TDC

Theater Deployable Communications

Baseline Requirements Document

SPICE Satellite Baseband Module

(v1)

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1.0 SCOPE

This requirements document establishes the performance, manufacture and test requirements for the Theater Deployable Communications (TDC) Small Package Initial Communications Equipment (SPICE) Satellite Baseband Module or SSBM.

2.0 APPLICABLE DOCUMENTS

To the extent specified herein, the following documents of latest current issue on the date of this document, form a part of this document.

Table 1 - Standards and Applicable Documents

Document Number	Title
EIA/TIA-232-E Jul 94	Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Binary Data Interchange (Rates to 20 kbps)
ISO/IEC 8802-3 1996ANSI/IEEE Std 802.3 1996	Information Technology-Local Metropolitan Area Network-Part3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access Method and Physical Layer Specification.
TIA/EIA–422–B	Electrical Characteristics of Balanced Voltage Digital Interface Circuits (ANSI/TIA/EIA–422–B–94) (May, 1994)
EIA–530	High Speed 25 — Position Interface for Data Terminal Equipment and Data Circuit — Terminating Equipment, (June 1992)
MIL-STD-810F	Environmental Test Methods
Group Technologies Corporation Specification Number 36024531	Performance and Interface Specification for KIV-19A Trunk Encryption Device (TED)
Air Force Document	TDC Standards Document

3.0 REQUIREMENTS

The Theater Deployable Communications (TDC) Small Package Initial Communications Equipment (SPICE) Terminal is a lightweight, transportable, small storage footprint, Satellite Communications (SATCOM) terminal. The terminal will be rapidly deployable anywhere in the world to provide global SATCOM communications capability. The terminal will provide deployed units access to both secure (SIPRNET) and sensitive but unclassified (NIPRNET) data networks and services as well as limited voice over internet protocol (VOIP) capability.

The SPICE terminal includes an Antenna / Radio Frequency Subsystem, Satellite Baseband Module, SIPRNET Module and NIPRNET Module. The requirements for the SPICE Satellite Baseband Module (SSBM) are defined in this baseline requirements document (BRD).

3.1 Module Definition

The SPICE Satellite Baseband Module (SSBM) contains a KIV-19A Trunk Encyption Device (TED) for long haul bulk encryption of the SPICE off base trunk. The KIV-19A can handle data rates from 9.6 kbps to 13 Mbps. It also contains a Comtech EF Data SDM-300L satellite modem which accepts serial digital data from the TED at data rates up to 5 Mbps, processes the data using standard encoding/decoding and modulation/demodulation formats, and interfaces with the Antenna / RF Subsystem at L-band (950 to 1750 MHz). In addition, it contains the control processor needed to control the terminal. Figure 1 shows a functional diagram of the SSBM and the interconnections within the TDC SPICE terminal.

The SSBM also contains a ruggedized laptop which provides for control monitor and alarm (CMA) of the Satellite terminal. The laptop is stored in the SSBM transit case for transport.

