Flatpack2 48/2000 HE

Rectifier Module

The most efficient rectifier in the industry!

The combination of innovative design, efficiency and reliability makes the Flatpack2 HE stand out. With an efficiency up to 96.5%, the losses have been reduced by 50% compared to the current industry standard.

In a global perspective, considering the high energy consumption in the telecom industry, this technology breakthrough is not only reducing operational cost for the operators, but it can also have a significant environmental impact.

Applications

Wireless, fiber and fixed line communication
Today's communications demand state of the art, cost effective and compact DC power systems. Flatpack2 HE delivers an industry leading power density and superb reliability at lowest lifetime cost.

The HE rectifier also has an extremely high efficiency at low load, which historically has been a drawback with most modern soft switching technologies.

Broadband and network access
Increasing network speed demands flexible and expandable DC power solutions. The Flatpack2 HE rectifiers are your key building blocks for future needs.

Small and large
Due to the high power density, cost competitive design and a highly flexible system communication interface, Flatpack2 HE rectifiers are used in system solutions from 2kW to 192kW.

Product Features and Advantages

Flexibility and reliability
Extensive use of digital controllers has enabled advanced functionality to meet most customers' requirements. It also provides intelligent self-protective features like reduced output power at high temperatures or low mains.

Plug and play
Plug a new rectifier into the system, and it automatically logs on, gets an assigned ID, downloads the system set parameters from the control system and starts up with a minimum of installation time, and without interrupting the system or attached equipment.

The HE rectifier is made fully compliant with the standard Flatpack2 rectifier which means it can be used in any FP2 system solutions, whether it is in new installations, site expansions or replacement programs.

Global compliance
Eltek Valere is among the market leaders in all regions in the world, and designs the core products to be compliant to all relevant standards and customer requirements. All Flatpack2 rectifiers are CE marked, UL recognized and NEBS compliant.

Patents pending
Flatpack2 HE is a result of intensive research over many years. Several unique technical solutions are introduced, protected by patent applications.

See reverse side for specifications

Flatpack2 48/2000 HE

Additional Technical Specifications

AC Input

Voltage	85-300 VAC (Nominal 185 – 275 VAC)
Frequency	45 to 66Hz
Maximum Current	11.6 A_{rms} maximum at nominal input and full load
Power Factor	> 0.99 at 50% load or more
Input Protection	o Varistors for transient protection o Mains fuse in both lines o Disconnect above 300 VAC

DC Output

Voltage	53.5 VDC (adj. range: 43.5-57.6 VDC)
Output Power	2000 W at nominal input
Maximum Current	41.7 Amps at 48 VDC and nominal input
Current Sharing	±5% of maximum current from 10 to 100% load
Static voltage regulation	±0.5% from 10% to 100% load
Dynamic voltage regulation	±5.0% for 10-90% or 90-10% load variation, regulation time < 50ms
Hold up time	> 20ms; output voltage > 43.5 VDC at 1500W load
Ripple and Noise	o < 250 mV peak to peak, o 30 MHz bandwidth o < 2 mV rms psophometric
Output Protection	o Overvoltage shutdown o Hot plug-in - Inrush current limiting o Short circuit proof o High temperature protection

Applicable Standards

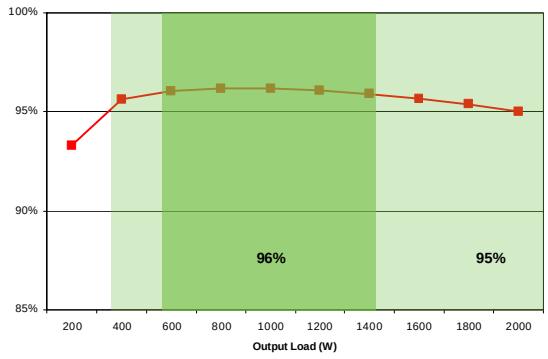
Electrical safety	IEC 60950-1 UL 60950-1 CSA 22.2
EMC	ETSI EN 300 386 V.1.3.2 EN 61000-6-1 (immunity, light industry) EN 61000-6-2 (immunity, industry) EN 61000-6-3 (emission, light industry) EN 61000-6-4 (emission, industry) Telcordia NEBS GR1089 CORE
Mains Harmonics	EN 61000-3-2
Environment	ETSI EN 300 019-2-1 Class 1.2 ETSI EN 300 019-2-2 Class 2.3 ETSI EN 300 019-2-3 Class 3.2 ETSI EN 300 132-2 Telcordia NEBS GR63 CORE Zone 4 RoHS compliant

Specifications are subject to change without notice

Other Specifications

Efficiency	>96% at 30-70% load
Isolation	3.0 KVAC – input and output 1.5 KVAC – input earth 0.5 KVDC – output earth
Alarms:	o Low mains shutdown o High temperature shutdown o Rectifier Failure o Overvoltage shutdown on output o Fan failure o Low voltage alarm at 43.5V o CAN bus failure
Warnings:	o Low temperature shutdown o Rectifier in power derate mode o Remote battery current limit activated o Input voltage out of range, flashing at overvoltage o Loss of CAN communication with control unit, stand alone mode
Visual indications	o Green LED: ON, no faults o Red LED: rectifier failure o Yellow LED : rectifier warning
Operating temp	-40 to +75°C (-40 to +167°F)
Storage temp	-40 to +85°C (-40 to +185°F)
Cooling	Fan (front to back airflow)
Fan Speed	Temperature and current regulated
MTBF	> 350, 000 hours Telcordia SR-332 Issue I, method III (a) ($T_{ambient}$: 25°C)
Acoustic Noise	< 20dBA at nominal input and full load ($T_{ambient}$ <= 25°C) < 56dBA at nominal input and full load ($T_{ambient}$ > 40°C)
Humidity	Operating: 5% to 95% RH non-condensing Storage: 0% to 99% RH non-condensing
Dimensions	109 x 41.5 x 327mm (wxhxd) (4.25 x 1.69 x 13")
Weight	1.950 kg (4.3lbs)

Efficiency



241115.105.DS3 – v8

Ordering Information

Part no.	Description
241115.105	Flatpack2 48/2000 HE

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Trilogy with Smartpack2

DC Power System

Overview

Eltek's Trilogy DC power system, powered by the Flatpack2 line of power modules, brings 300A-600A to applications where space is limited. Use of the highly-efficient and reliable Flatpack2 rectifier, remarkably flexible distribution, and the advanced Smartpack2 controller make for optimal system design and cost-effective deployment.

Trilogy with Smartpack2 Controller, 48V/600A System

TRILOGY WITH SMARTPACK2

DC POWER SYSTEM

Doc 370003.DS3 Issue 1

APPLICATIONS

Eltek's Trilogy system is a high-efficiency power solution with an optimal footprint for 300A to 600A applications where space is limited—both in typical racks and some cabinet installations.

The Trilogy system can power both single-voltage telecommunication infrastructure (such as -48V LTE or +24V legacy TDMA) as well as dual-voltage sites (e.g., where both -48V and +24V equipment coexist). DC-to-DC converters are available for converting 24V to 48V (or vice-versa) within a single Trilogy system.

PRODUCT DESCRIPTION

At only 16" deep, the Trilogy system is designed for use in rack spaces and some cabinets. Both 19" and 23" rack widths are available.

Powered by Flatpack2 HE rectifier modules, typical efficiency exceeds 95% at both 24 Vdc and 48 Vdc output. Flatpack2 DC-to-DC converters can also be added within the same system footprint.

The distribution sections features unique circuit breaker holders that facilitate at-will assignment in the field to one of two output buses. Bulk cable connections are available in the rear of the distribution. All cabling is vertical, further reducing horizontal space demands.

KEY FEATURES

- COMPACT DESIGN
  Small overall dimensions are ideal for both rack and cabinet solutions.
- CONFIGURABLE DISTRIBUTION
  Circuit breakers can be assigned at-will to one of two output busses; bulk output landings are available; and an LVD contactor can be included.
- DIGITAL CONTROLLERS
  The Smartpack2 digital controller system provides comprehensive monitoring and regulation by utilizing a variety of specialized data collection devices.
- HEAT MANAGEMENT
  Flatpack2 modules feature front-to-back airflow and chassis-integrated heat-sinks, supplementing high-efficiency energy conversion with excellent heat management.
- COST-EFFICIENCY
  A true plug-and-play system, the Trilogy system reduces both time-to-install and overall costs.

TRILOGY WITH SMARTPACK2

SMARTPACK2 CONTROLLERS

The Smartpack2 controller system handles plant control and monitoring. A variety of modules are used to collect a large variety of metrics to provide comprehensive system regulation and alarming.

The following three units make up a complete *Smartpack2* control system:

- **Smartpack2 Master** is the master controller and contains the interactive display.
- **Smartpack2 Basic** handles internal data aggregation and housekeeping.
- **I/O Monitor2 (Type 2)** handles external alarm inputs and outputs.

The system can be expanded with additional *Basic* controllers, I/O units and other CAN nodes in the *Smartpack2* family. All control and monitoring devices interconnect via the CAN bus.

A single Smartpack2 Master controller is used for the entire system; it is installed in the distribution door. The Smartpack2 Master controller contains an Ethernet port, which can be connected either directly to a computer or to a network (e.g., an office LAN). The Smartpack2 Basic controller is also mounted to the distribution door. On the left wall of the distribution section is the I/O Monitor2 unit, which provides a total of 6 alarm inputs and 6 alarm output relays.

SMARTPACK2 CONTROL SYSTEM

Smartpack2 Master
(interface unit)

I/O Monitor2
(alarm I/O unit)

Smartpack2 Basic
(data aggregation unit)

SUPPORTED CAN NODES

In addition to the devices discussed above, other CAN nodes are available for use with the Smartpack2 control system:

- **Battery Monitor** contains an internal temperature probe to measure battery temperature. It also has monitor inputs for one shunt and one breaker.
- **Load Monitor** can monitor up to eight shunts and eight fuses. Additional Load Monitors can be ordered to monitor external distribution devices or shunts.
- **CAN Power** provides CAN bus isolation and can be used to supplement the available power in the control system.

TRILOGY WITH SMARTPACK2

FLATPACK2 HE RECTIFIERS AND DC-DC CONVERTERS

Flatpack2 HE Rectifier

Flatpack2 HE rectifiers provide primary output power for the Trilogy systems. There are three module options available, identified by DC voltage and power output:

- 24V/1800W
- 48V/2000W
- 48V/3000W

HE rectifiers feature typical efficiencies higher than 95% (the 48V/2000W module typically performs higher than 96%). See the respective datasheets for more detailed specifications.

Flatpack2 DC-DC converters provide optional, secondary output power for the Trilogy systems. There are two module options available, identified by input voltage range and nominal output voltage:

- 18-75V/24V
- 18-75V/48V

Both Flatpack2 DC-DC converter modules output up to 1350W. Please refer to the datasheet for more detailed specifications.

CONFIGURABLE DISTRIBUTION

The Trilogy distribution section features either 20 or 24 breaker holders (for 19" or 23" systems, respectively) that can be assigned to one of two distribution buses. The ability to assign each breaker holder to a different bus facilitates a variety of output options, including low-voltage disconnects and converter output. Breaker holders are designed for one-pole, bullet-style breakers; kits are available for two-pole and three-pole breakers.

Bulk battery cable landings are available in the rear of the distribution section. The standard configuration features eight landings for two-hole lugs (3/8" studs on 1" centers).

Moveable Breaker Holders

Bulk Battery Landings (Rear)

Up to two distribution sections can be configured for a single Trilogy system. The positions of the hot and return landings are tiered to accommodate the additional cabling.

TRILOGY WITH SMARTPACK2

AC INPUT

Nominal Input Voltage	208/240 Vac
Rated Input Voltage Range	100-250 Vac
AC Connections	Compression terminals

AC-DC SYSTEMS	24 Vdc Systems	48 Vdc Systems
Nominal Voltage	o 24 Vdc	o 48 Vdc
Adjustable Range	o 21.7 – 28.8 Vdc	o 43.2 – 57.6 Vdc
Maximum Power	o 15 kW	o 30 kW
Maximum Current	o 600A	o 600A

DC-DC SYSTEMS	18-75/24 Vdc Systems	18-75/48 Vdc Systems
Nominal Voltage	o 26 Vdc	o 53 Vdc
Adjustable Range	o 24 – 28 Vdc	o 48 – 58.5 Vdc
Maximum Power	o 5.4 kW	o 5.4 kW
Maximum Current	o 224A	o 112A

MONITORING

Monitoring Unit	Smartpack2 control and monitoring devices	
Local Operation	Interactive Display (Smartpack2 Master unit)	
Remote Operation	WebPower (WEB Interface, SNMP protocol and email)	
Alarm Relays	6 x Form-C dry contact relays (NO, NC, C) on I/O Monitor2	
Visual Indications	o Green LED – System ON o Yellow LED – Warnings and Minor alarm(s)	o Red LED – Major alarm(s)
Controller Inputs	6 x multipurpose digital inputs configurable as digital / analog, or temperature measurement (I/O Monitor2)	
Current Measurements	o Battery current	o Rectifier current
Alarms	o Load fuse alarm o Battery fuse alarm o LVD operated o Low output voltage alarms (2 individual alarm levels)	o High output voltage alarms (2 individual alarm levels) o Battery capacity o Temperature alarm o Symmetry alarm and more

DC DISTRIBUTION OPTIONS

Load breakers	Up to 20 positions (19" systems) or 24 positions (23" systems); 0-250A breakers
Battery breakers	Up to 20 positions (19" systems) or 24 positions (23" systems); 0-250A breakers
Dual distribution (option)	Up to 40 positions (19" systems) or 48 positions (23" systems); 0-250A breakers
Bulk battery connections	Up to 8 positions
Programmable LVD	Up to two LVDs per system

CONNECTIONS

Rear battery bulk connections	For two-hole lugs, 3/8" on 1" center
Load connections	For two-hole lugs, ¼" on 5/8 centers. Max. 1 AWG cable.
Alarm connections	Pluggable terminal blocks on I/O monitor, up to 1.5 mm2 [AWG 12]
System mounting	Mid-mount on standard 19" and 23" racks

OTHER SPECIFICATIONS

Operating temperature	-40 to +55°C (-40 to +131°F), de-rates above 46°C (115°F); short-term operation up to 65°C (149°F)
Storage temperature	-40 to +80°C (-40 to +176°F)
Nominal rack sizes	19" / 23"
Maximum depth	16"
Weight (excluding rectifiers)	Approx. 35 kg [77 lbs]

APPLICABLE STANDARDS

Electrical Safety	UL/CSA 60950-1, 2nd edition IEC 60950-1, 2nd edition
EMI/EMC	GR-1089-CORE EN 61000-6-1 EN 61000-6-2 EN 61000-6-3 EN 61000-6-4
Environment	GR-63-CORE

FIAL™ TELECOM MONITORING SOLUTIONS

2314

SNMP Alarm Encoder
Model 2314

- Add SNMPv2 Alarms and Controls to existing IP network
- Configure, control and view local status with a web browser (HTTP & HTTPS)
- Fully compatible with existing LAN/WAN IP networks
- Contact closure, analog threshold and virtual alarms with SNMP traps and tables
- Allows remote control via SNMP sets and via a web browser
- Analog input voltage table with high and low threshold alarms
- 8 Front panel alarm LEDs
- Real time clock with battery backup, Network Time Protocol synchronization

Key Features:

- SNMPv2 Alarm and Control
- Configurable over the IP Network
- Ethernet 10/100baseT Port
- 8 Opto-isolated Alarm Inputs
- 4 Control Outputs (Form C)
- 1 Alarm Summary Output
- 8 Analog Inputs (may be paired for differential)
- Up to 16 Virtual (Boolean) Alarms
- Event Log
- Multiple web logins for admin, control, or view-only
- 48 Volt DC powered

FIAL™ TELECOM MONITORING SOLUTIONS

2314

Model 2314 Characteristics

Ethernet Interface

LAN Port	10/100baseT RJ45 Female
Performance Data	Packets, buffers, comm errors (MIBII)

LED Indicators

Power (green)
Summary alarm (red)
LAN port activity (green and amber)
8 Alarm states (red)

Craft Configuration Port

RJ45	RS-232, 9,600 baud 8/N/1, no flow control

Power

Input Power	48 VDC, floating
Power Consumption	4 to 7 Watts
Power Connection	3 Pin Terminal block (+, -, chassis ground)

Environmental

Operating Temperature	0° to +50° C
Humidity Range	5% to 95%, Non-condensing
Storage Temperature	-40° to +70° C

Physical Characteristics

Shelf Size	1.75" H (1 RU), 19" W, 6" D
Rack Mounting	Flush, or 1 3/4" projection
Shelf Weight	3.5 pounds

Virtual Alarms

16 virtual (Boolean) alarms can be created combining external alarms, control states and analog threshold violations

Alarm Inputs

8, Opto-isolated, 22 kΩ pullups to station battery
Programmable Alarm severities
Programmable alarm delay before assertion

Control Outputs

4 Form C relays, momentary or on/off
1 Alarm summary Form C relay
Relays have 1-Amp DC contacts

Analog Voltages

8 ground-referenced, single-ended inputs (or pair inputs for up to 4 differential inputs)

Alarm/Control/Analog Connector

Industry standard 50-pin female Champ connector with Velcro quick-disconnect retainer, or screw retainer

Optional 25-pair cable and pre-wired 66-block with cover and legend

Fial Incorporated has developed a nationwide reputation for the design of microprocessor-controlled hardware and the development of software for custom applications at a competitive price.

