 CFM

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