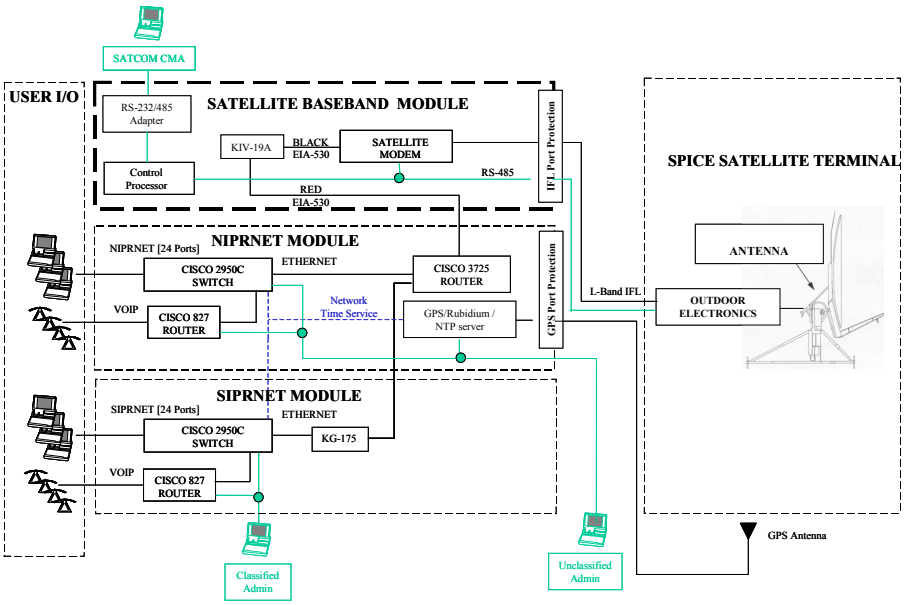

Figure 1 - SPICE NIPRNET Module Functional Diagram

3.2 Performance Requirements

3.2.1 Electrical Interface Requirements (External)

The SSBM shall include the number and type of external interfaces presented in Table 2.

Table 2 - SSBM External Interface Characteristics

Signal Name	Quantity	Connector	Primary Interface	Electrical Characteristics
Prime Power	1	IEC 320 C-20 Receptacle	AC Power	100 to 130 VAC, 200 to 240 VAC, 50 to 60 Hz
Red I/O DCE (KIV-19A Red Port)	1	DB-25 (F)	KIV-19A Red Port	EIA-530
Black I/O DTE (KIV-19A Black Port)	1	DB-25 (F)	KIV-19A Black Port	EIA-530
Black Station Clock In (KIV-19A)	1	Triax (F)	KIV-19A Clock In	50 ohm, EIA-422
Clock Phase Select	1	Double Pole Switch	KIV-19A Clock Phase Select Switch	N/A
Modem Serial Data	1	DB-25 (F)	SDM-300L Modem	EIA-530

Table 2 - SSBM External Interface Characteristics

Signal Name	Quantity	Connector	Primary Interface	Electrical Characteristics
Modem L-Band Tx	1	Type N	SDM-300L Modem	50 ohm
Modem L-Band Rx	1	Type N	SDM-300L Modem	75 ohm
Modem Ext Ref In	1	Triax (F)	SDM-300L Modem	75 ohm
CMA Remote Control	1	DB-9 (F)	Control Processor	RS-485 or RS-232

3.2.1.1 Prime Power

The SSBM is designed to operate from 100 to 130 VAC and 200 to 240 VAC, 50 to 60 Hz, single phase, three-wire power in accordance with the TDC Standards Document. The SSBM includes an internal uninterruptible power supply (UPS) to minimize line variation and transients and provide backup power to allow graceful shutdown. The prime power connector is an IEC 320-C20 receptacle.

3.2.1.2 KIV-19A Red Data Interface Connector

The KIV-19A RED I/O connector is a female DB-25 type connector in accordance the EIA-530/ DTE standard. Pin assignments are shown in Table 3.

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Table 3 - KIV-19 RED I/O Connector

Pin	Signal	I/O	Pin	Signal	I/O
1	Shield	–	14	Transmit Plain Text (-)	I
2	Transmit Plain Text (+)	I	15	Red Station Clock (+)	O
3	Receive Plain Text (+)	O	16	Receive Plain Text (-)	O
4	Resync (-)	I	17	Receive Plain Text Clock(+)	O
5	NC	–	18	NC	–
6	NC	–	19	Resync (+)	I
7	Ground	–	20	NC	–
8	NC	–	21	NC	–
9	Receive Plain Text Clock(-)	O	22	NC	–
10	NC	–	23	NC	–
11	NC	–	24	NC	–
12	Red Station Clock (-)	O	25	NC	–
13	NC	–			

3.2.1.3 KIV-19A Black Data DCE Interface Connector

The KIV-19A Black I/O connector is a female DB-25 type connector in accordance the EIA-530/ DTE standard. Pin assignments are shown in Table 4.