We have been in business since 1978 with one basic objective: to provide functional, cost-effective solutions while maintaining strong communication links with every customer.

Fial Incorporated's products encompass a wide range of telecommunications alarm monitoring equipment and support multiple protocols, including SNMP, TL1, MCS-11, FarScan™, Badger, TBOS, ELMC and others. Our devices include protocol converters, remote encoders, synchronous packet data bridges, baseband and IF protection switch products, and other specialized equipment.

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IXL-101
Alarm and abnormal condition clearing procedures

See Table 101-C to identify alarms reported by the Alarm Manager and the corresponding procedure, which describes how to clear the alarm.

See Table 101-D to identify Abnormal Condition types and the corresponding procedure, which describes how to clear the Abnormal Condition type. The EQUIPMENT column list the entities to which an Abnormal Condition type can apply.

See Table 101-E to identify Core-E card LED alarm indications and the corresponding procedure, which describes how to clear the condition type.

See Table 101-F to identify MSS-1 shelf CORE LED alarm indications and the corresponding procedure, which describes how to clear the condition type.

See Table 101-G to identify Transport card status LED alarm indications and the corresponding procedure, which describes how to clear the condition type.

See Table 101-H to identify Ethernet LED alarm indications and the corresponding procedure, which describes how to clear the condition type.

See Table 101-I to identify MPT-HL Transceiver LED alarm indications and the corresponding procedure, which describes how to clear the condition type.

See Table 101-J to identify TMN Network Trouble conditions and troubleshooting techniques, which describes how to clear the condition type.

This manual supports alarm naming conventions for the Alarm Monitor.

To retrieve alarms using the Alarm Monitor, execute the following sequence from the main menu bar:

Diagnosis>Alarms>NE Alarms

To retrieve Abnormal Conditions using the Craft Terminal, execute the following sequence from the main menu bar:

Diagnosis>Abnormal Condition List

Alarm manager / craft terminal

Equipment / facility column

The EQUIPMENT/FACILITY column in Table 101-C lists the entities to which an alarm type can apply. Depending on the entities affected, some alarm types have more than one corresponding procedure.

In the EQUIPMENT/FACILITY column, equipment entities are listed using the following definitions:

- AUX: Auxiliary card
- Core-E: Core Switching Module card
- FAN: MSS-4/8 Fan card
- MOD300: Radio Modem card
- MPTACC: MPT Access card
- MSS: MSS-1/4/8 shelf
- MPT-HC: MPT-HC/MPT-XP/9558HC (MPT ODU) outdoor unit
- MPT-HL: MPT-HL Transceiver card
- SFP: Small Form Factor Pluggable equipped on listed equipment type
- P2E3DS3: 2-Port DS3 card
- P8ETH: 8-Port Ethernet Access Switch
- P32E1DS1: 32-Port DS1 card
- SDHACC: 2-Port OC-3 card

In the EQUIPMENT/FACILITY column, facility entities are listed using the following definitions:

- Core-E: Ethernet facility supported by the Core-E card
- DS3: DS3 facility supported by P2E3DS3 card
- DS1: DS1 facility supported by P32E1DS1 card
- MOD300: IF facility supported by MOD300 card
- MPT-HC: RF facility supported by MPT-HC/MPT-XP/9558HC (MPT ODU) outdoor unit
- MPT-HL: RF facility supported by MPT-HL Transceiver card
- OC-3: OC-3 facility supported by SDHACC card
- P8ETH: Ethernet facility supported by the P8ETH card

Friendly name / entity column

The FRIENDLY NAME/ENTITY column identifies the location of the alarming entity.

Equipment friendly names are constructed using the following structure:

r<rack number>s<subrack number>b<board number>d<daughter>

The syntax for equipment Friendly Names / Entities is described in Table 101-A.

Table 101-A. Equipment friendly name syntax definitions

Location	Syntax	Values	Description
Rack	r	r01	Rack number
Subrack	s	s1	Subrack number for MSS-1, MSS-4, and MSS-8 shelves
		s[3-8][1-4]	Subrack number for (MPT ODU) connected to MPTACC card (MPTACC slot number and Ethernet port number associated with MPT ODU)
		s[3-8][5-8]	Subrack number for (MPT ODU) connected to P8ETH card (P8ETH slot number and Ethernet port number associated with MPT ODU)
		s1[1-6]	Subrack number for MPT ODU connected to Core-E card or MSS/CORE (Core-E slot number and Ethernet port number associated with MPT ODU)
		s[3-8][5-8]	Subrack number for MPT-HL transceiver connected to P8ETH card (P8ETH slot number and Ethernet port number associated with MPT-HL Transceiver)
		s1[1-6]	Subrack number for MPT-HL Transceiver connected to Core-E card or MSS/CORE (Core-E slot number and Ethernet port number associated with MPT-HL Transceiver)
		s[3-8]	Subrack number for ODU300 connected to MOD300 card (MOD300 slot number associated with ODU300)
Board	b	board#[1-9]	Board/slot number of equipment in alarm
		b#[1-9]	
		Slot#[1-9]	
Daughter	d	daughter#[05-06]	Daughter SFP port number of equipment in alarm associated with Core-E card or MSS/CORE
		daughter#[03-04]	Daughter SFP port number of equipment in alarm associated with MPTACC card
		daughter#[05-08]	Daughter SFP port number of equipment in alarm associated with P8ETH card
		daughter#[01-02]	Daughter SFP port number of equipment in alarm associated with SDHACC card

Radio facility friendly names are constructed using the following structure:

f<facility name>rd<radio direction>b<board number>p<port number>c<channel number>

DS1, DS3, and Ethernet facility friendly names are constructed using the following structure:

f<facility name>b<board number>p<port number>

The syntax for facility Friendly Names / Entities is described in Table 101-B.

Table 101-B. Friendly name syntax definitions

Location	Syntax	Values	Description
Facility Name	f	DS-1-in, out	DS1 facility and direction
		DS-3-in, out	DS3 facility and direction
		EleSdh-in	OC-3 facility and direction (supported by electrical SFP)
		OptSdh-in	OC-3 facility and direction (supported by optical SFP)
		MAU	Ethernet signal
		Radio	Radio facility
Radio Direction	rd	Dir#[3-8].[1-4]	Radio direction of MPT ODU radio channel in alarm connected to MPTACC card (MPTACC slot number and port number)
		Dir#1.[1-6]	Radio direction of MPT ODU radio channel in alarm connected to Core-E card or MSS/CORE (Core-E slot number and port number)
		Dir#[3-8].[5-8]	Radio direction of MPT-HL radio channel in alarm connected to P8ETH card (P8ETH slot number and port number)
		Dir#1.[5-6]	Radio direction of MPT-HL radio channel in alarm connected to Core-E card or MSS/CORE (Core-E slot number and port number)
		Dir#[3-8]	Radio direction of ODU300 radio channel in alarm connected to MOD300 card (MOD300 slot number)
Board	b	board#[1-9]	board/slot number of MSS-8 (1-9), MSS-4 (1-5) equipment in alarm
		b#[1-9]	
		Slot#[1-9]	
		MSS/CORE	board/slot number of MSS-1 equipment in alarm
		MSS/DS1	
Port Number	p	Port#[1-16]	DS1 port number of facility in alarm on MSS-1 shelf
		Port#[1-32]	DS1 port number of facility in alarm on P32E1DS1
		Port#[1-2]	DS3 port number of facility in alarm
		Port#[1-2]	OC-3 port number of facility in alarm
		Port#[1-6]	Ethernet port number of facility in alarm associated with Core-E card or MSS/CORE
		Port#[1-8]	Ethernet port number of facility in alarm associated with P8ETH card

Table 101-B. Friendly name syntax definitions (cont.)

Location	Syntax	Values	Description
Channel Number	c	Ch#1	Main radio channel in alarm
		Ch#0	Spare radio channel in alarm
ERPS	ERP	ERP[1-2]#[1-2]	Ethernet Ring Protection Switch

The following are examples to illustrate how to interpret the probable cause and friendly name combinations:

Example: Probable Cause: Replaceable Unit Missing

- Friendly Name: r01s1/board#8
  - Translation: Missing card at r01 (rack 01) s1 (subrack 1 (MSS-8 Shelf)) /board#8 [missing card provisioned for slot #8]
- Friendly Name: r01s1b3/daughter#05
  - Translation: Missing SFP at r01 (rack 01) s1 (subrack 1 (MSS-8 Shelf)) b3 (card in slot #3 (P8ETH)) /daughter#05 [missing SFP provisioned in slot #3 (P8ETH), SFP port #5]

Example: Probable Cause: Replaceable Unit Type Mismatch

- Friendly Name: r01s1/board#7
  - Translation: Card in r01 (rack 01) s1 (subrack 1 (MSS-8 Shelf)) /board#7 [card installed in slot #7 does not match card configured in Core-E memory]
- Friendly Name: r01subrack#37
  - Translation: Card in r01 (rack 01) subrack 37 [MPT-HL Transceiver 3.7, associated with P8ETH card in slot #3, SFP port #7, does not match MPT-HL Transceiver configured in Core-E memory]

Example: Probable Cause: Loss Of Signal

- Friendly Name: DS1-in/slot#5/Port#22
  - Translation: DS1-input, slot #5, Port #22 [Loss Of incoming DS1 Signal, on P32E1DS1 card in slot #5, port #22]
- Friendly Name: MAU/Slot#4/Port#7
  - Translation: Ethernet signal, slot #4, Port #7 [Loss Of Ethernet Signal on P8ETH card in slot #4, SFP port #7]
- Friendly Name: MAU/Port#2
  - Translation: Ethernet signal, Port #2 [Loss Of Ethernet Signal on the active Core-E card, port #2]

Example: Probable Cause: Loss Of Frame

- Friendly Name: DS3-in/slot#6/Port#2
  - Translation: DS3-input, slot #6, Port #2 [Loss Of DS3 Frame on P2E3DS3 card in slot #6, port #2]
- Friendly Name: Radio/Dir#3.6/Slot#3/Port#6/Ch#1
  - Translation: Radio signal, Direction 3.6, associated with card in slot #3, SFP port #6, Channel #0 [Loss of Frame on MPT-HL Transceiver 3.6 associated with P8ETH card in slot #3, SFP port #6, Channel #0 (main)]
- Friendly Name: Radio/Dir#6/Ch#1
  - Translation: Radio signal, Direction 6, Channel #0 [Loss of Frame on ODU300 #6 channel #0 (spare) associated with MOD300 card in slot #6]

Table 101-C describes the alarms that are reported by the Alarm Manager and the corresponding procedure to clear the alarm.

Table 101-C. Alarm monitor alarm types

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
AIS	DS1-in/MSS/DS1/Port#[1-16]	DS1 on MSS-1 shelf	AIS detected incoming to the PDH card from the demarcation panel for the DS1 or DS3 facility.	TAP-100
	DS1-in/Slot#[3-8]/Port#[1-32]	DS1 on P32E1DS1		
	DS3-in/Slot#[3-8]/Port#[1-2]	DS3		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
AIS	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3	AIS detected incoming to the SDHACC card from the demarcation panel for the OC-3 facility.	TAP-100
	OptSdh-in/slot#[3-8]/Port[1-2]			
AIS	DS1-out/MSS/DS1/Port#[1-16]	DS1 on MSS-1 shelf	AIS detected from the Core-E switch matrix for the DS1 or DS3 facility, indicating an upstream failure.	TAP-100
	DS1-out/Slot#[3-8]/Port#[1-32]	DS1 on P32E1DS1		
	DS3-out/Slot#[3-8]/Port#[1-2]	DS3		
AIS	EleSdh-out/slot#[3-8]/ Port[1-2]	OC-3	AIS detected from the Core-E switch matrix for the OC-3 facility, indicating an upstream failure.	TAP-100
	OptSdh-out/slot#[3-8]/ Port[1-2]			
ATPC loop problem	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	Reported for a ATPC High Power Time-out. When ATPC is enabled, the local transmitter was operating continuously at full power for 5 minutes, and the transmitter was reduced to its minimum power setting and this condition notification was generated. This condition will remain active until a message is received that the active receiver at the other end of the link is no longer requesting additional transmitter power.	TAP-110
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
Bandwidth degrade for protection switch	ERP#[1-2]#[1-2]	Core-E	An ERPS Instance has entered a Protection state.	TAP-105

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Bandwidth over flow	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	While the MPT ODU/ MPT-HL was not communicating with the Core-E, EAS, or MSS/CORE, TDM/SDH cross-connections were provisioned with a total bandwidth which exceeds the net bandwidth capacity of the radio profile.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
Battery failure[1]	r01/subrack#1	MSS-1/4/8	A battery feed failed or is missing.	TAP-102
Cable LOS	Radio/Dir#[3-8]/Ch#[0-1]	MOD300	Bad cable connection at IF in/out connector on MOD300 card.	TAP-111
CLA	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	The standby transmitter has/had a silent failure which caused the far end to request a HSB switch.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Clock failure	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	The MPT ODU/MPT-HL is not able to lock the air Tx symbol rate to the NE clock.	TAP-119
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
Degrade	Sync-in/Port#1	Core-E	Frequency of the source signal is degraded. Managed only if the interface has been configured as a primary or secondary synchronization source.	TAP-109
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#1	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#1	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#1	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Degrade (cont.)	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		TAP-109
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	RadioLAG#[1-14]	MPT ODU connected to P8ETH, MPT-HL connected to P8ETH		
	DS1-in/Slot#[3-8]/Port#[1-32]	P32E1DS1		
	DS1-in/Slot#[3-8]/Port#[1-16]	MSS/DS1		
	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3		
	OptSdh-in/slot#[3-8]/Port[1-2]			
Degrade	RadioLAG#[1-14]	ODU	Signal on the Radio LAG interface is degraded.	TAP-117
Degrade	EthLAG#[1-14]	Core-E, MSS/CORE	A member(s) of an Ethernet or Radio LAG group has no activity. Degrade is declared when the number of active ports in the LAG are greater than zero and less than the LAG size.	TAP-117
	RadioLAG#[1-14]	MPT ODU, MPT-HL, ODU		
DemXPIC LOS	r01s1b1[1-6]/daughter#04	MPT ODU connected to Core-E, MSS/CORE	Bad or missing cable/cable connection at XPIC connector on MPT ODU.	TAP-111
	r01s1/b[3-8][1-4]/daughter#04	MPT ODU connected to MPTACC		
	r01s[3-8][5-8]b1/daughter#04	MPT ODU connected to P8ETH		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Demodulator fail	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Loss of receive signal, bad receive signal, or internal receive circuit failure.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
Dialog failure	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE	Temporary Loss of communication with MPT ODU/MPT-HL	TAP-107
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Duplicate address detected	TMNEthernet/MngtPort	Core-E/TMN MGMT Port	Duplication of IPv6 Global Unicast address detected on TMN management port, Port#4, In-Band port 1-2	TAP-120
	TMNEthernet/Port#4	Core-E/TMN Port#4		
	TMNInBand#[1-2]	Core-E/TMN In-Band Port [1-2]		
Duplicate address detected	PPP-IP/RF#[3-8]	MOD300	Duplication of IPv6 Global Unicast address detected on TMN-RF over PPP	TAP-120
	PPP-IP/RF#1[1-6]	MPT ODU connected to Core-E, MSS/CORE		
	PPP-IP/RF#[3-8][1-4]	MPT ODU connected to MPTACC		
	PPP-IP/RF#[3-8][5-8]	MPT ODU connected to P8ETH		
	PPP-IP/RF#[3-8][5-8]	MPT-HL connected to P8ETH		
	PPP-IP/RF#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	PPP-IP/RF/LAG#[1-14]	MPT ODU, MPT-HL, ODU		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Early warning indication	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	$10E^{-9}$ BER detected	TAP-104
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
Eth OAM loss of continuity	MEP#*MDID*[1-16]#*MA ID* [1-512]#*MEPID*[1-8191]	Core-E, MSS/CORE	MEP received no CCM frames from a peer MEP during an interval equal to 3.5 times the CCM transmission interval configured at the MEP.	TAP-118
Eth OAM MisMerge condition	MEP#MDID[1-16]#MA ID [1-512]#MEPID[1-8191]	Core-E, MSS/CORE	MEP received a CCM frame with correct MD Level but incorrect MA ID.	TAP-118
Eth OAM remote defect indication	MEP#MDID[1-16]#MA ID [1-512]#MEPID[1-8191]	Core-E, MSS/CORE	MEP received a CCM frame with the RDI field set.	TAP-118
Eth OAM unexpected level	MEP#MDID[1-16]#MA ID [1-512]#MEPID[1-8191]	Core-E, MSS/CORE	MEP received a CCM frame with the incorrect MD Level.	TAP-118
Eth OAM unexpectedMEPID	MEP#MDID[1-16]#MA ID [1-512]#MEPID[1-8191]	Core-E, MSS/CORE	Received MEPID value is different than the expected MEPID.	TAP-118