Table 4 - KIV-19A Black I/O Connector

Pin	Signal	I/O	Pin	Signal	I/O
1	Shield	–	14	Tx Data Out (-)	O
2	Tx Data In (+)	O	15	Tx Clock Out (+)	I
3	Rx Data Out (+)	I	16	Rx Data Out (-)	I
4	NC	–	17	Rx Clock Out (+)	I
5	NC	–	18	NC	–
6	NC	–	19	NC	–
7	Signal Return	–	20	NC	–
8	NC	–	21	NC	–
9	Rx Clock Out (-)	I	22	NC	–
10	NC	–	23	NC	–
11	Tx Clock In (-)	O	24	Tx Clock In (+)	O
12	Tx Clock Out (-)	I	25	NC	–
13	NC	–			

3.2.1.4 Clock Phase Select

The SSBM provides a Phase Select switch for the KIV-19A TED. This toggle switch will invert the RSC signal at the point where TXPT data is clocked into the KIV-19A. This will allow the proper phase relationship to be maintained between the internal signal Buffered Transmit Plain Text Clock, that is derived from the Black Station Clock (BSC), and Buffered Transmit Plain Text Data.

3.2.1.5 Modem Data Port

The Modem baseband data interface connector is a female DB-25 type connector in accordance the EIA-530 standard. Pin assignments are shown in Table 5.

Table 5 - Modem EIA-530 Serial Data Interface

Pin	Signal	I/O	Pin	Signal	I/O
1	Shield	–	14	Send Data [B] [+]	I
2	Send Data A[-]	I	15	Send Timing A [-]	O
3	Receive Data A [-]	O	16	Receive Data B [+]	O
4	Request to Send A [-]	O	17	Receive Timing A [-]	O
5	Clear to Send A [-]	I	18	LL	O
6	Data Mode A [-]	I	19	Request to Send B [+]	O
7	Signal Ground	–	20*	Master Clock A[-]	I
8	Receiver Ready A [-]	I	21	Demodulator Fault	O
9	Receive Timing B [+]	O	22	Data Mode B [+]	I
10	Receiver Ready B [+]	O	23*	Master Clock B [+]	I
11	Terminal Timing B [+]	O	24	Terminal Timing A [-]	I
12	Send Timing B [+]	O	2	Modulator Fault	–
13	Clear to Send B [+]	I			

***** Use Master Clock for External Clock Input

3.2.1.6 Modem TX L-Band IF

The Transmit IF Output Port is a 50 ohm female N type connector that can be used for L-Band IF. The IF Frequency can be programmed to 950 – 1750 MHz, in 100 Hz steps.

3.2.1.7 Modem RX L-Band IF

The Receive IF Input Port is a 75 ohm female N type connector that can be used for L-Band IF.

3.2.1.8 Modem External Reference In

The External Reference Input is a 75 ohm female Triax type connector. Reference frequencies are 1, 10 and 20 MHz.

3.2.1.9 CMA Control Port

The CMA Control port is in accordance with the DB 9 RS-232 standards using the VT100 Emulators. The CMA control connector is a DB-9F with pin assignments as shown in Table 6.

Table 6 - Admin Interfaces

Pin	Signal	Pin	Signal	Pin	Signal
1	Data Carrier Detect	4	Data Terminal Ready	7	Request to Send
2	Received Data	5	Signal Ground	8	Clear to Send
3	Transmitted Data	6	Data Set Ready	9	Ring Indicator

3.2.2 Electrical Interface (Internal)

This documentation shows the internal wiring of the major module components and the details of each major cable assembly internal to the module. This information is found in Section 6.3.

3.2.3 Functional Requirements

3.2.3.1 Module Equipment Details

The following subsections provide details of the functionality of the major equipment in the SPICE Satellite Baseband Module.

3.2.3.1.1 KIV-19A

The SSBM provides a KIV-19A (KG-94, KG-194 compatible) crypto device for bulk encryption/ decryption of the aggregate data channel that interfaces to the SPICE satellite terminal.

Traditional keying material is loaded into the KIV-19A. The following loading equipment can be used to load the KIV-19A - Key Loaders KYK-13, KYX-15, KOI-18 and KOK-12. The Data Transfer Device (DTD) interfaces directly to the DS-102 fill port of the KIV-19A.

3.2.3.1.2 Satellite Modem

The SDM-300L satellite modem is a full duplex modem which offers variable data rates from 2.4 kbps to 5.0 Mbps, in BPSK, QPSK, OQPSK, and 8PSK. Viterbi, Sequential, concatenated Reed-Solomon (RS), Trellis Coded Modulation (TCM), and Turbo Product Coding (TPC) are provided as Forward Error Correction (FEC) options. EIA-232, EIA-422, G.703, and V.35 (25-pin) interface types are available. The range of IF frequency simultaneously covers 950 to 1750 MHz.

3.2.3.1.3 Control Processor

The control processor provides a common interface point between the laptop computer and the other satellite terminal equipment (satellite modem, up/down converter, block converter, high power amplifier, etc).

3.2.3.2 CMA Control

The control, monitoring and alarm functions are administered via an external laptop computer interconnected to the control port connector using 9600 baud, 8 data, no parity, 1 stop bit as the connection parameters.

3.2.3.3 Configuration Options

None

3.2.4 Physical Characteristics

3.2.4.1 Transit Case

The SSBM is housed in an 8 U transportable container (transit case), approximately 22.5”W. x 18.1”H. x 34.5”D. The transit cases are designed to stack on top of and mechanically interlock to like cases. The frame inside the transit case is designed to slide out of the case to allow removal and replacement of Line-Replaceable-Units in the field. The transit cases with their covers in place are designed to protect the electronic equipment inside from direct exposure to environmental conditions; e.g., rain, snow, ice, dust, etc., likely to be encountered during world wide military transit.

3.2.4.2 Weight

The SSBM, including all internally carried cables, does not exceed TBD pounds.

3.2.4.3 Storage Space

The SSBM transit case includes storage pouches within its covers to contain the cables and manuals that must be transported and used with the module.

3.2.4.4 Marking

See TDC Standards Document for required markings.

3.2.5 Cables and Accessories

The SSBM includes the cables listed in Table 7, stored within the covers. Strain relief and cable management hardware are provided with the module.

Table 7 - Cables and Terminators included with SSBM

Function	Color Code	Quantity	Description
(P1) Cable (in pouch)	N/R	1	CMA Control Cable, DB9 plug to DB9 jack (10 feet)
(L1) Cable (in cable bag)	N/R	1	RS-485 Control Cable to Outdoor Electronics (100 feet)

Table 7 - Cables and Terminators included with SSBM

Function	Color Code	Quantity	Description
(L2, L3) Modem Cable (cable bag)	N/R	2	Inter-module Cable, Type N Male-to-Male (straight-through) (100 feet)

3.2.6 Reliability

The module with its standard complement of LRUs, have a mean time between failure (MTBF) commensurate with similar commercial equipment in its class. The actual MTBF for the major system components are shown in Table 8. Where reliability data is not readily available from the vendor, this is indicated.

Table 8 - MTBF of Major Components

Component	MTBF
KIV-19A	5000 hours
SDM-300L Satellite Modem	Not Available
Control Processor	Not Available

3.2.7 Maintainability

Maintainability characteristics will be part of the selection criteria for all hardware. Ease of maintenance, such as accessibility to Line Replaceable Units, fault detection/isolation software capability, and fault annunciation will be considered.

3.2.7.1 Mean Time Between Preventive Maintenance

The Mean Time Between Preventive Maintenance, during operation, is 30 days. The duration of preventive maintenance actions such as corrosion control, cleaning filters, etc., does not exceed 30 minutes.

3.2.8 Environmental Conditions

During storage, transport and operation the modules can withstand exposure to temperatures as shown in Table 9.

3.2.8.1 Temperature

Temperature characteristics for the major equipment components are shown in Table 9.

Table 9 - Module Temperature Characteristics

Equipment	Temperature (degrees C)	
	Operating	Non-Operating
KIV-19A	-41 to 70	-57 to 71

Table 9 - Module Temperature Characteristics

Equipment	Temperature (degrees C)	
	Operating	Non-Operating
SDM-300L Satellite Modem	0 to 50	-40 to 70
Control Processor	N/A	N/A

3.2.8.2 Relative Humidity

Relative humidity characteristics for the major equipment components are shown in Table 10.