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Eth OAM unexpected period	MEP#MDID[1-16]#MA ID [1-512]#MEPID[1-8191]	Core-E, MSS/CORE	Received MEP Time-Out period value is different than the expected MEP Time-Out period.	TAP-118
Excessive environmental temperature	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH	Excessive temperature on MPT-HL Transceiver	TAP-103
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH	Failure or Missing MPT-HL Transceiver Fan Unit detected	TAP-103
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Firmware Download On Going	r01s1/board#[8]	AUX	Download Status. A download of an FPGA or other software unit on the addressed card.	No action required.
	r01s1/board#[1-2]	Core-E		
	r01s1/MSS/CORE	MSS/Core		
	r01s1/board#[3-8]	MOD300, MPTACC, P2E3DS3, P8ETH, P32E1DS1, SDHACC		
	r01/subrack#[3-8]	ODU300		
	r01/subrack#1[1-6]	MPT ODU connected to Core-E		
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
Flash Card Failure	r01/subrack#1	Core-E, MSS/Core	An indication that the SNMPv3 agent had a failure writing the set-up file to the flash card. Indicates a failed flash card on the Core-E or MSS-1 MSS/CORE.	Call CTAC

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
High BER	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Bit Error Rate threshold ($10E^{-4}$) exceeded on receiver input circuits on MOD300/ MPT ODU/MPT-HL card.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
High BER	EleSdh-in/slot#[3-8]/Port[1-2]	SDHACC (OC-3)	Bit Error Rate threshold ($10E^{-5}$) exceeded on receiver input circuits on SDHACC card from demarcation panel for the OC-3 facility.	TAP-100
	OptSdh-in/slot#[3-8]/Port[1-2]			
High BER	EleSdh-out/slot#[3-8]/ Port[1-2]	SDHACC (OC-3)	Bit Error Rate threshold ($10E^{-5}$) exceeded on transmit output circuits on SDHACC card to the demarcation panel for the OC-3 facility.	TAP-100
	OptSdh-out/slot#[3-8]/ Port[1-2]			
Housekeeping alarm	ExtPt/Input#[1-6]	AUX	Housekeeping alarm input is active.	TAP-116
	ExtPt/Input#[11-14]	Fan		
	ExtPt/Input#[11-14]	MSS-1		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Incompatible frequency	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	Configured frequency is outside of the supported frequency range.	TAP-104
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	ODU300		
Incompatible modulation	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Configured modulation is not supported by MPT ODU.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Incompatible protection	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Incorrectly configured or missing RPS/XPIC module on MPT ODU.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
Incompatible shifter	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Configured shifter value not supported by MPT ODU, MPT-HL, or ODU300.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	ODU300		
Incompatible power	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH	Configured RTPC/ATPC Tx power value or ATPC Rx power threshold value not supported by MPT-HL.	TAP-104
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Incompatible power	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Configured RTPC/ATPC Tx power value or ATPC Rx power threshold value not supported by MPT ODU	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
Incompatible TX power	Radio/Dir#[3-8]/Ch#[0-1]	ODU300	Configured RTPC/ATPC Tx power value or ATPC Rx power threshold value not supported by ODU300.	
Internal communication problem	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE	Loss of communications with MPT ODU, MPT-HL, or ODU300.	TAP-107
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8]	ODU300		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Link identifier mismatch	AirFrame/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#1, AirFrame/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]	MPT ODU connected to MPTACC	Link identifier number provisioned on MOD300/ MPT ODU/MPT-HL card settings screen is different from link identifier number provisioned at far end of hop.	TAP-104
	AirFrame/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#1, AirFrame/Dir#1.[1-6]/ Slot#1/Port#[1-6]	MPT ODU connected to Core-E		
	AirFrame/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#1, AirFrame/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]	MPT ODU connected to MSS/CORE		
	AirFrame/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	AirFrame/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1, AirFrame/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]	MPT-HL connected to P8ETH		
	AirFrame/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	AirFrame/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	AirFrame/Dir#[3-8]/Ch#1, AirFrame/Dir#[3-8]	MOD300		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Loop problem	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	Loss of ATPC command path between far end transmitter and local receiver.	TAP-110
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
Loss of alignment	Hitless/Dir#[3-8].[1-4]	MPT ODU connected to MPTACC	Delay/loss of alignment between main and protect RPS RF paths detected.	TAP-112
	Hitless/Dir#1.[1-6]	MPT ODU connected to Core-E, MSS/CORE		
	Hitless/Dir#[3-8].[5-8]	MPT-HL connected to P8ETH		
	Hitless/Dir#[3-8]	MOD300		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Loss Ethernet synchronization messaging channel	MAU/Slot#[1-2]/Port#[1-6]	Core-E, MSS/CORE	Reported if there is a loss of the Ethernet Synchronization Message Channel. The alarm is applicable to Core-E Ethernet ports and Radio interfaces (MPT ODU, MPT-HL, or MOD300) configured with SSM support enabled and is assigned as a synchronous clock source input.	TAP-109
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
	RadioLAG#[1-14]	MPT ODU, MPT-HL		
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
Loss Of CESoETH frame	CircuitTDM/MSS/DS1/ Port#[1-16]	DS1 on MSS-1 shelf	Packets are not being received by the DS1, DS3, or OC-3 emulation circuits on the receive circuits from the switch matrix.	TAP-100
	CircuitTDM/Slot#[3-8]/ Port#[1-32]	DS1 on P32E1DS1		
	CircuitTDM/Slot#[3-8]/ Port#[1-2]	DS3		
	CircuitTDM/Slot#[3-8]/ Port#[1-2]	OC-3		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Loss Of Frame	DS1-in/MSS/DS1/Port#[1-16]	DS1 on MSS-1 shelf	Loss of DS1, DS3, or OC-3 frame detected incoming to the PDH/SDH card from the demarcation panel for the DS1, DS3, or OC-3 facility.	TAP-100
	DS1-in/Slot#[3-8]/Port#[1-32]	DS1 on P32E1DS1		
	DS3-in/Slot#[3-8]/Port#[1-2]	DS3		
	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3		
	OptSdh-in/slot#[3-8]/Port[1-2]			
Loss of frame	DS1-out/MSS/DS1/ Port#[1-16]	DS1 on MSS-1 shelf	Loss of DS1, DS3, or OC-3 frame detected from the Core-E switch matrix for the DS1, DS3, or OC-3 facility	TAP-100
	DS1-out/Slot#[3-8]/ Port#[1-32]	DS1 on P32E1DS1		
	DS3-out/Slot#[3-8]/Port#[1-2]	DS3		
	EleSdh-out/slot#[3-8]/ Port[1-2]	OC-3		
	OptSdh-out/slot#[3-8]/ Port[1-2]			
Loss of frame	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E	Far end TX problems, RF path problems, or local circuit failures have caused BER to increase to the point that frames are being lost.	TAP-113
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Loss of protection	Radio/Dir#[3-8]/Ch#1	MOD300	The radio direction is affected by a failure that radio protection (RPS) can't recover. Only reported if RPS is provisioned.	TAP-104
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#1	MPT ODU connected to MPTACC		
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#1	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#1	MPT ODU connected to MSS/CORE		
Loss of signal	DS1-in/MSS/DS1/Port#[1-16]	DS1 on MSS-1 shelf	No DS1, DS3, or OC-3 input signal detected.	TAP-100
	DS1-in/Slot#[3-8]/Port#[1-32]	DS1 on P32E1DS1		
	DS3-in/Slot#[3-8]/Port#[1-2]	DS3		
	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3		
	OptSdh-in/slot#[3-8]/Port[1-2]			
Loss of signal	TMNEthernet/MngtPort	Core-E/TMN MGMT Port	Loss of Signal is declared when either: • no Ethernet input signal detected on the Ethernet port • a communication problem with the remote peer (i.e. a link down condition)	TAP-105
	TMNEthernet/MngtPort#4	Core-E/TMN Port#4		
	MAU/Slot#[1-2]/Port#[1-6]	Core-E		
	MAU/MSS/CORE/Port#[1-6]	MSS/CORE		
	MAU/Slot#[3-8]/Port#[1-4]	MPTACC		
	MAU/Slot#[3-8]/Port#[1-8]	P8ETH		
Loss of signal	r01s1[1-6]b1/daughter#03	RPS SFP on MPT ODU connected to Core-E, MSS/CORE	Loss of Signal detected on an MPT ODU/MPT-HL Ethernet Coupler Port. Only reported when RPS is provisioned.	TAP-104
	r01s1[3-8][1-4]b1/ daughter#03	MPT ODU connected to MPTACC		
	MAU/subrack[#3-8].[5-8] Port#n	MPT-HL connected to P8ETH		
Loss of signal	Sync-in/Port#1	Core-E	Generated when no signal is present on the incoming Sync-In port.	TAP-109

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Loss of signal	EthLAG#[1-14]	Core-E, MSS/CORE	ALL members of an Ethernet or Radio LAG group have no activity. Loss of Signal is declared when the number of active ports in the LAG equals zero.	TAP-117
	RadioLAG#[1-14]	MPT ODU, MPT-HL, ODU		
Power supply failure	r01/subrack#[3-8][1-4]	MPTACC	MPT Power Supply Failure detected, either an Open-Circuit or Over-Current condition on a MPTACC or MSS-1 shelf (PFoE) power supply port 1 or 2.	TAP-102
	r01/subrack#1[1-2]	MSS/Core		
PPP fail	PPP-IP/RF#1[1-6]	MPT ODU connected to Core-E, MSS/CORE	TMN over PPP Fail	TAP-104
	PPP-IP/RF#[3-8][1-4]	MPT ODU connected to MPTACC		
	PPP-IP/RF#[3-8][5-8]	MPT ODU connected to P8ETH		
	PPP-IP/RF#[3-8][5-8]	MPT-HL connected to P8ETH		
	PPP-IP/RF#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	PPP-IP/RF#[3-8]	MOD300		
Provisioning mismatch	r01s1/board#[1-2]	Core-E	The wrong flash card is installed and the current database is in conflict with the license string on the card.	TAP-106
	r01s1/board#1	MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Remote defect indication	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#[0-1]	MPT ODU connected to MPTACC	Remote Defect Indication (RDI) in a received Radio Direction. Alarm is reported when an RDI is received on a given radio direction from the remote end of radio link.	TAP-104
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#[0-1]	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#[0-1]	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#[0-1]	MPT-HL connected to P8ETH		
	Radio/Dir#1.[5-6]/ Slot#1/Port#[5-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[5-6]/MSS/ CORE/Port#[5-6]/Ch#1	MPT-HL connected to MSS/CORE		
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
Remote defect indication	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3	Remote Defect Indication (RDI) in a received OC-3 Direction. Alarm is reported when an RDI is received on a given OC-3 direction from the remote end of OC-3 link.	TAP-100
	OptSdh-in/slot#[3-8]/Port[1-2]			

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Replaceable unit missing	r01s1/board#[8]	AUX	Card/SFP is missing from slot (Only declared, if the card/SFP has been provisioned. Card/SFP could be unreachable.).	TAP-103
	r01s1/board#[1-2]	Core-E		
	r01s1/board#[5,9]	FAN		
	r01s1/board#[3-8]	MOD300, MPTACC, P2E3DS3, P8ETH, P32E1DS1, SDHACC		
	r01s1b[1-2]/daughter#[5-6]	SFP on Core-E		
	r01s1b1/daughter#[5-6]	SFP on MSS/CORE		
	r01s1b[3-8]/daughter#[03-04]	SFP on MPTACC		
	r01s1b[3-8]/daughter#[05-08]	SFP on P8ETH		
	r01s1b[3-8]/daughter#[01-02]	SFP on SDHACC		
	r01s[3-8][1-4]b1/daughter#03	RPS SFP on MPT ODU connected to MPTACC		
	r01s1[1-6]b1/daughter#03	RPS SFP on MPT ODU connected to Core-E, MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Replaceable unit problem	r01s1/board#[8]	AUX	Card failed.	TAP-103
	r01s1/board#[1-2]	Core-E		
	r01s1/MSS/CORE	MSS-1		
	r01s1/board#[5,9]	FAN		
	r01s1/board#[3-8]	MOD300, MPTACC, P2E3DS3, P8ETH, P32E1DS1, SDHACC		
	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE		
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8]	ODU300		
	r01s1b[1-2]/daughter#[05-06]	SFP on Core-E		
	r01s1b1/daughter#[05-06]	SFP on MSS/CORE		
	r01s1b[3-8]/daughter#[03-04]	SFP on MPTACC		
	r01s1b[3-8]/daughter#[05-08]	SFP on P8ETH		
	r01s1b[3-8]/daughter#[01-02]	SFP on SDHACC		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Replaceable unit problem (cont.)	r01s[3-8][1-4]b1/daughter#03	RPS SFP on MPT ODU connected to MPTACC	Card failed.	TAP-103
	r01s1[1-6]b1/daughter#03	RPS SFP on MPT ODU connected to Core-E, MSS/CORE		
	r01s1[1-6]b1/daughter#04	RPS or XPIC Module on MPT ODU connected to Core-E, MSS/CORE		
	r01/subrack#[3-8][5-8]/ daughter#04	XPIC Module on MPT ODU connected to P8ETH		
	r01s[3-8][1-4]b1/daughter#04	RPS or XPIC Module on MPT ODU connected to MPTACC		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Replaceable unit type mismatch	r01s1/board#[8]	AUX	Card/ODU in slot does not match card/ODU configured in Core-E memory	TAP-103
	r01s1/board#[1-2]	Core-E		
	r01s1/board#[5,9]	FAN		
	r01s1/board#[3-8]	MOD300, MPTACC, P2E3DS3, P8ETH, P32E1DS1, SDHACC		
	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE		
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8]	ODU300		
RPS path fail	RadioProt/Dir#[3-8][1-4]	MPT ODU connected to MPTACC	A communication failure is detected between MPT ODUs. Only reported for an MPT ODUs working in 1+1 configuration with Virtual Protection.	TAP-114
	RadioProt/Dir#1[1-6]	MPT ODU connected to Core-E, MSS/CORE		
	RadioProt/Dir#[3-8][5-8]	MPT-HL connected to P8ETH	Communication failure is detected between RPS coupler port between radio boards. Only reported if RPS is provisioned.	

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Rx fail	Radio/Dir#[3-8]/Ch#[0-1]	ODU300	Failure in receive direction of ODU300 RF transceiver. Includes no input signal.	TAP-115
Secondary battery failure[1]	r01/subrack#1	MSS-1/4/8	B battery feed failed or is missing.	TAP-102
Standby version mismatch	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE	Standby software version on MPT ODU/MPT-HL does not match software version on Core-E.	TAP-106
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Synchronization signal fail	Sync-in/Port#1	Core-E	Synchronization Signal Fail is reported if the received source signal is not suitable as a Sync Source. Managed only if the interface has been configured as a primary or secondary synchronization source.	TAP-109
	Radio/Dir#[3-8]/Ch#[0-1]	MOD300		
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#1	MPT ODU connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#1	MPT ODU connected to MSS/CORE		
	Radio/Dir#[3-8].[1-4]/ Slot#[3-8]/Port#[1-4]/Ch#1	MPT ODU connected to MPTACC		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT ODU connected to P8ETH		
	Radio/Dir#[3-8].[5-8]/ Slot#[3-8]/Port#[5-8]/Ch#1	MPT-HL connected to P8ETH		
	Radio/Dir#1.[1-6]/ Slot#1/Port#[1-6]/Ch#1	MPT-HL connected to Core-E		
	Radio/Dir#1.[1-6]/MSS/ CORE/Port#[1-6]/Ch#1	MPT-HL connected to MSS/CORE		
	RadioLAG#[1-14]	MPT ODU, MPT-HL		
	DS1-in/Slot#[3-8]/Port#[1-32]	DS1 on P32E1DS1		
	DS1-in/MSS/DS1/Port#[1-16]	DS1 on MSS-1 shelf		
	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3		
	OptSdh-in/slot#[3-8]/Port[1-2]			

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Threshold crossed	Hop/Dir#1[1-6]/Slot#1/ Port#[1-6]/Ch#[0-1]-PM15min	MPT ODU connected to Core-E	Threshold Crossing Alarm (TCA) indicates alarm threshold has been exceeded. Applies to performance monitor parameters with an accumulation period of 24 hours and 15 minutes.	TAP-108
	Hop/Dir#1[1-6]/Slot#1/ Port#[1-6]/Ch#[0-1]-PM1day			
	Link/Dir#1[1-6]-PM15min			
	Link/Dir#1[1-6]-PM1day			
	Hop/Dir#1[1-6]/MSS/CORE/ Port#[1-6]/Ch#[0-1]-PM15min	MPT ODU connected to MSS/CORE		
	Hop/Dir#1[1-6]/MSS/CORE/ Port#[1-6]/Ch#[0-1]-PM1day			
	Link/Dir#1[1-6]-PM15min			
	Link/Dir#1[1-6]-PM1day			
	Hop/Dir#[3-8][1-4]/Slot#[3-8]/ Port#[1-4]/Ch#[0-1]-PM15min	MPT ODU connected to MPTACC		
	Hop/Dir#[3-8][1-4]/Slot#[3-8]/ Port#[1-4]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8][1-4]-PM15min			
	Link/Dir#[3-8][1-4]-PM1day			
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#1-PM15min	MPT ODU connected to P8ETH		
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#1-PM1day			
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#[0-1]-PM15min	MPT-HL connected to P8ETH		
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8][5-8]-PM15min			
	Link/Dir#[3-8][5-8]-PM1day			
	Hop/Dir#1[5-6]/Slot#1/ Port#[5-6]/Ch#1-PM15min	MPT-HL connected to Core-E		
	Hop/Dir#1[5-6]/Slot#1/ Port#[5-6]/Ch#1-PM1day			
	Hop/Dir#1[5-6]/MSS/CORE/ Port#[5-6]/Ch#1-PM15min	MPT-HL connected to MSS/CORE		
	Hop/Dir#1[5-6]/MSS/CORE/ Port#[5-6]/Ch#1-PM1day			

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Threshold crossed (cont.)	Hop/Dir#[3-8]/Ch#[0-1]-PM15min	MOD300	Threshold Crossing Alarm (TCA) indicates alarm threshold has been exceeded. Applies to performance monitor parameters with an accumulation period of 24 hours and 15 minutes.	TAP-108
	Hop/Dir#[3-8]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8]-PM15min			
	Link/Dir#[3-8]-PM1day			
	DS1-in/Slot#[3-8]/ Port#[1-32]-PM15min	P32E1DS1		
	DS1-in/Slot#[3-8]/ Port#[1-32]-PM1day			
	DS1-out/Slot#[3-8]/ Port#[1-32]-PM15min			
	DS1-out/Slot#[3-8]/ Port#[1-32]-PM1day			
	DS1-in/MSS/DS1/ Port#[1-16]-PM15min	DS1 on MSS-1 shelf		
	DS1-in/MSS/DS1/ Port#[1-16]-PM1day			
	DS1-out/MSS/DS1/ Port#[1-16]-PM15min			
	DS1-out/MSS/DS1/ Port#[1-16]-PM1day			
Trace identifier mismatch	EleSdh-in/slot#[3-8]/Port[1-2]	OC-3	Trace Identifier Mismatch condition indicates there is a J0 Trace Mismatch detected in the incoming signal from the demarcation panel.	TAP-100
	OptSdh-in/slot#[3-8]/Port[1-2]			

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Unavailable time	Hop/Dir#1[1-6]/Slot#1/ Port#[1-6]/Ch#[0-1]-PM15min	MPT ODU connected to Core-E	A period of unavailable time begins when 10 consecutive SES events are detected. Alarms are associated to the performance monitoring port.	TAP-108
	Hop/Dir#1[1-6]/Slot#1/ Port#[1-6]/Ch#[0-1]-PM1day			
	Link/Dir#1[1-6]-PM15min			
	Link/Dir#1[1-6]-PM1day			
	Hop/Dir#1[1-6]/MSS/CORE/ Port#[1-6]/Ch#[0-1]-PM15min	MPT ODU connected to MSS/CORE		
	Hop/Dir#1[1-6]/MSS/CORE/ Port#[1-6]/Ch#[0-1]-PM1day			
	Link/Dir#1[1-6]-PM15min			
	Link/Dir#1[1-6]-PM1day			
	Hop/Dir#[3-8][1-4]/Slot#[3-8]/ Port#[1-4]/Ch#[0-1]-PM15min	MPT ODU connected to MPTACC		
	Hop/Dir#[3-8][1-4]/Slot#[3-8]/ Port#[1-4]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8][1-4]-PM15min			
	Link/Dir#[3-8][1-4]-PM1day			
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#1-PM15min	MPT ODU connected to P8ETH		
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#1-PM1day			
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#[0-1]-PM15min	MPT-HL connected to P8ETH		
	Hop/Dir#[3-8][5-8]/Slot#[3-8]/ Port#[5-8]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8][5-8]-PM15min			
	Link/Dir#[3-8][5-8]-PM1day			
	Hop/Dir#1[5-6]/Slot#1/ Port#[5-6]/Ch#1-PM15min	MPT-HL connected to Core-E		
	Hop/Dir#1[5-6]/Slot#1/ Port#[5-6]/Ch#1-PM1day			
	Hop/Dir#1[5-6]/MSS/CORE/ Port#[5-6]/Ch#1-PM15min	MPT-HL connected to MSS/CORE		
	Hop/Dir#1[5-6]/MSS/CORE/ Port#[5-6]/Ch#1-PM1day			

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Unavailable time (cont.)	Hop/Dir#[3-8]/Ch#[0-1]-PM15min	MOD300	A period of unavailable time begins when 10 consecutive SES events are detected. Alarms are associated to the performance monitoring port.	TAP-108
	Hop/Dir#[3-8]/Ch#[0-1]-PM1day			
	Link/Dir#[3-8]-PM15min			
	Link/Dir#[3-8]-PM1day			
	DS1-in/Slot#[3-8]/Port#[1-32]-PM15min	P32E1DS1		
	DS1-in/Slot#[3-8]/Port#[1-32]-PM1day			
	DS1-out/Slot#[3-8]/Port#[1-32]-PM15min			
	DS1-out/Slot#[3-8]/Port#[1-32]-PM1day			
	DS1-in/MSS/DS1/Port#[1-16]-PM15min	DS1 on MSS-1 shelf		
	DS1-in/MSS/DS1/Port#[1-16]-PM1day			
	DS1-out/MSS/DS1/Port#[1-16]-PM15min			
	DS1-out/MSS/DS1/Port#[1-16]-PM1day			
Unconfigured equipment present	r01s1/board#[8]	AUX	Card in MSS shelf slot 2 through 8 is not provisioned (enabled) but is present in slot. SFP is not provisioned (enabled) but is present in card.	TAP-103
	r01s1/board#[2]	Core-E		
	r01s1/board#[5,9]	FAN		
	r01s1/board#[3-8]	MOD300, MPTACC, P2E3DS3, P8ETH, P32E1DS1, SDHACC		
	r01s1b[1-2]/daughter#[05-06]	SFP on Core-E		
	r01s1b1/daughter#[05-06]	SFP on MSS/CORE		
	r01s1b[3-8]/daughter#[03-04]	SFP on MPTACC		

Table 101-C. Alarm monitor alarm types (cont.)

Probable cause	Friendly name/entity	Facility/ equipment	Description	See
Unconfigured equipment present (cont.)	r01s1b[3-8]/daughter#[05-08]	SFP on P8ETH	Card in MSS shelf slot 2 through 8 is not provisioned (enabled) but is present in slot. SFP is not provisioned (enabled) but is present in card.	TAP-103
	r01s1b[3-8]/daughter#[01-02]	SFP on SDHACC		
Version mismatch	r01/subrack#1[1-6]	MPT ODU connected to Core-E, MSS/CORE	Software version on ODU, MPT ODU/MPT-HL does not match software version on Core-E.	TAP-106
	r01/subrack#[3-8][1-4]	MPT ODU connected to MPTACC		
	r01/subrack#[3-8][5-8]	MPT ODU connected to P8ETH		
	r01/subrack#[3-8][5-8]	MPT-HL connected to P8ETH		
	r01/subrack#1[5-6]	MPT-HL connected to Core-E, MSS/CORE		
	r01/subrack#[3-8]	ODU300		
	r01s1/board#[1-2]	Core-E		
	r01s1/MSS/CORE	Core on MSS-1 shelf		

[1] For MSS-1 applications, In the very specific case where it happens simultaneously that: a) The negative polarity is connected to ground. b) The voltage value of the line corresponding to the fuse opened is lower than the value of the voltage line in service, the battery failure and secondary battery failure alarm may not be properly reported by JUSM and Alarm Monitor.

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Core facing PDH loopback	DS1 Port#[1-16] Internal	Loopback DS1 on MSS-1 shelf	The associated entity has a core facing PDH (DS1 or DS3) loopback activated at the near end.	TAP-101
	DS1 Port#[1-32] Internal	Loopback SLOT#[3-8]		
	DS3 Port#[1-2] Internal			
Core facing SDH loopback	OC3 Port#[1-2] Internal	Loopback SLOT#[3-8]	The associated entity has a core facing SDH (OC3) loopback activated at the near end.	TAP-101
Digital core facing loopback	Direction #1.[1-6]	Loopback (MPT ODU connected to Core-E, MSS/CORE)	The associated entity has a loopback activated at the near end.	TAP-101
	Direction #[3-8].[1-4]	Loopback (MPT ODU connected to MPTACC)		
	Direction #[3-8].[5-8]	Loopback (MPT ODU connected to P8ETH)		
	Direction #[3-8].[5-8]	Loopback (MPT-HL connected to P8ETH)		
	Direction #1.[5-6]	Loopback (MPT-HL connected to Core-E, MSS/CORE)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Forced adaptive modulation	Direction #[3-8]	Radio (MOD300)	Manual Adaptive Modulation command has been executed.	TAP-101
	Direction #1.[1-6]	Radio (MPT ODU connected to Core-E, MSS/CORE)		
	Direction #[3-8].[1-4]	Radio (MPT ODU connected to MPTACC)		
	Direction #[3-8].[5-8]	Radio (MPT ODU connected to P8ETH)		
	Direction #[3-8].[5-8] - Channel #[0-1]	Radio (MPT-HL connected to P8ETH)		
	Direction #1.[5-6]	Loopback (MPT-HL connected to Core-E, MSS/CORE)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Forced switch EPS	Main#1 Slot#1	Equipment Protection (Core-E)	A Forced Equipment Protection Switch (EPS) has been executed for the protection group.	TAP-101
	Main#1 Slot#[3,5,7]	Equipment Protection (MOD300, P2E3DS3, P32E1DS1, SDHACC)		
	Main#1 Slot #[3-8] Port #[1-4]	Equipment Protection (MPT ODU connected to MPTACC)		
	Main#1 Slot #1 Port #[1,3,5]	Equipment Protection (MPT ODU connected to Core-E)		
	Main#1 MSS/CORE Port #[1,3,5]	Equipment Protection (MPT ODU connected to MSS/CORE)		
	Main#1 Slot #[3,5,7] Port #[5-8]	Equipment Protection (MPT-HL connected to P8ETH)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Forced switch RPS	Main#1 Slot#[3,5,7]	Rx Radio Protection (MOD300)	A Forced Rx Protection Switch (RPS) has been executed for the protection group.	TAP-101
	Main#1 Slot #[3-8] Port #[1-4]	Rx Radio Protection (MPT ODU connected to MPTACC)		
	Main#1 Slot #1 Port #[1,3,5]	Rx Radio Protection (MPT ODU connected to Core-E)		
	Main#1 MSS/CORE Port #[1,3,5]	Rx Radio Protection (MPT ODU connected to MSS/CORE)		
	Main#1 Slot #[3,5,7] Port #[5-8]	Rx Radio Protection (MPT-HL connected to P8ETH)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Forced switch TPS	Main#1 Slot#[3,5,7]	HSB Protection (MOD300)	A Forced Tx Protection Switch (TPS) has been executed for the protection group.	TAP-101
	Main#1 Slot #[3-8] Port #[1-4]	HSB Protection (MPT ODU connected to MPTACC)		
	Main#1 Slot #1 Port #[1,3,5]	HSB Protection (MPT ODU connected to Core-E)		
	Main#1 MSS/CORE Port #[1,3,5]	HSB Protection (MPT ODU connected to MSS/CORE)		
	Main#1 Slot #[3,5,7] Port #[5-8]	HSB Protection (MPT-HL connected to P8ETH)		
IF cable loopback	Direction #[3-8]	Loopback (MOD300)	The associated entity has a loopback activated at the near end.	TAP-101

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Line facing circuit loopback	Direction #1.[1-6]	Loopback (MPT ODU connected to Core-E, MSS/CORE)	The associated entity has a loopback activated at the near end.	TAP-101
	Direction #[3-8].[1-4]	Loopback (MPT ODU connected to MPTACC)		
	Direction #[3-8].[5-8]	Loopback (MPT ODU connected to P8ETH)		
	Direction #[3-8].[5-8]	Loopback (MPT-HL connected to P8ETH)		
	Direction #1.[5-6]	Loopback (MPT-HL connected to Core-E, MSS/CORE)		
Line facing PDH loopback	DS1 Port#[1-16] External	Loopback DS1 on MSS-1 shelf	The associated entity has a line facing PDH (DS1 or DS3) loopback activated at the near end.	TAP-101
	DS1 Port#[1-32] External	Loopback SLOT#[3-8]		
	DS3 Port#[1-2] External			
Line facing SDH loopback	OC3 Port#[1-2] External	Loopback SLOT#[3-8]	The associated entity has a line facing PDH (OC3) loopback activated at the near end.	TAP-101

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Lockout switch EPS	Spare#0 Slot#2	Equipment Protection (Core-E)	A Lockout Equipment Protection Switch (EPS) has been executed for the protection group.	TAP-101
	Spare#0 Slot#[4,6,8]	Equipment Protection (MOD300, P2E3DS3, P32E1DS1, SDHACC)		
	Spare#0 Slot#[3-8] Port #[1-4]	Equipment Protection (MPT ODU connected to MPTACC)		
	Spare#0 Slot #1 Port #[2,4,6]	Equipment Protection (MPT ODU connected to Core-E)		
	Spare#0 MSS/CORE Port #[2,4,6]	Equipment Protection (MPT ODU connected to MSS/CORE)		
	Spare#0 Slot#[4,6,8] Port #[5-8]	Equipment Protection (MPT-HL connected to P8ETH)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Lockout switch RPS	Spare#0 Slot#[4,6,8]	Rx Radio Protection (MOD300)	A Lockout Rx Protection Switch (RPS) has been executed for the protection group.	TAP-101
	Spare#0 Slot#[3-8] Port #[1-4]	Rx Radio Protection (MPT ODU connected to MPTACC)		
	Spare#0 Slot #1 Port #[2,4,6]	Rx Radio Protection (MPT ODU connected to Core-E)		
	Spare#0 MSS/CORE Port #[2,4,6]	Rx Radio Protection (MPT ODU connected to MSS/CORE)		
	Spare#0 Slot#[4,6,8] Port #[5-8]	Rx Radio Protection (MPT-HL connected to P8ETH)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
Lockout switch TPS	Spare#0 Slot#[4,6,8]	HSB Protection (MOD300)	A Lockout Tx Protection Switch (TPS) has been executed for the protection group.	TAP-101
	Spare#0 Slot#[3-8] Port #[1-4]	HSB Protection (MPT ODU connected to MPTACC)		
	Spare#0 Slot #1 Port #[2,4,6]	HSB Protection (MPT ODU connected to Core-E)		
	Spare#0 MSS/CORE Port #[2,4,6]	HSB Protection (MPT ODU connected to MSS/CORE)		
	Spare#0 Slot#[4,6,8] Port #[5-8]	HSB Protection (MPT-HL connected to P8ETH)		

Table 101-D. Abnormal condition

Operation	Name	Type (equipment)	Description	See
TXMute	Direction #1.[1-6] - Channel #[0-1]	Radio (MPT ODU connected to Core-E, MSS/CORE)	Manual or automatic mute command has been executed.	TAP-101
	Direction #[3-8].[1-4] - Channel #[0-1]	Radio (MPT ODU connected to MPTACC		
	Direction #[3-8].[5-8] - Channel #1	Radio (MPT ODU connected to P8ETH		
	Direction #[3-8].[5-8] - Channel #[0-1]	Radio (MPT-HL connected to P8ETH)		
	Direction #1.[5-6] - Channel #1	Radio (MPT-HL connected to Core-E, MSS/CORE)		
	Direction #[3-8] - Channel #[0-1]	Radio (ODU300)		

Table 101-E. Core-E Card LED indications

LED	Indication	Probable cause	Corrective action
Status	OFF	Card Not Provisioned	Provision card
		Not Powered	Verify MSS-4/8 shelf fuse is not blown or missing. Verify Power cable(s) are properly terminated at both ends. Verify voltage level at the PDU.
		Not Equipped	Verify the card is properly installed.
	Green Blinking	Configuration Downloading, SW Booting, or flash card realignment.	Wait for configuration download or software boot to complete.
	Green	Card Properly Equipped and Provisioned. currently In-Service/Active.	Normal Operating condition. No Action required.
	Yellow	Card Properly Equipped and Provisioned as EPS. Currently in Standby.	Normal operating condition for Standby card. No Action required.
	Red	Card Fail	Replace card
	Red Blinking	Card Mismatch	Check alarms for replaceable unit type mismatch, see TAP-103.
Major Alarm	Red	At least one alarm with Critical or Major severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Minor Alarm	Red	At least one alarm with Minor severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Warning	Yellow	At least one alarm with Warning severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Abnormal	Yellow	At least one abnormal condition present in the NE.	Retrieve abnormal condition using JSUM, see IXL-101 Table 101-D, and troubleshoot accordingly.