Table 10 - Module Humidity Characteristics

Equipment	Humidity
	Non-condensing
KIV-19A	0 to 95%
SDM-300L Satellite Modem	0 to 95%
Control Processor	N/A

3.2.8.3 Altitude

Altitude characteristics for the major equipment components are shown in Table 11.

Table 11 - Module Altitude Characteristics

Equipment	Altitude (feet)	
	Operating	Non-Operating
KIV-19A	0 to 15,000	0 to 40,000
SDM-300L Satellite Modem	Not Available	Not Available
Control Processor	Not Available	Not Available

3.2.8.4 Sand and Dust

During storage and transport, the modules are protected when exposed to sand and dust in accordance with the best commercial practices for close proximity to operating aircraft. During operation with covers removed, the modules can withstand sand and dust in accordance with the best commercial practices for natural conditions.

3.2.8.5 Shock

Module equipment racks are equipped with rubber shock isolation mounts and is protected from shocks induced during handling, setup and tear down. Modules and components can operate without degradation following exposure to the non-operating shock environment described by Method 516.5, Procedure VI (Bench Handling) of MIL STD 810F.

3.2.8.6 Vibration

The modules are equipped with rubber shock isolation mounts so that the modules can withstand the vibration encountered while being transported by commercial and military airlift, sealift and vehicular (over unimproved roads) systems. MIL-STD-810F, Method 514.5, Procedure I, Categories 4, 7 and 8. applies; alternative procedures may be substituted after TDC Program Office approval.

3.3 Design and Construction

3.3.1 Material Parts and Processes

This module is built to good commercial practices. Mechanical and electrical interchangeability exists between like systems, subsystems, assemblies, subassemblies and replaceable parts.

3.3.2 Safety

This module shall not present a safety, fire or health hazard to personnel.

3.3.2.1 Electrical Safety

This module is designed to eliminate the hazard to personnel of inadvertent lethal voltage contact. All electrical conductors carrying voltages in excess of 70 volts shall be insulated to prevent contact or covered by a protective barrier. All removable protective barriers shall be interlocked to automatically disconnect power behind the barrier upon removal or clearly marked with a warning label that indicates the voltage potential that will be encountered behind the barrier. All warning labels shall remain visible after the cover has been removed.

3.3.2.2 Mechanical Safety

Sharp surfaces shall have protective covers or other suitable features to minimize injury where personnel are likely to be exposed to such surfaces.

3.4 Logistics

This module accommodates a two level maintenance concept: organizational (Air Force personnel) and depot (contractor personnel). Removal and replacement of an LRU is defined at the organizational level and any needed repair of the LRU is defined at the depot level. Any special test or support equipment required to effect removal or replacement of an LRU at the organizational level can be provided as part of the module. No more than two persons shall be required to remove or replace an LRU.

An LRU is defined as the lowest element of the module which can be isolated to be faulty through inspection; built-in test; technical manuals; TDC-ICAP system performance; spares substitution; or other diagnostic aid approved by the Government for organizational level maintenance, exclusive of expendables such as fuses, lamps and LEDs. An LRU is defined at the card/module level or higher.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 General

The quality assurance program includes tests and other evaluations to the extent specified herein. The quality assurance program is designed to verify the electrical, mechanical and functional characteristics of each module. The purpose is to ensure that each module complies with or performs better than the requirements specified herein.

4.2 Responsibility for Inspection

Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements and may use his own or any other facilities suitable for the performance of the inspection requirements. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to the prescribed requirements.

4.3 Product Qualification Test (PQT)

Inspections, analyses, demonstrations and tests were used to verify compliance of Section 3 of this specification on the initial module.

4.3.1 Production Acceptance Test (PAT)

Each module delivered to the Government undergoes a Production Acceptance Test (PAT) as identified in Table 12. The acceptance test verifies that the module interfaces are operating properly prior to delivery to the Government. The SSBM Acceptance Test Procedure governs the performance of the PAT.

4.3.2 Verification Cross-Reference Matrix (VCRM)

Table 12 provides a list of each Section 3 requirement and the verification method to be used. The following paragraphs define the codes employed in the VCRM. Unless otherwise noted, where more than one verification method is shown, one method or a combination of methods may be used to show compliance.