Table 101-F. MSS-1 shelf LED indications

LED	Indication	Probable cause	Corrective action
Status	OFF	MSS-1 shelf not Provisioned	Provision MSS-1 shelf.
		MSS-1 shelf not Powered	Verify MSS-1 shelf fuse is not blown or missing. Verify Power cable(s) are properly terminated at both ends. Verify voltage level at the PDU.
		MSS-1 shelf not Equipped	Verify the MSS-1 shelf is properly installed.
	Green Blinking	Configuration Downloading, SW Booting.	Wait for configuration download or software boot to complete.
	Green	MSS-1 shelf Properly Equipped and Provisioned. currently In-Service.	Normal Operating condition. No Action required.
	Red	MSS-1 shelf Fail	Replace MSS-1 shelf
Major Alarm	Red	At least one alarm with Critical or Major severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Minor Alarm	Red	At least one alarm with Minor severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Warning	Yellow	At least one alarm with Warning severity present in the NE.	Retrieve alarms using the alarm monitor, see IXL-101 Table 101-C, and troubleshoot accordingly.
Abnormal	Yellow	At least one abnormal condition present in the NE.	Retrieve abnormal condition using JSUM, see IXL-101 Table 101-D, and troubleshoot accordingly.
PFoE	Yellow	Port is emitting power according to the configuration.	
	OFF	Port is emitting power according to the configuration.	

Table 101-G. Transport Card LED indications

LED	Indication	Probable cause	Corrective action
Status	OFF	Card Not Provisioned	Provision card
		Not Powered	Verify MSS-4/8 shelf fuse is not blown or missing. Verify Power cable(s) are properly terminated at both ends. Verify voltage level at the PDU.
		Not Equipped	Verify the card is properly installed.
	Green Blinking	Configuration Downloading, SW Booting, or flash card realignment.	Wait for configuration download or software boot to complete.
	Green	Card Properly Equipped and Provisioned. currently In-Service/Active.	Normal Operating condition. No Action required.
	Yellow	Card Properly Equipped and Provisioned as EPS. Currently in Standby.	Normal operating condition for Standby card. No Action required.
	Red	Card Fail	Replace card
	Red Blinking	Card Mismatch	Check alarms for replaceable unit type mismatch, see TAP-103.

Table 101-H. Ethernet LED indications

LED	Indication	Description	Probable cause	Corrective action
ETH Link	Green LED Not Lit	Loss of Ethernet communication with link partner.	1. Cable between link partner and Ethernet port is disconnected/ broken.	Connect/repair cable.
			2. Speed/Mode provisioning mismatch between link partner and Ethernet port.	1. Check local Ethernet provisioning screen. 2. Check link partner provisioning.

Table 101-I. MPT-HL transceiver LED alarm indications

LED	Indication	Probable cause	Corrective action
Status	OFF	Card Not Provisioned	Provision card
		Not Powered	Verify MPT-HL Transceiver fuse is not blown or missing. Verify Power cable is properly terminated at both ends. Verify voltage level at the PDU.
		Invalid Configuration	Verify configuration provisioning and correct as required.
	Green Blinking	Configuration Downloading, or SW Booting. (Different blink rates should be used to identify each step of the startup process.)	Wait for configuration download or software boot to complete.
	Green	Card Properly Equipped and Provisioned. EPS or RPS currently In-Service/Active.	Normal Operating condition. No Action required.
	Yellow	Card Properly Equipped and Provisioned. EPS and RPS currently in Standby.	Normal operating condition for Standby MPT-HL Transceiver. No Action required.
	Green/Red Blinking	Card Properly Equipped and Provisioned. Either TX or RX equipment or signal Fault. EPS or RPS currently In-Service/Active. Traffic is probable affected.	
		Equipment problem at either near end or far end:	1. Check alarms. 2. Check abnormal conditions. 3. Check protection schemes.
		Path related problem:	1. Check RSL levels 2. Check equipment alarms. 3. Verify no weather related issue.
		PA switch at the far end is set to OFF ,0™ position:	1. Verify PA switch position at far end and set to ON ,1™ position.
	Yellow/Red Blinking	Card Properly Equipped and Provisioned, TX or RX signal Fault, EPS and RPS currently in Standby. Traffic maybe affected:	
		Equipment problem at either near end or far end:	1. Check alarms. 2. Check abnormal conditions. 3. Check protection schemes.
		Path related problem:	1. Check RSL levels 2. Check equipment alarms. 3. Verify no weather related issue.

Table 101-I. MPT-HL transceiver LED alarm indications (cont.)

LED	Indication	Probable cause	Corrective action
Status (cont.)	Red	Card Fail	Replace MPT-HL Transceiver
	Red Blinking	MAP Communication Time-out: Communication between the MPT-HL Transceiver and the P8ETH cards is lost.	Check alarms for Internal Communication Problem, if present, see TAP-107.
Power Emission	Green LED ON	MPT-HL Transceiver is emitting power as expected according to the known configuration.	No Action required
	Green LED Blinking	MPT-HL Transceiver is not emitting power due to a forced squelch condition. Most probable causes:	
		1. TX mute active	Release TX mute
		2. PA switch is positioned Off	Position PA switch to On position
	Green LED OFF	MPT-HL Transceiver is not emitting power for reasons other than fforced squelchf.	
		1. Transmit Protection Switch (TPS) is currently in standby state.	Verify MPT-HL Transceiver should be in standby state.
		2. Software booting or FPGA download in progress	Wait for software booting or FPGA download to complete

Table 101-J. TMN network troubleshooting

Problem	Possible Cause	Possible Solution
Unusually slow communication in radio network	1. Normal network management traffic is saturating the communications channel. 2. Polling radios for PM data or missed alarms too rapidly 3. Multiple remote software downloads in process 4. IP traffic other than network management traffic being routed through radio network	1. There may be too many radios being managed within a single region. Split the radio network management into different regions and backhaul the traffic for each region through separate channels. 2. Poll the radios more slowly. 3. Download to fewer radios at a time. 4. Configure external routers to allow only network management related traffic through the Management network of the radios. Dynamic route updates (OSPF, RIP) may attempt to reroute high speed traffic through the TMN network if a high speed ink fails.

Table 101-J. TMN network troubleshooting (cont.)

Problem	Possible Cause	Possible Solution
Unable to operate controls using SNMP	To perform control operations, the Manager must be registered as a craft device.	Register the Manager as a craft device. Manager registration type can be changed as needed to type ‚ct™ to allow control operation and then be changed back to ‚nml™ for normal operation.
Can Read SNMP objects but cannot Write to SNMP objects	1. Incorrect community string 2. If the TMN Interface is configured for SNMPv2, the write community string is probably wrong.	1. Use the correct community string. 2. Use the correct write community string.
No traps being received from NE	1. Manager not registered in NE to receive traps 2. Communication failure in network 3. Traps are blocked by firewall	1. Register Manager with NE. 2. Check network connectivity. Check redundant network paths and routing. Traceroute (tracert) is useful for locating path or routing faults. 3. Check firewall provisioning to allow trap UDP ports.
Unable to communicate with the NE through the radio network (unable to ‚ping™ the NE).	1. Possible communication path failure or routing failure within the radio network. 2. Incorrect IP address on the PC.	1. Use traceroute (tracert) to help locate for communication path or routing problems. 2. Verify PC IP address, subnet, and default route.
Can ‚ping™ the TMN Interface but cannot communicate with the NE using SNMP, or can only see a few SNMP objects in the NE.	1. If using SNMPv2, using the wrong community string, username, or passphrase. 2. Manager not registered or properly registered with the NE. The objects visible to an unregistered manager are generally: the 'system' MIB, a few objects under 'tsdimSnmpNEMibObject', the 'opticsIMMgrPollingInfoTable', the 'snmpUsmMib', and 'snmpVacmMib' objects.	1. Verify community string, username, and passphrase. 2. Verify Manager registration with the NE and register or correct registration.

IXL-102
Support procedures

Table 102-A lists the support procedures that are needed to perform maintenance and trouble clearing on the system.

For more information about operation and administration, see the 9500 MPR-A Operation and Administration Manual (PN 3EM23954AN).

Table 102-A. Support procedures

Support procedure	See
Alarm and event reports, Retrieve	Operation and Administration manual
Clean fiber-optic connectors	DLP-112
Clock reference and operation mode selections	Operation and Administration manual
Log into system	Operation and Administration manual
Loopback (Core Facing)	Operation and Administration manual
Manage cross-connections	Operation and Administration manual
MIB Database Management (Backup and Restore)	Operation and Administration manual
Password change	Operation and Administration manual
Performance monitoring	Operation and Administration manual
Protection switching controls	Operation and Administration manual
Provision equipment	Operation and Administration manual
Provision or edit ports	Operation and Administration manual
Preventive maintenance procedures	RTL-100
Protection upgrade and downgrade procedures	DLP-117
Resolve WebEML/TCO Suite/NEtO startup issues	DLP-129
Software package rollback	DLP-127
System power down and power up	DLP-113
Upgrade and downgrade radio profile	DLP-118
Upgrade unlicensed MPT-HL radio to lower 6 GHz radio	DLP-119

ALCATEL-LUCENT 5620 SERVICE AWARE MANAGER
RELEASE 12

The Alcatel-Lucent 5620 Service Aware Manager (SAM) takes service providers well beyond the traditional boundaries of element, network and service management. The 5620 SAM enables end-to-end management of the all-IP network to help service providers quickly gain the efficiencies they need to beat the competition.

The 5620 SAM maximizes operational efficiency network-wide across the domains of Alcatel-Lucent IP and IP-integrated optical networks from access to metro to core – and in wireless LTE networks from RAN to backhaul to packet core. Fast and easy provisioning reduces time to market and increases flexibility when launching new services. Proactive troubleshooting helps resolve problems before they affect customers, and ease of integration within the existing operational environment helps service providers get the most from their investments.

Network management and Operations Support System (OSS) mediation capabilities provided by the 5620 SAM can be categorized into the following focus areas: Infrastructure Management, Infrastructure Assurance, Service Management and Service Assurance.

Tightly integrated within the 5620 SAM, the **Alcatel-Lucent 5650 Control Plane Assurance Manager (CPAM)** enables proactive assurance by delivering unprecedented visibility into the dynamic multivendor IP/MPLS routing plane and services. Augmenting the 5620 SAM with **custom service portals** and **pre-certified OSS partner application integrations** speeds deployment and further enhances the fit into even the most complex networks.

Independently proven to deliver quick and continuing return on investment, the 5620 SAM is deployed in the networks of more than 600 service providers, including some of the world's largest and most advanced networks for mobile, residential, enterprise and converged services.

DELIVERING UNMATCHED OPERATIONAL EFFICIENCY
END TO END ACROSS THE ALL-IP NETWORK

FEATURES	BENEFITS
Easy-to-use GUI and templates accelerate maintenance tasks	Minimized time and costs associated with the errors that commonly occur when a command-line interface (CLI) is used
Deployment automation for network upgrades, configuration, provisioning and performance validation through flexible scripting options and rules-based triggers	Rapid introduction of new services and technologies that meet SLAs
Common provisioning for different service types [Layer 2 and Carrier Ethernet, WDM and optical transport network (OTN), Layer 3 MPLS VPNs and MPLS-TE]	Reduced cost of delivering multi-technology composite services by minimizing the risk of misconfigurations
Efficient collection of network statistics, OA&M diagnostics and state KPIs for service level agreement (SLA) monitoring, including at-a-glance dashboards	Proactive prevention of potential service-affecting problems before they impact customers
Powerful fault correlation and advanced troubleshooting visualization that help to quickly pinpoint the root cause of problems to speed resolution	Simplified problem isolation to quickly understand services-impact, diagnose problems and resolve them
Open interfaces that enable integration with custom web portals, OSSs and Business Support Systems (BSSs)	Increased productivity and flexibility with a management solution that easily adapts to allow cost-effective integration into the existing operational environment, enhancing workflows and processes

INFRASTRUCTURE MANAGEMENT

Alcatel-Lucent 5620 SAM network infrastructure management provides base FCAPS management with many advanced extensions. It accelerates configuration of network infrastructure by providing easy-to-use forms, as well as scripting to automate parameter configuration. External systems are able to access infrastructure management functionality through an open OSS interface. (See Table 1 for feature summary.)

More efficiency through service-aware model

The 5620 SAM service-aware management model maps relationships between services to network infrastructure across the multiple underlying technology layers of the all-IP network that services delivery depends on. This model enables many infrastructure management tasks to be performed more efficiently. For example, infrastructure provisioning, maintenance and audits can be performed in bulk across a multitude of network elements. In addition, the model delivers an effective top-down approach to troubleshooting, which enables more rapid problem isolation to pin-point issues before they impact services.

Automated deployment and management

The advanced 5620 SAM scripting framework enables programmatic control to automate deployment of infrastructure, significantly reducing misconfigurations so services can be delivered faster and more reliably. Automation eliminates the need to individually configure each device in the service path – including everything from network and quality of service (QoS) policy configuration, to device operating system upgrades and provisioning for even the most complex end-to-end services spanning multiple technology domains.

After deployment, automated setup of comprehensive OA&M diagnostics suites can be used to valid that performance requirements and SLAs are met. For ongoing day-to-day operations, network auditing and reporting as well as bulk maintenance changes can also be automated. Scripts can be triggered by events (for example, after the discovery of a network element), scheduled or run on-demand. Control scripts can also use rules-driven logic to run other scripts.

OSS integrations may maximize efficiency by triggering 5620 SAM scripts for pre-processing. External applications listening to events through the 5620 SAM OSS interface may trigger scripts based on events. (See Figure 1.)

Figure 1. Automation through 5620 SAM scripts

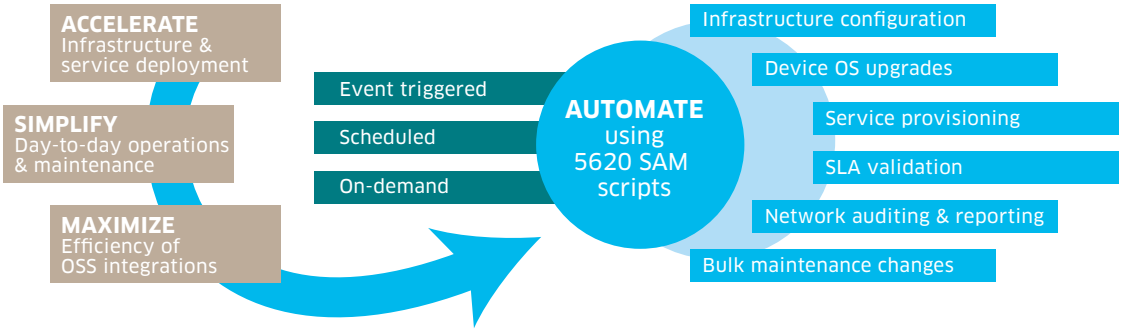


Table 1. Alcatel-Lucent 5620 SAM network infrastructure deployment, maintenance and management feature summary

CATEGORY	FEATURES
Network discovery and inventory	• Subnet-based auto-discovery of in-band and out-of-band network elements • Real-time synchronization with network element changes • Configurable MIB polling policies and schedules – for accounting statistics or OA&M tests, for example • Highly scalable alarm and SNMP statistics collection • Network inventory hierarchy views and equipment views
Configuration and maintenance	• GUI-based configuration with concurrent, multiple object editing • Step-by-step form entry to simplify complex tasks and user-entry fields to add additional guidance • Device configuration, including for physical and logical resources, buffers, queuing and QoS marking/forwarding • Routing domain management including Interior Gateway Protocol (IGP) and Border Gateway Protocol (BGP) • Automated setup for IEEE 802.1ag/ITU-T Y.1731 standards-based Ethernet OA&M and MEF 35 service OA&M performance monitoring • Rules-based backup, restore, upgrade of device software • Network configuration and policy audits to detect differences from a golden or device-specific configuration • Script management with control script logic-driven workflow execution • GUI builder to design customized forms and selection menus to set parameters for scripts
Infrastructure provisioning	• Rules-based bulk parameter configuration and auto-creation of objects, such as tunnels • Network service distribution point (SDP) provisioning • MPLS label-switched path (LSP) provisioning with automatic bidirectional, meshed SDP binding creation during service creation • Post-discovery control scripts to automate deployment and management for any managed devices. (See Figure 1.) • Third-party device provisioning using CLI scripts with security and version control
OSS interface	• Open north-bound interface enables external applications to integrate with full access to 5620 SAM managed infrastructure data

INFRASTRUCTURE ASSURANCE

Alcatel-Lucent 5620 SAM network infrastructure assurance provides comprehensive physical and logical network topology views, as well as infrastructure fault correlation, alarm management, OA&M test-suites and integrated route analytics. (See Table 2 for feature summary.)