4.3.3 Not Required (N/R)

This method indicates that verification is not required because the paragraph is a title, heading, general introductory paragraph or statement of a goal and contains no “shall” or “must” statements.

4.3.4 Inspection

Inspection is a method of verification of the module performance or characteristics by examination of the equipment or associated documentation. Inspections are conducted with the use of inspection tools, measurement devices, visual means and comparison. Most inspections

apply to verification of requirements associated with physical characteristics such as size, weight, appearance, adherence to specified standards and engineering practices, quality design, and construction supported with quality documentation. Inspections also include the auditing of manufacturer's data that verifies the performance of non-developmental items that comprise the TDC ICAP module. Inspections may occur during any assembly stage of the unit under test.

4.3.5 Analysis

Analysis is a method of verification through technical evaluation of calculations, computations, models, analytical solutions, use of studies, reduced data, and/or representative data to determine that the item conforms to the specified requirements.

4.3.6 Demonstration

Demonstration is a method of verification whereby the properties, characteristics and parameters of the item are determined by observation alone and without the use of instrumentation for quantitative measurements. This method is used when a requirement does not contain a specific numerical parameter, which must be measured. Demonstrations may occur during verification of a unit under test at any assembly stage. Pass/fail criteria are simple yes/no indications of functional performance since no quantitative values are specified.

4.3.7 Test

Test is a method to verify that a specified requirement is met by thoroughly exercising the applicable item under specified conditions and by using the appropriate instrumentation in accordance with test procedures. This method requires the use of laboratory equipment, simulators, or services to verify compliance to the specified requirements. This method is used when it is practicable to make direct or indirect measurement of a specified numerical parameter to verify compliance with a requirement. Tests may occur during verification of a unit at any assembly stage. Actual measured values are recorded, and pass/fail is determined by comparing the measured value with the specified value. Measurement accuracy shall be precise enough to ensure that the measured value is within the specified tolerance.

Table 12 - Verification Cross Reference Matrix

		Verification Method					
			PQT				
Paragraph	Title	N/R	Inspect	Analysis	Demo	Test	ATP
3.0	Requirements	X					
3.1	Module Definition	X					
3.2	Performance Requirements	X					
3.2.1	Electrical Interface Requirements (External)	X					
3.2.1.1	Prime Power					X	
3.2.1.2	KIV-19A Red Data Interface Connector				X		X

Table 12 - Verification Cross Reference Matrix

Paragraph	Title	Verification Method					
			PQT				
		N/R	Inspect	Analysis	Demo	Test	ATP
3.2.1.3	KIV-19A Black Data Interface Connector				X		X
3.2.1.4	Clock Phase Select				X		X
3.2.1.5	Modem Data Port				X		X
3.2.1.6	Modem TX L-Band IF				X		X
3.2.1.7	Modem RX L-Band IF				X		X
3.2.1.8	Ext Reference In				X		X
3.2.1.9	CMA Control				X		X
3.2.2	Electrical Interface (Internal)	X					
3.2.3	Functional Requirements	X					
3.2.3.1	Basic Configuration	X					
3.2.3.1.1	KIV-19A		X		X		X
3.2.3.1.2	Satellite Modem		X		X		X
3.2.3.1.3	Control Processor		X		X		X
3.2.3.2	CMA Control		X		X		X
3.2.3.3	Configuration Kits	X					
3.2.4	Physical Characteristics	X					
3.2.4.1	Transit Case		X				
3.2.4.2	Weight					X	
3.2.4.3	Storage Space		X				
3.2.4.4	Marking		X				
3.2.5	Cables And Accessories				X		
3.2.6	Reliability			X			
3.2.7	Maintainability			X			
3.2.7.1	Mean Time Between Preventive Maintenance [MTBPM]			X			
3.2.8	Environmental Conditions	X					
3.2.8.1	Temperature					X	
3.2.8.2	Relative Humidity			X			
3.2.8.3	Altitude			X			
3.2.8.4	Sand and Dust			X			
3.2.8.5	Shock					X	
3.2.8.6	Vibration					X	
3.3	Design and Construction	X					
3.3.1	Materials Parts and Processes			X			
3.3.2	Safety	X					
3.3.2.1	Electrical Safety			X		X	

Table 12 - Verification Cross Reference Matrix

Paragraph	Title	Verification Method					
			PQT				
		N/R	Inspect	Analysis	Demo	Test	ATP
3.3.2.2	Mechanical Safety		X	X			
3.4	Logistics			X			

5.0 PREPARATION FOR DELIVERY

Each module shall be packaged for shipment and the package marked in accordance with the requirements of the contract under which the module is ordered.

6.0 BASELINE CONFIGURATION

6.1 Equipment

Table 13 - Equipment Listing

Device	Manufacturer	Part Number	Description	Quantity
Encryptor	Group Tech	KIV-19A	Encryptor	1
Frame	Group Tech	36025800	KIV-19A frame	1
Modem	Comtech	SDM-300L	Satellite Modem	1
Control Processor	TBD	TBD	Satellite Control Processor	1
RS-232/485 Adapter	TBD	TBD	CMA RS-232/485 Adapter	1
Laptop	Panasonic	CF-29CTKGZKM	Toughbook 29 Laptop	1
UPS	UPSI	650BRS	Uninterruptible Power Supply	1
Transit Case	ECS Composites	TBD	8U Transit Case	1
(W1) Cable	TBD	TBD	KIV19A to Red I/O/Phase Select	1
(W2) Cable	TBD	TBD	KIV19A to Black I/O and BSC	1
(W3) Cable	TBD	TBD	Modem Serial Data Cable	1
(W4) Cable	TBD	TBD	Modem Ext Clock Cable	1
(W5) Cable	TBD	TBD	Modem L-Band Tx Cable	1
(W6) Cable	TBD	TBD	Modem L-Band Rx Cable	1
(W7) Cable	TBD	TBD	CMA Control Cable w Adapter	1
(W8) Cable	TBD	TBD	Modem Power Cable	1
(W9) Cable	TBD	TBD	KIV-19A Power Cable	1
(W10) Cable	TBD	TBD	RS-485 Control Cable to DF (Outdoor Electronics)	1
(P1) Cable (In Pouch)	TBD	TBD	CMA Control cable, DB9 plug to DB9 jack, 10 ft. (Stored in Pouch)	1
(L1) Cable (Stored In Cable Bag)	TBD	TBD	RS-485 Control Cable to Outdoor Electronics 100 ft	1
(L2, L3) Modem Cable (Stored In Cable Bag)	TBD	TBD	Inter-module Cable; Type N Male-to-Male (straight-through) 100 ft	2