View of all physical, routing, MPLS, service infrastructure layers

A variety of views and icon status indicators help to quickly diagnose and resolve service-affecting problems, from simple to complex. Service tunnel and physical topology maps allow visualization of all network resources. The integrated 5650 CPAM enables visualization and highlighting of Layer 2 and Layer 3 services on an IGP topology.

Advanced troubleshooting

Enabled by a sophisticated correlation and rules engine, advanced fault management visualization allows better sight into the magnitude and impact of faults within massive volumes of assurance data to help eliminate manual troubleshooting.

At-a-glance, network-wide distribution views, grouping correlated alarms to independent problems, help to determine which fault to investigate first by giving an understanding of which problems have the largest magnitude of impact. Problems can easily be isolated through clear views that show the root-cause of a fault, including an impact tree of correlated faults.

Fault impact network hierarchy views give an understanding of affected infrastructure, and provide simple, more efficient cross-navigation workflows to configuration forms to accelerate problem resolution.

(See Figure 2.)

Figure 2. Advanced fault management visualization

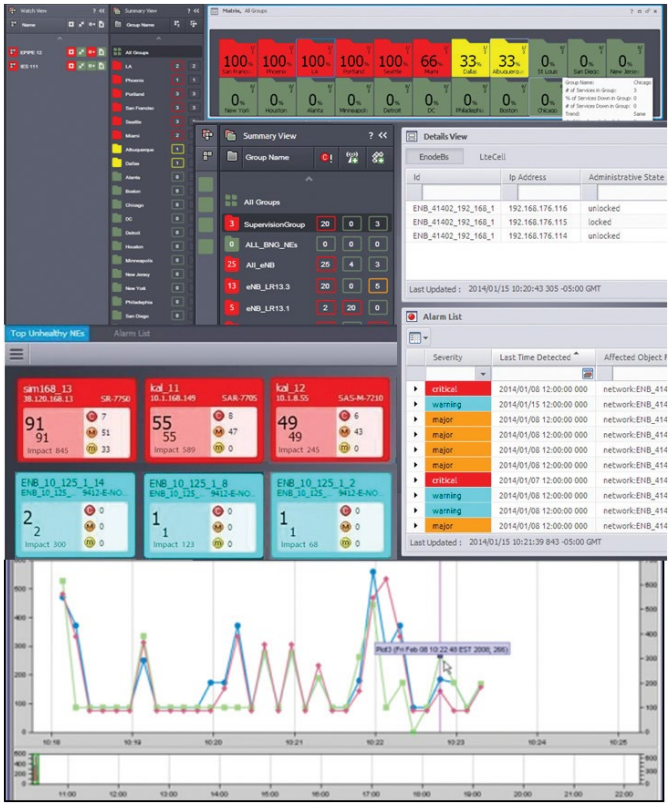
Health and performance supervision

Highly scalable collection of real-time and historical statistics (such as for equipment and interfaces) provides comprehensive information needed to detect and troubleshoot performance issues.

OA&M test suites can be scheduled and compared to configurable parameters – such as jitter, delay and packet-loss metrics – to proactively detect network and service degradation. Rules-based alarm notifications, such as threshold-crossing alerts and escalating test failure alerts, further automate assurance and adherence to SLAs.

Infrastructure-specific fault summary views and supervision dashboards enable operators to see fault trends, KPIs and other summary health indicators that enable proactive monitoring at-a-glance. (See Figure 3.)

Figure 3. Infrastructure health and performance supervision



Power management dashboards for specific device types provide summary views into power consumption totals and utilization trends for individual network elements or zones.

Custom applications for SLA reporting

Alcatel-Lucent network management services offer turn-key development of custom 5620 SAM web apps, such as for SLA reporting. Based on the 5620 SAM web apps framework, custom apps can be developed quickly and cost effectively to address specific process and workflow requirements, resulting in more operational flexibility.

Network auditing

Automate network auditing and perform mass validation of configuration and policies distributed across many network elements against a common “golden” configuration or policy. Use managed CLI scripting to compare configuration on third-party devices. For example, comparison tools may be used after changing device OS release versions to ensure that the previous configuration remains the same.

Alcatel-Lucent network management services also offer custom scripting development and expert hands-on training on 5620 SAM scripting.

Table 2. Alcatel-Lucent 5620 SAM network infrastructure assurance feature summary

CATEGORY	FEATURES
Topology maps	• Physical topologies that support IEEE 802.1ab link adjacencies • IGP/BGP routing, MPLS, and multicast topologies through integrated 5650 CPAM • Topology overlays provide fault status and additional troubleshooting information, such as port and link utilization statistics, or OA&M test results with trace highlighting after point-and-click execution from a map
Alarm lists	• Multiple instances of alarm windows with custom filters • Direct navigation from alarms to affected and related objects • Extensive alarm filtering and search capabilities (including advanced logical constraint-based filtering through web GUI) • Customizable alarm information fields, including user-entry text fields • Flexible definition of rules for fault escalation, de-escalation and severity assignment
Advanced fault management visualization	• At-a-glance fault summary dashboards to view top unhealthy network elements with status KPIs and drill down to detailed alarms • Advanced fault visualization delivers an understanding of which faults to investigate first • Alarm correlation through rules engine to identify root cause of problem from symptoms • Network-wide distribution views grouping correlated alarms make magnitude of problem impact clear • Root-cause alarm impact tree visualization to easily navigate to root-cause or related alarms in tree • Top problem views enable a quick view of problem volume distribution based on alarm type • Network element investigation views allow easy access to device-specific configuration and alarm details • Network infrastructure hierarchy visualization for fault impact also provides cross-navigation to forms for further investigation • Web-based GUI for wider accessibility
Accounting and performance statistics collection	• Distributed, load-balanced statistics collection for accounting and performance data • Real-time and historical statistics retention and graphing
Infrastructure health and performance supervision	• Real-time and historical statistics to detect and troubleshoot performance issues • On-demand OA&M test tools to gain performance metrics such as latency, delay and packet loss • Proactive assurance with scheduled OA&M test suites to continually assess performance across various technology layers • Automatically generated OA&M tests based on object or topology changes • Set threshold-crossing alerts for specific KPIs to notify operators immediately of emerging issues • Web-based domain-specific dashboards to summarize network health at-a-glance: ¬ Infrastructure supervision with network element health status and KPIs ¬ Power consumption totals and utilization trends per network element or zone • Custom 5620 SAM web applications for SLA reporting developed by Alcatel-Lucent network management services
Network management integrated route analytics (5650 CPAM)	• Multivendor control plane visualization to detect and rapidly resolve routing issues • Tracking of changes from baseline configuration and topologies to current state • Auditing of IP/MPLS configuration and routing policy deviations from saved snapshot points • Path and prefix health and troubleshooting views • Auto-triggered OA&M testing and alarms on routing changes • Offline simulation tools to reduce risk of unexpected routing behavior after planned network updates • Management and troubleshooting for multicast and 1588v2 PTP synchronization
OSS interface	• Open north-bound interface enables external applications to integrate with full access to 5620 SAM alarm, statistics and OA&M data

Assurance and management of third-party devices

5620 SAM Generic Network Element (GNE) support enables integration and discovery of third-party equipment for topology display, alarm surveillance (with MIB trap-to-alarm mapping), and statistics collection (interface MIB). Third-party support is also enabled for configuration and script management with deployment audits and validation.

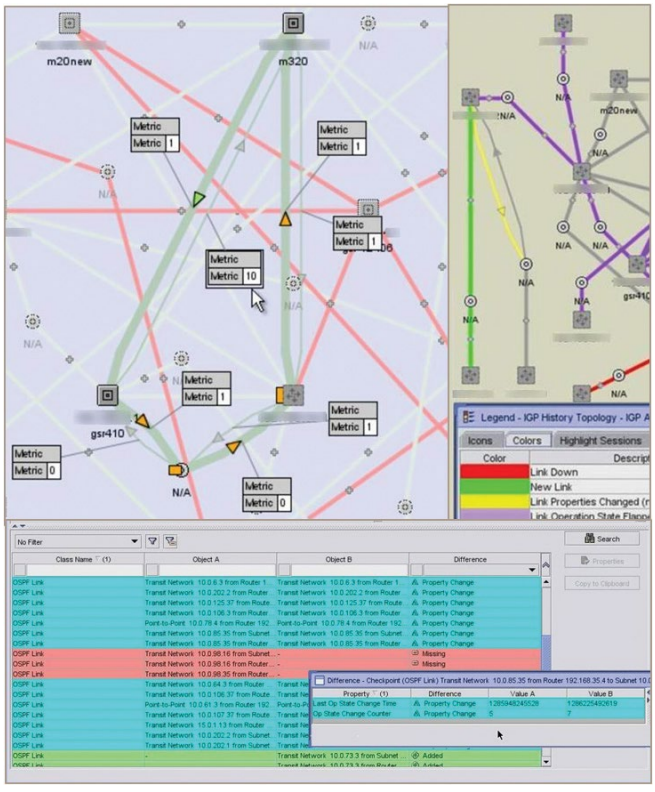
The Alcatel-Lucent 5650 CPAM provides multivendor route analytics that inherently supports third-party IP routing devices.

Route analytics

The **Alcatel-Lucent 5650 CPAM** is tightly integrated within the Alcatel-Lucent 5620 SAM to deliver a seamless multivendor route and path analytics within the Alcatel-Lucent Service Aware Management assurance offering. Together, they help to proactively assure the network and isolate potential problems before they affect services. The 5650 CPAM provides simplified control plane management through its real-time and historical visualization, troubleshooting, and analysis. With 5650 CPAM unprecedented end-to-end IP/MPLS infrastructure visibility and analysis enable an understanding of how the control plane topology and protocol changes impact IP routing, MPLS paths, service infrastructure and services. (For examples of 5620 SAM integrated route analytics, see Figure 4.)

The 5650 CPAM provides health monitoring for IGP (OSPF and IS-IS) and MPLS paths as well as BGP and IP-VPN prefixes that tracks change history, event statistics and reporting for impact analysis. It also automates path and service tunnel OA&M testing on IP or MPLS path changes to alert operators when performance issues emerge after re-routes occur. Protocol configuration audits combine IP/MPLS protocol configuration data from the 5620 SAM with 5650 CPAM change history tracking information to enable detection of misconfigurations. Offline simulation tools enable planned changes to be validated before being made in the live network and reduce the risk of maintenance or upgrades impacting performance due to unexpected routing behavior. The 5650 CPAM also provides management and troubleshooting for multicast as well as for 1588v2 PTP synchronization.

Figure 4. Control plane assurance with the 5650 CPAM



The 5650 CPAM uses 5620 SAM servers, databases and its OSS interface, making it a low-cost, low-risk investment. The two products share common user interface components for ease of use, a consistent operator experience and reduced training costs. The single north-bound API enables operators to complement traffic engineering and capacity planning applications with route analytics efficiently with the benefits of reduced OSS integration costs and lower deployment risks.

SERVICE MANAGEMENT

Alcatel-Lucent 5620 SAM service management maximizes efficiency of service operations network-wide across the domains of the all-IP network. It accelerates service deployment with service templates and scripts for provisioning, rules-based QoS and accounting policy assignment, and automated SLA validation. External systems are able to access service management functionality through an open OSS interface. (See Table 3 for feature summary.)

Flexible provisioning options

Templates and workflows enable point-and-click service creation. Operators are guided step-by-step as they set up complex services for rapid provisioning and fewer errors. Templates also enable operators to customize and standardize their provisioning workflow to match internal processes. Layer 2 and Layer 3 services are provisioned in the same way, reducing delivery costs for different service types.

Provisioning verification

Newly activated services can be validated using a service test suite. Tests are automatically extended as services expand so test coverage does not drop off over time. Individual component tests for the newly provisioned entity are automatically created and include detailed test results.

Service accounting

The 5620 SAM collects accounting statistics to meet a wide range of billing requirements. Setup is accelerated by per-service accounting policy assignment that controls statistics collection for related service access ports. Third-party billing systems can also benefit from aggregated accounting statistics that are grouped per service, since it simplifies integration effort through using the 5620 SAM OSS interface.

Automated service deployment

The advanced 5620 SAM scripting framework enables programmatic control to automate service provisioning and accelerate time-to-market for new services. Everything can be automated from service creation to QoS policy assignment to service accounting policy setup for even the most complex end-to-end services spanning multiple technology domains. After deployment, setup of service test suites can be automated so that SLAs are continuously monitored. (See Figure 1 for more details on automation through 5620 SAM scripts.)

Services management

Services management provide a centralized view for listing services, performing maintenance and troubleshooting, including search filters, status indicators, and cross-navigation to configuration forms and topology maps for each corresponding service.

Table 3. Alcatel-Lucent 5620 SAM services deployment, maintenance and management feature summary

CATEGORY	FEATURES
Rapid service creation	• GUI-based service provisioning with concurrent, multiple object editing • Step-by-step form entry using service templates simplifies complex tasks with reduced user-entry fields • Network SDP provisioning • Rules-based auto-creation of service tunnels • Per-service policies on services to control statistics collection for billing requirements • Post-discovery control scripts to automate deployment and management for any managed devices (See Figure 1) • Third-party device provisioning using CLI scripts with security and version control
Provisioning and service deployment validation	• Single-click service validation through auto-generated OA&M tests • Per-service network policy audits • Scripting-based service deployment audits and SLA validation
Services management support	• Layer 2 Ethernet (VPLS, VPWS/VLL), Layer 3 IP-VPN, dynamic VPN (RADIUS policy auto-provisioned) and subscriber services • Composite services that combine multiple services into a unified managed service • Service connection admission control (CAC) to automate tunnel selection based on tracked bandwidth bookings
Cross-domain services management support	• IP-integrated optical transport services with WaveTracker power monitoring and light path tracing for DWDM and OTN, including for Layer 0 OCh or OTU, Layer 1 ODU and Layer 2 EPL or EVPL • IP-integrated Ethernet packet-based microwave services and 1588v2 PTP synchronization services • Data center dynamic virtualized services and SDN management for Nuage Networks, including for VXLAN, EVPN and SD-VPN
OSS interface	• Open north-bound interface enables external applications to integrate with full access to 5620 SAM managed services data

SERVICE ASSURANCE

The Alcatel-Lucent 5620 SAM delivers comprehensive service assurance from continuous SLA, performance and health monitoring, service topology visualization, and service impact fault visualization, as well as advanced service-to-infrastructure correlated troubleshooting. (See Table 4 for feature summary.)

Service topologies

Service topologies help operators to proactively detect and troubleshoot service-affecting problems, from simple to complex. The 5620 SAM provides visualization for both Layer 2 and 3 service topologies, and IP/MPLS integrated optical transport services. Composite services can be created to enable better end-to-end service assurance for more complex service architectures that combine multiple service technologies. OA&M diagnostics may also be enabled to allow SLA validation right from the service topology map using service tests with views of result summaries.

Together, the 5620 SAM and 5650 CPAM deliver multi-layer visualization and topology overlays to enable operators to see how services are tied to multiple network infrastructure layers.

SLA monitoring and service test management

Extensive collection of service performance statistics and comprehensive SLA monitoring tools let operators verify services end to end as well as individual service segments. Service test suites can simultaneously test every aspect of a group of services, including multi-layer OA&M validation of service infrastructure performance. Test suites can also be set up to provide continual scrutiny of KPIs across various technology layers. In addition, performance monitoring thresholds set on activating OA&M test suites and statistics counters enable operators to be alerted as issues emerge.

Third-party service performance management OSS integrations benefit from highly scalable statistics collection enabled through the 5620 SAM OSS interface.

Service supervision

At-a-glance dashboards for services and service group monitoring provide web-based summaries and detailed supervisory views for monitoring service health using fault trends and KPIs.

Root-cause and service-impact analysis

The 5620 SAM allows operators to quickly pin-point the root-cause of a problem and determine which customers are affected through sophisticated visual insight. This service impact visualization is made possible through a comprehensive service-aware infrastructure model and an advanced alarm correlation engine that ties network infrastructure events to impacted services.

Service correlation rules combined with advanced fault management visualization enable easy service impact assessment of faults to help identify priority for investigation and accelerate troubleshooting. At-a-glance network-wide alarm distribution views give an understanding of problems with the most services impact. Problem diagnosis is simplified through clear views that show the root-cause of a fault, including an impact tree of correlated faults. (See Figure 2 for examples of advanced fault management visualization.)

Third-party fault management OSS integrations, enabled through the 5620 SAM OSS interface, also benefit from configurable alarm suppression capabilities.