6.2 Elevation Drawings

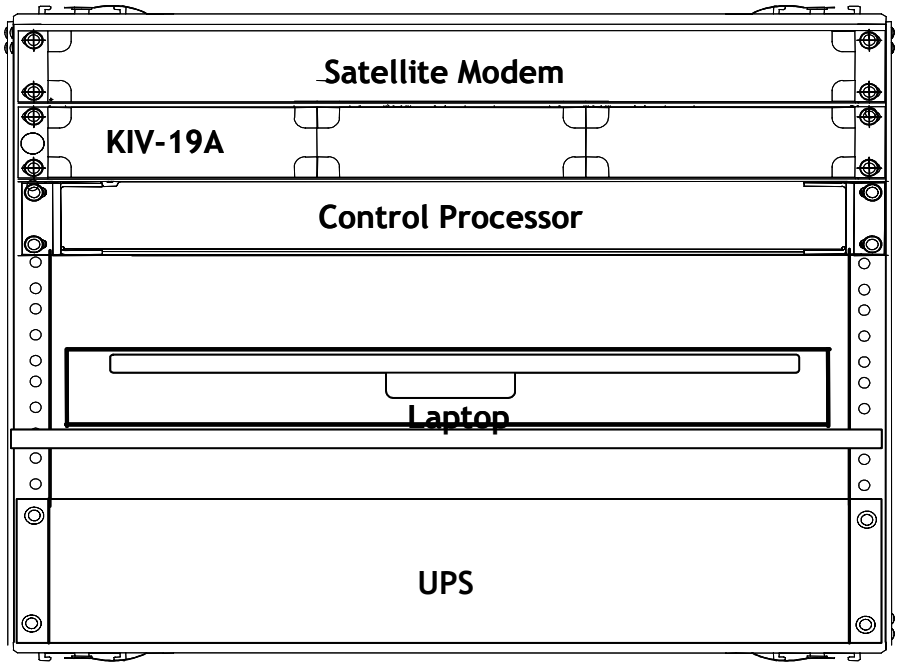

Figure 2 - Front Elevation

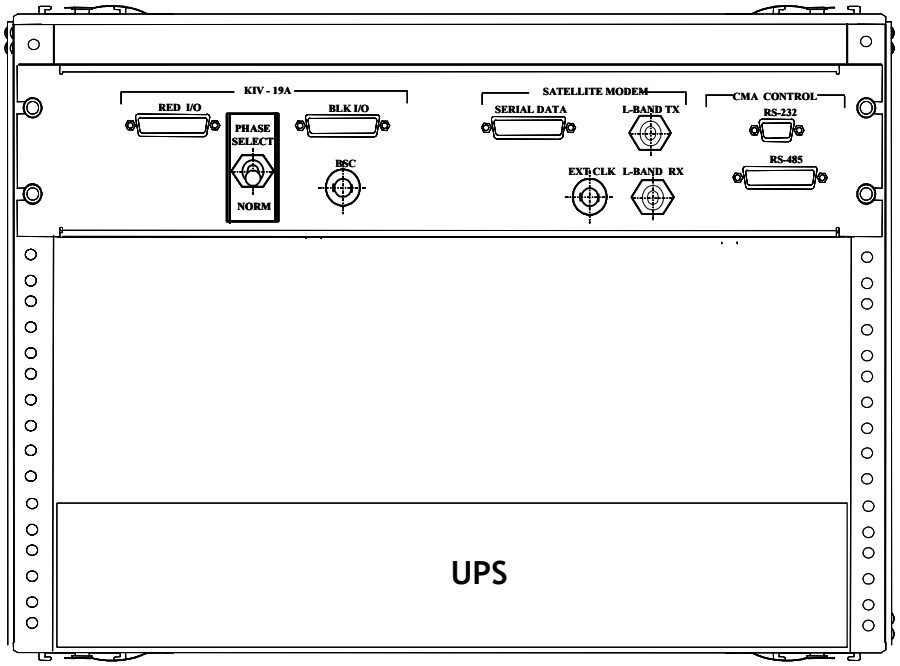

Figure 3 - Rear Elevation

6.3 Cable Diagrams

Table 14 - Cables

Wire Number	Part Number	Manufacturer	Description
(W1) Cable	TBD	TBD	KIV-19A to Red I/O Phase Select
(W2) Cable	TBD	TBD	KIV-19A to Black I/O and BSC
(W3) Cable	TBD	TBD	Modem Serial Data Cable
(W4) Cable	TBD	TBD	Modem Ext Clock Cable
(W5) Cable	TBD	TBD	Modem L-Band Tx Cable
(W6) Cable	TBD	TBD	Modem L-Band Rx Cable
(W7) Cable	TBD	TBD	CMA Control Cable with Adapter
(W8) Cable	TBD	TBD	Modem Power Cable
(W9) Cable	TBD	TBD	KIV-19A Power Cable
(W10) Cable	TBD	TBD	RS-485 Control Cable to DF (Outdoor Electronics)
(P1) Cable (in pouch)	TBD	TBD	CMA Control Cable DB9 Plug to DB9 Jack (10 feet)

Table 14 - Cables

Wire Number	Part Number	Manufacturer	Description
(L1) Cable (in cable bag)	TBD	TBD	RS-485 Control Cable to Outdoor Electronics (100 feet)
(L2, L3) Modem Cable (in cable bag)	TBD	TBD	Inter-moduel Cable, Type N Male-to-Male (straight-through) (100 feet)

6.4 Interconnect Diagram