Table 4. Alcatel-Lucent 5620 SAM service assurance feature summary

CATEGORY	FEATURES
Topology maps	• Service topologies give fault status view of underlying network infrastructure involved in the delivery of a service • Service topologies give an end-to-end service view for composite services that tie together multiple cross-technology segments • Topology overlays provide fault status and additional troubleshooting information, such as performance statistics, or OA&M test results with trace highlighting after point-and-click execution from a map
Service supervision	• At-a-glance web-based dashboards for services and service group monitoring • High-level summaries and detailed supervisory views for monitoring service health using fault trends and KPIs
SLA monitoring and Service Test Manager (STM)	• OA&M and Service Assurance Agent (SAA) test validation of end-to-end services and underlying network layers • Proactive monitoring with scheduled OA&M test suites to continually assess performance across various technology layers • Service infrastructure performance statistics provide additional service KPIs • Threshold-crossing alerts triggered on out-of-bound KPIs notify operators immediately of emerging issues before SLAs are violated • Tightly integrated with 5650 CPAM for: ¬ Monitoring health of high-priority service paths and prefixes ¬ Auto-triggered service infrastructure testing and alarms on routing changes
Root-cause and service impact analysis	• Advanced alarm visualization delivers an understanding of which problems impact the most services • Alarm correlation through rules engine to identify root cause of problem from symptoms • Root-cause alarm impact tree visualization to easily navigate to root-cause or related infrastructure and service alarms in tree • Service infrastructure hierarchy views show impacting alarms and provide cross-navigation to specific forms for further investigation • Web-based GUI for wider accessibility
OSS interface	• Open interface enables external applications to integrate with full access to 5620 SAM service assurance and accounting data

PLATFORM

Alcatel-Lucent 5620 SAM base platform provides the architecture, security and other facilities utilized by all 5620 SAM applications. It also provides a north-bound interface for OSS/BSS application integration. (See Table 5 for the platform feature summary.)

Scalable, secure and flexible system architecture

High availability, system redundancy and fast system failover options allow operators to implement a highly secure network operations environment. The distributed architecture enables support for the largest networks and a massive volume of statistics.

Server virtualization

The 5620 SAM virtualized server deployment enables NMS or IT administrators to easily integrate the 5620 SAM into their standardized environment, reducing OPEX and taking advantage of generic solutions for redundancy and backup/restore. Leverage existing IT technologies such as SAN capabilities for data replication, as well as hypervisor monitoring and maintenance tools.

The 5620 SAM supports service virtualization options using VMware vSphere and Linux KVM hypervisors.

User security with scope of command and span of control

Scope of command allows network administrators to define each operator's access to operations and commands. With span of control, network administrators can subdivide network resources and assign operators clear ownership, based on security privileges for their geographic location, organizational group, job function or individual responsibilities.

OSS/BSS integration

Full access to 5620 SAM functionality and network infrastructure/service management data is provided through an open OSS interface. All 5620 SAM applications, including the 5650 CPAM, share this common north-bound API accessible from a single platform.

External applications may integrate using request-based XML queries, which provide XML results for efficient parsing, as well as Java Messaging Service (JMS) notifications to trigger event-driven behavior.

OSS integrations may also maximize efficiency by triggering 5620 SAM scripts for pre-processing. External applications subscribed to JMS events through the 5620 SAM OSS interface may trigger scripts through the XML API based on these events. (See Figure 1 for more details on automation through 5620 SAM scripts.)

Typical OSS/BSS integrations would include applications for service activation/provisioning, fault management, performance reporting, SLA management, billing, traffic engineering, and network capacity planning.

Alcatel-Lucent OSS Connected Partner Program

The **Alcatel-Lucent OSS Connected Partner Program** further reduces OSS integration time and costs by certifying integration of the Alcatel-Lucent 5620 SAM with applications from industry-leading independent software vendors.

Table 5. Alcatel-Lucent 5620 SAM platform feature summary

CATEGORY	FEATURES
Architecture	• Distributed, high-availability architecture for redundancy and fast system failover • Server virtualization options using VMware vSphere and Linux KVM hypervisors
Security	• Operator profile management, including for controlled user access to NMS functions and network resources • User/OSS client activity logs • Server hardening to industry-standard best practices (for port use, protocol use, authentication, authorization, and so on) • RADIUS/TACACS+ authentication • SNMPv3 trap authentication • SSHv1/v2 to device and SFTP from device • Database error monitoring to scan for SQL injection attacks
OSS/BSS integration	• Open, bidirectional XML and JMS interfaces • Allows many simultaneous operational 5620 SAM OSS clients – 30 for XML API and 10 for JMS • Software development kit with sample code and developer's guide • Custom OSS web application interfaces developed through the Alcatel-Lucent Service Portal • Alcatel-Lucent OSS Connected Partner Program certifies integration between the 5620 SAM and market-leading OSS applications

TECHNICAL SPECIFICATIONS

Operating environment

The Alcatel-Lucent 5620 SAM, Release 12, operates on the following:

- Main, database, auxiliary servers and clients
  - ¬ x86 platforms supported: HP® or Oracle® Sun®
  - ¬ Operating systems supported: Red Hat® Enterprise Linux® (RHEL) 6 or Oracle® Solaris™ 10
  - ¬ Databases supported: Oracle® Database 11g
  - ¬ Virtualization: VMware vSphere ESXi 5.0, 5.1 and 5.5 and Linux KVM on RHEL 6.3/6.4/6.5 using QEMU version 0.12.1.2
- Additional clients:
  - ¬ Microsoft® Windows® 7 Professional (32-bit and 64-bit editions)
  - ¬ Microsoft® Windows® Server 2008R2*/2012 (also for client delegate servers; *including support for Citrix XenApp 6.5)

Note: Hardware recommendations may vary depending on scale of deployment. Contact your Alcatel-Lucent representative for the Alcatel-Lucent 5620 SAM Planning Guide for hardware requirements and platform sizing recommendations.

Minimum hardware requirements for Alcatel-Lucent 5620 SAM, Release 12

APPLICATIONS	X86 HP OR ORACLE SUN
5620 SAM main server: • It is recommended that the 5620 SAM server be installed on a workstation separate from that of the 5620 SAM database for large-scale deployments	• 1 quad core CPU • 16 GB RAM • 2 disk drives, minimum 146 GB each
5620 SAM database (Oracle Database 11g): • Stores network objects and configuration • 5620 SAM server can be installed on a workstation separate from that of the 5620 SAM database for large-scale deployments • RAID 0 and 1+0 technologies are supported • Storage area network (SAN) storage is supported with 4 GB or faster optical connections with dedicated Fibre Channel connection between hosts and storage arrays	• 1 quad core CPU • 16 GB RAM • 4 disk drives recommended, minimum 146 GB each
5620 SAM auxiliary statistics collector server: • Dedicated server required for large-scale deployments • For 5620 SAM logToFile large-scale collection • Dedicated server required for call trace and debug trace data collection	• 2 quad core CPUs • 24 GB RAM • 8 disk drives, minimum 146 GB each
5620 SAM client: • GUI presentation front end • Only one client should be installed per platform	• 1 CPU, 2 GHz or higher • 1 GB dedicated RAM • 1 GB available disk space • 1280 × 1024 display resolution
5620 SAM client delegate and third-party remote display server: • Single client install for multiple GUIs for multiple users • Citrix is recommended third-party remote display software • X11 protocol and native X displays supported	• 4 CPU cores • 16 GB dedicated RAM • 1 GB available disk space For a maximum of 15 concurrent GUIs. Increased hardware specifications are required as number of concurrent GUIs increases.

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Alcatel-Lucent 9500 Microwave Packet Radio

Microwave packet transport for longhaul full-indoor | Release 6.0 (ANSI)

The Alcatel-Lucent 9500 Microwave Packet Radio (MPR) family includes a range of Microwave Packet Transport (MPT) units for longhaul applications in a full-indoor configuration. Designed to support long-distance, high-capacity, mission-critical applications, the MPT-HLC units provide flexible, secure, scalable and highly reliable networks that also support a seamless TDM-to-packet migration path option. The MPT-HLC units are integrated in the Alcatel-Lucent 5620 Service Aware Manager for common management with the rest of the 9500 MPR portfolio, enabling consistent operations across end-to-end packet microwave networks. Combined with the 9500 MPR Microwave Service Switch (MSS), the MPT sets the standard for delivering fast, efficient wireless transmission links with flexible networking and simple operations.

MPT-HLC

Two MPT-HLCs in a shelf

MPT-HLC	
Applications	• Backbone and trunking • Full indoor configuration
Physical	• 4.06 in x 7.95 in x 11.14 in (103 mm x 202 mm x 283 mm)
Interfaces	• One GE port (SFP optical plug-in)
Radio	• 4, L6, U6, 7, 8, and 11 GHz • 553 Mb/s standard; up to 1 Gb/s with packet compression • Support for packet compression • Channels: 5 MHz, 10 MHz, 25 MHz, 30 MHz, 40 MHz, 60 MHz
Modulation	• QPSK, 16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM, 512 QAM, 1024 QAM
Weight	• 11.13 lb (5.05 kg)
Power	• 20 V DC to 60 V DC • 120 to 165 W typical depending on configuration and power level

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Technical specifications

Connections

- Optical SFP or SFP cables
- Direct power connection to PDU

Radio

- Two versions:
  - ¬ Standard unit with transmit and receive
  - ¬ Optional unit with diversity receiver and digital combiner
- 1+0/1+1 HSB/SD/FD
- N+0 LAG L1 with or without SD
- Integrated XPIC (greener and more reliable)
- Maximum TX power: 35 dBm
- Support for adaptive coding and modulation (ACM)
- Duplex technology: FDD
- Encryption: AES-256
- Timing transport: 1588v2 PTP, SyncE
- ITU-T G.8264 support

Mechanical

- Each subrack occupies 2.5 RU in a standard 19–in. rack and holds up to 2 MPT-HLCs

Networking

- Ethernet interface: One optical SFP plug-in
- Advanced QoS: Support for IEEE 802.1p, Diffserv, TTL and strict priority
- Dynamic scheduling according to air interface changes
- VLAN: IEEE 802.1P, IEEE 802.1Q, Q-in-Q support
- ERPS: ITU-T G.8032
- Ethernet OAM (IEEE 802.1ag, ITU-T Y.1731, IEEE 802.3ah)

Environmental

- Operating temperature: 23°F to 131°F (-5°C to +55°C)
- Humidity: 0% to 95%, non-condensing

Standards compliance

Regulatory

- FCC Part 101
- Industry Canada SRSP
- NTIA

Safety and environmental

- Telcordia GR-1089
- Telcordia GR-63
- IEEE 1613

Metro Ethernet Forum

- MEF 2.0, MEF 8, MEF 9, MEF 14, MEF 22

Services

- Architecture and design
- Network planning
- Equipment and site engineering
- Installation services
- Integration services
- Performance analysis, network assessment, DCN, synchronization and QoS assessment
- Migration to packet microwave management
- Maintenance
  - ¬ 24x7 technical support
  - ¬ Return for repair or advanced exchange

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MICROWAVE FOR THE BROADBAND ERA

9500 MICROWAVE PACKET RADIO – TRANSCENDING OBSTACLES TO IP

Alcatel·Lucent

LEVERAGING MICROWAVE TO ADDRESS DEMAND

In today's dynamic market, operators must be able to respond quickly to the relentless demand for bandwidth and services. Microwave wireless transmission solutions can help. Microwave solutions can be deployed quickly in scenarios where wireline alternatives such as fiber optic cable are not feasible or would be too costly to deploy. Microwave is ideally suited, for example, to small cell and macro cell mobile backhaul and long-haul transport/trunking. There can, however, be no compromise in quality and microwave solutions must meet high availability standards. This is especially important for mission-critical networks such as those supporting energy, transportation and public sector communications.

Alcatel-Lucent's flexible wireless transmission solutions enable operators to meet the demands of an Ultra-Broadband world, both in terms of capacity and reliability. And they do this while holding the line on operating and capital expenditures.

THE EVOLVING NATURE OF NETWORK TRAFFIC

Microwave network operators are under constant pressure to support new Ultra-Broadband technologies such as LTE. These new technologies deliver more bandwidth to end users, and that in turn fosters the growing adoption of IP-based applications and services. Demand for traditional voice services is decreasing as more people opt for IP voice, along with other IP data services. Mobile subscribers want everything available on their tablets and smartphones: high-speed Internet, applications, and mobile video. Many will be moving to voice over LTE (VoLTE). Industry and enterprise services and applications are also evolving to IP, with rich media content and applications. Mission-critical networks are being stressed by the need to reliably support higher-bandwidth applications, including video. All of this IP traffic demand is making it harder for traditional wireless transmission solutions to keep up.

Network capacity, quality of service (QoS) and availability demands are pushing networks to their limits and have, in many cases, created network bottlenecks. Although demand is coming from many sources, there is one constant. Networks must be designed for the optimal transport of IP traffic, or they run the risk of quickly becoming obsolete.

At the same time, new IP networks must continue to support traditional traffic types. This so-called legacy traffic is embedded in many networks, and requires a long replacement cycle. If their new IP networks cannot effectively support the small but critical amount of traditional traffic, operators will have to operate parallel networks. Alternatively, they could be forced into a hybrid network structure that might address the needs of traditional traffic but is ineffective at supporting the future growth of IP, leading to prohibitive operating costs and poor service quality.

Alcatel-Lucent has developed microwave solutions that are specifically designed to meet the needs of an IP future, while enabling ongoing effective support of traditional technologies.

For the foreseeable future all communications traffic will be based on IP.

MICROWAVE SOLUTIONS FROM ALCATEL-LUCENT

Alcatel-Lucent's packet-based microwave solutions set the standard for delivering faster, longer, more reliable and efficient wireless transmission links and networks. Proven in more than 250 networks worldwide, the portfolio has been deployed in a wide range of applications including 2G, 3G and 4G/LTE mobile backhaul, high-capacity long-haul trunking/transport, and mission-critical networks. Alcatel-Lucent's packet microwave solutions also support a smooth transition from traditional or legacy traffic to all-IP for increased network capacity at a lower total cost of ownership (TCO).

It is clear today that IP data services are the way of the future. And yet few microwave vendors have moved as quickly as Alcatel-Lucent to make the strategic investments necessary to evolve their microwave systems to fully support IP data. As services continue to transition to data, an architecture focused on supporting IP packet traffic makes natural sense. However, any new technology should also support the traditional services that are already in place. Alcatel-Lucent's packet-based architecture is built with the understanding that TDM and ATM services must be supported along with IP. Only a common network that efficiently supports both IP and traditional services will enable a smooth evolution to all IP services and minimize network TCO. Alcatel-Lucent's microwave offering packetizes traditional services, but does so in a unique way that has no impact on the SLAs for the traditional services.

Alcatel-Lucent's microwave solutions are based on the Alcatel-Lucent 9500 Microwave Packet Radio (MPR) portfolio. Details on this solution portfolio are provided later in this brochure. The following describes how these solutions can be deployed in real-world networks today.

Alcatel-Lucent packetizes traditional services in a unique way that has no impact on SLAs.

Microwave deployment applications

MOBILE BACKHAUL

Microwave access to cell sites is an important building block for the delivery of mobile services. Today, more than 50% of the world's cell sites are connected to the network over microwave access. As both macro and small cell sites transition to packet-optimized, higher-speed 4G/LTE services, scalable cost-effective solutions to support this evolution are required.

Several types of wireless cell site connection options are required to support mobile network capacity and coverage expansions. Alcatel-Lucent's 9500 MPR solutions support a full suite of wireless frequency options including 5.8 - 42 GHz solutions for macro cell backhaul, 80 GHz millimeter wave solutions that are typically used for macro cell backhaul, unlicensed 60 GHz millimeter wave and sub-6 GHz solutions that are typically used to support the backhaul of small cells.

These flexible deployment options allow mobile operators and backhaul transport providers to rapidly deliver high capacity connectivity to cell sites wherever they are needed. Alcatel-Lucent mobile backhaul solutions offer:

- High capacity, small cell and macro cell backhaul options
- Full-indoor and full-outdoor deployment options
- Seamless evolution to IP networks
- Support for any network topology
- End-to-end connectivity: from small cell to macro cell and long-haul

LONG-HAUL TRANSPORT

Long-haul microwave systems are typically used to aggregate multiple services in a wider transport network and provide connectivity on long distance transport spans (e.g. 20 to 250 km) when fiber is not a cost-effective option. This configuration can be used to support fixed/wireline communications together with mobile communications.

Alcatel-Lucent long-haul transport capabilities include:

- Efficient waveguide, couplers, and transceiver components to maximize long-haul link distance while delivering optimal network TCO
- 1024 QAM modulation support with superior transmit power
- High performance equalizers to minimize the need for the deployment of costly 2 antenna space diversity systems.
- Integrated digital combiners to reliably extend the reach of long-haul links over the most challenging terrain.
- Proven interworking with traditional SDH/SONET wireline and microwave systems
- Standards-based interworking with modern packet optical systems using ITU-T G.8032v2 Carrier Ethernet networking
- Seamless evolution to IP networks
- Flexible configurations to address all network site constraints and save on space and/or power:
  - ¬ Various sized long-haul indoor footprints
  - ¬ Transceiver packaging options that leverage common technology, and offer protection flexibility with integrated XPIC and antenna diversity ports
  - ¬ Industry-leading 20 direction density/rack for terminal or repeater site applications
- An evolution path to 10G long-haul packet microwave

When network failure is not an option.

MISSION-CRITICAL NETWORKS

Mission-critical networks are deployed by many industries including utilities and transportation authorities, public safety organizations, governments and defense organizations. These are referred to as “mission-critical” networks because they are used to monitor and protect critical infrastructure that provides life-saving assistance in the event of emergencies. Mission-critical networks must support safe and continuous 24 x 7 operations. These networks often need to reach remote areas over difficult terrain. Alcatel-Lucent’s low-risk, high-availability microwave solutions can readily support these mission-critical requirements. They also provide full support for IP transformation and can be delivered as part of an end-to-end approach that spans fixed and wireless networking.

When network failure is not an option, operators need solutions that offer:

- High availability and capacity over long distances
- Full-indoor and full-outdoor deployment options
- Seamless evolution to IP networks
- Support for any network topology

ALCATEL-LUCENT **9500 MICROWAVE PACKET RADIO**

Since our ground-breaking initial packet microwave product introduction in 2008, we've grown the Alcatel-Lucent 9500 MPR portfolio to be the most complete end-to-end packet wireless transmission offer in the industry. Our portfolio includes standalone microwave and integrated microwave solutions with in-house packet optical and IP/MPLS switching and routing offers. The entire portfolio is managed by the Alcatel-Lucent 5620 Service Aware Manager (SAM) network and service management suite to simplify end-to-end operations.

Build faster, longer, more efficient and reliable microwave links

The unique features of the Alcatel-Lucent 9500 MPR portfolio let operators deliver more data with superior performance and availability while using less spectrum and equipment. These features include:

- Advanced packet compression techniques that increase channel spectrum capacity
- Scalable multichannel microwave links that support increased capacity and reliability
- High order adaptive modulation that extends across multiple channels to sustain maximum performance in all environments
- Support for maximum system gain using high performance equalizers and integrated digital combiners to reliably extend the reach of links over the most challenging terrain.

Boost capacity and reliability with advanced networking

With Alcatel-Lucent 9500 MPR solutions, you get advanced Carrier Ethernet networking capabilities and high availability. These capabilities include:

- Unique ring and mesh topology configurations that can double network capacity, improve reliability and reduce network costs
- Integrated IP-microwave solutions that reduce space and power consumption
- The ability to support TDM, ATM, Ethernet and IP services on a single packet-based network

Simplify operations with an end-to-end approach

The 9500 MPR portfolio encompasses the needs of a wireless transmission network end to end. It includes a complete family of solutions that addresses all network sizes and locations including tail, hub and backbone sites. With an approach that uses common equipment and software across all sites, Alcatel-Lucent helps operators streamline management processes and reduce TCO. The solution portfolio offers:

- Common radio transceivers that reduce the need for spares across all applications
- A flexible range of right-sized Indoor Units optimized to reduce space and power consumption
- Common software and network management that simplify operations across the network

Innovative, end-to-end product family efficiently addresses all sites and applications.

9500 MPR
SOLUTION COMPONENTS

Microwave Packet Terminal

The 9500 MPR Microwave Packet Terminal (MPT) transceivers all leverage the same software and technologies whether they are deployed in a split-mount, full-indoor, or full-outdoor configuration. This offers operators more deployment flexibility, minimizes spares inventory, and results in lower network TCO (see Figure 1). The MPTs support:

- Advanced packet compression
- Hitless, high order adaptive modulation
- IP along with legacy technologies
- Integrated cross-polarization to double capacity
- N+N hot standby with spatial diversity options

Both short-haul (less than 20 km) and long-haul (greater than 20 km) MPTs are available to address distance and availability needs.

Microwave Service Switch indoor units

Full-outdoor MPTs can be deployed independently (for example, connecting directly to an LTE eNode B mobile base station) or together with a 9500 MPR Microwave Service Switch (MSS) indoor unit to offer additional networking flexibility. The MSS comes in various sizes to suit different requirements, as shown in Table 1.

The complete range of right-sized indoor microwave units addresses any site footprint requirement. The units are energy-efficient, extremely scalable and offer deployment flexibility. All indoor units support traditional services such as TDM and ATM, and newer Ethernet and IP services over a converged, packet-based, operationally efficient network. To minimize operational complexity, the various MPTs and MSSs share common technology, software, and network and service management. They can be combined to support any wireless transmission application.

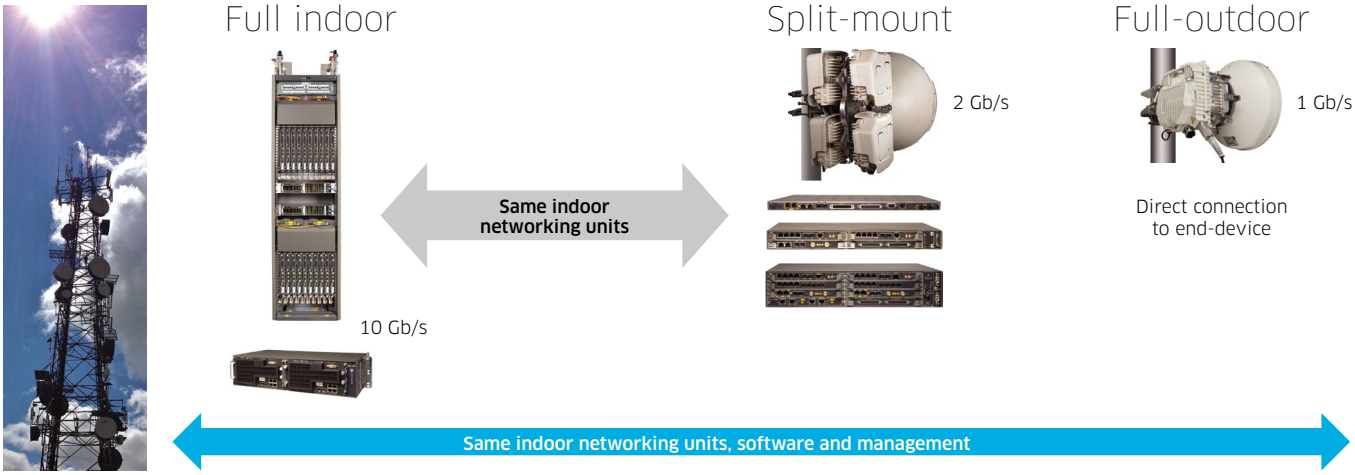
9500 MPR solution portfolio

An Alcatel-Lucent 9500 MPR solution consists of a combination of full-indoor and split-mount MPT and MSS components. Depending on the options chosen, the solution can be used in tail, hub, and long-haul packet microwave applications and supports frequencies

Table 1. 9500 MPR Microwave Service Switch

FEATURES	MSS-1	MSS-4	MSS-8
Chassis	• Fixed • No slots • 16 Gb/s • Operating temp: -40 C to +65 C	• Modular: 2 core slots (1+1), 2 interface slots • 16 Gb/s • Operating temp: -40 C to +65 C	• Modular: 8 slots • 2 core slots (1+1), 6 interface slots • 16 Gb/s • Operating temp: -40 C to +65 C
Interfaces	• 16 E1/DS1, 4x10/100/1000 RJ-45, 2x SFP • Console, sync-in and sync-out, management, alarm	• Up to 64 E1/DS1, 4 DS3, 4 STM1/OC3, 2 E3, 22 GE • Console, sync-in and sync-out, management, alarm	• Up to 192 E1/DS1, 12 DS3, 2 E3, 12 STM1/OC3, 54 GE • Console, sync-in and sync-out, management, alarm
Services	• TDM/PDH, SONET/SDH • MEF compliant E-Line, E-Tree, E-LAN	• TDM/PDH, SONET/SDH • MEF compliant E-Line, E-Tree, E-LAN	• TDM/PDH, SONET/SDH • MEF compliant E-Line, E-Tree, E-LAN
Networking	• ITU-T G.8032 • Multichannel Ethernet LAG • SONET/SDH	• ITU-T G.8032 • Multichannel Ethernet LAG • SONET/SDH	• ITU-T G.8032 • Multichannel Ethernet LAG • SONET/SDH
Power	• Dual feeds: +/-24V DC to +/- 48V	• Single feed: -48 DC, or optional integrated +24V DC	• Dual feeds: -48 DC, or optional integrated +24V DC

Figure 1. Flexible deployment options



from 5.8-42 GHz and 80 GHz. Figure 2 illustrates the 9500 MPR wireless transmission solution portfolio.

9500 MPR-e

The 9500 MPR-e is a full outdoor MPT solution set optimized for Ethernet-oriented all-outdoor deployments. The 9500 MPR-e is fully integrated with the Alcatel-Lucent 7705 Service Aggregation Router (SAR) IP/MPLS portfolio, including support for the 9500 MPR-e as a native 7705 SAR microwave interface. Microwave-specific cards have been added to the 7705 SAR to support microwave protection and powering.

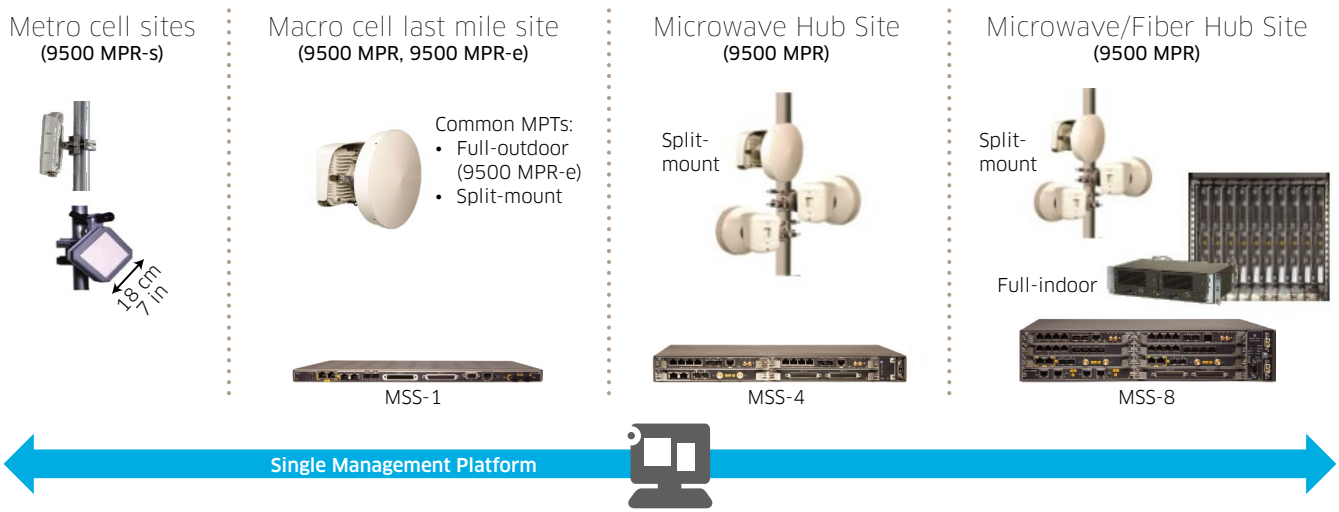
This level of integration offers unique capabilities for deploying IP/MPLS networking over microwave links:

- The solution offer is managed as a single network element, under common network management. This unique capability brings a number of OPEX advantages. For example, regardless of how many radio instances exist, network element maintenance procedures, such as software upgrades and configuration backups, are done only once to all components.
- Microwave radios can be directly powered by IP/MPLS cell site devices which provide lightning protection and voltage surge suppression. This simplifies and optimizes cell site battery feed planning and installation.
- Collapsing two platforms into a single compact and very flexible platform reduces real estate requirements, operations complexity and energy costs.

9500 MPR-s

The 9500 MPR-s is a solution set optimized for small cell site deployments leveraging sub-6 GHz and 60 Ghz radio frequencies. These products can also be used in other segments and can extend access to Carrier Ethernet business services the last mile to the customer.

Figure 2. 9500 MPR solution portfolio



9500 MPR SOLUTION FEATURES

Common software and management

Components of the 9500 MPR portfolio leverage the same technologies, software, network and service management. Deployment flexibility and streamlined management processes reduce network TCO.

Advanced networking to support any network topology

To reliably network microwave and fiber sites MSS indoor units support both traditional SDH/SONET networking, and advanced standards ITU-T G.8032v2-based Ethernet networking. This ITU-T G.8032v2 support allows networks to benefit from the inherent strengths of ring architectures:

- Network capacity can be doubled by sending traffic in both directions around the ring when failures aren't present.
- Ethernet loops can be easily contained by blocking traffic on selected ring spans, avoiding the need for complex, spanning tree-based network protection mechanisms, which are slow to react to failure (such as Rapid Spanning Tree Protocol).
- 50 ms protection can be easily implemented by turning traffic away from failed ring spans.

With the option to packetize traditional services, all services can take advantage of the reliability and scale that ITU-T G.8032v2 provides. This introduces further operational simplification when compared to hybrid microwave systems, which require the use of both packet and TDM networking technology to create microwave networks.

Multichannel

Scaling capacity on traditional microwave links has typically relied on 1:N-based protection algorithms. These algorithms require extra capacity for the protection channel – capacity that is not optimally used when protection events are not present. Packet microwave solutions can leverage more efficient protection mechanisms based on Ethernet link aggregation (LAG) algorithms. LAG implementations bond channels together to create a larger virtual link without the need to dedicate protection capacity.

The Alcatel-Lucent packet microwave implementation, which bonds microwave channels together to create larger virtual links, is referred to as multichannel. Although it is based on LAG, it has been uniquely adapted to the microwave environment to carry traffic under the most severe environmental conditions (that is, it is "adaptive modulation aware"). The use of a multichannel reduces the number of channels required to reliably scale a microwave link. It also optimally distributes traffic between channels, and understands the microwave environment. This leads to more reliable, efficient, and operationally effective microwave links.

Advanced packet compression

Packet compression is another mechanism that can be used to scale packet microwave link capacity. Alcatel-Lucent has implemented advanced packet compression capabilities in its "Packet Booster" feature. Packet Booster can increase microwave link efficiency by as much as 300%.

Feature flexibility

Packet Booster, multichannel, and the evolution of traditional services to all-IP with ITU-T G.8032v2 networking: these are all powerful and unique Alcatel-Lucent features. These features can be deployed independently or together. However, it is when they are used together that the advantages over traditional microwave systems are most convincing and provide the foundation for:

- Faster, longer, more efficient links for all services
- Advanced 50 ms failover protection for all services

5620 SAM INTEGRATION

The 9500 MPR portfolio is integrated with the industry-leading Alcatel-Lucent 5620 SAM software suite. This allows the 9500 MPR portfolio to take advantage of a network and services investment that spans Alcatel-Lucent's IP/MPLS, packet optical, and RAN portfolios. It provides a single end-to-end management solution for all networking and service deployments and operational needs.

As microwave transport becomes integrated with IP packet networks, operators are faced with the challenge of adjusting network management systems, workflows and processes to efficiently manage the converged IP microwave packet network. There are many inter-dependencies that can be better managed when an integrated management approach is possible. An integrated approach will also reduce the number of touch-points across the multi-technology network.

To optimize operations, service providers need a unified, end-to-end view across multi-technology layers for effective service provisioning and assurance. They need the flexibility to logically divide and control workflows between IP and microwave transport network domains, and to be able to manage and monitor both technologies together from a service perspective. The 5620 SAM provides converged, cross-domain management that transcends the traditional product and technology boundaries and spans element, network and service management. It enables operators to manage transport services end-to-end with cross-layer visibility.

Transcend traditional product and technology boundaries.

For IP and microwave solutions, the 5620 SAM offers:

- Complete coverage of both IP and microwave equipment management (fault, configuration, alarm, performance and system/security)
- Automated configuration and flexible connectivity and bandwidth provisioning for the end-to-end IP network
- Integrated IP and microwave topology visualization and proactive monitoring
- Advanced real-time troubleshooting capabilities that isolate emerging issues down to the IP or microwave domain, pin-pointing the root cause of the problem within the domain before it impacts services
- Flexible, open architectures for fast, cost-effective integration with existing operational processes and systems

With the 5620 SAM, operators can proactively identify and resolve potential problems in the network before they impact customers. Service testing, for example, gives detailed information on service performance to determine where increased latency, jitter or packet loss could diminish the user's quality of experience (QoE).

Integrated graphical views of the physical and logical topology depict all resources traversed by a service, including both microwave transport and IP data service links. Integrated fault management isolates microwave transport versus IP data services problems. Enhanced multi-layer alarm correlation reduces the number of alerts and identifies the root cause of the problem. Operators can drill down into affected resources and services.

SUMMARY

Alcatel-Lucent 9500 MPR wireless transmission solutions offer outstanding performance, along with networking and operational simplicity. They enable operators to address the growing wave of IP services and to benefit from:

- Faster, longer, more efficient and reliable radio links with support for a range of advanced and innovative features. These features increase link capacity, so operators can deliver more services and a higher QoE for their customers.
- Support for advanced packet networking, which increases microwave network reliability and scale.
- Operational simplification with a unique streamlined end-to-end portfolio approach that can help operators reduce the TCO for their networks.

Through its 9500 MPR portfolio, Alcatel-Lucent ensures that wireless transmission is not a barrier to building modern IP networks. Instead, microwave deployments can be used to support and expedite the evolution to IP that will enable operators to keep up with the relentless demand for more bandwidth and services.

Support and expedite the evolution to IP.

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Alcatel·Lucent

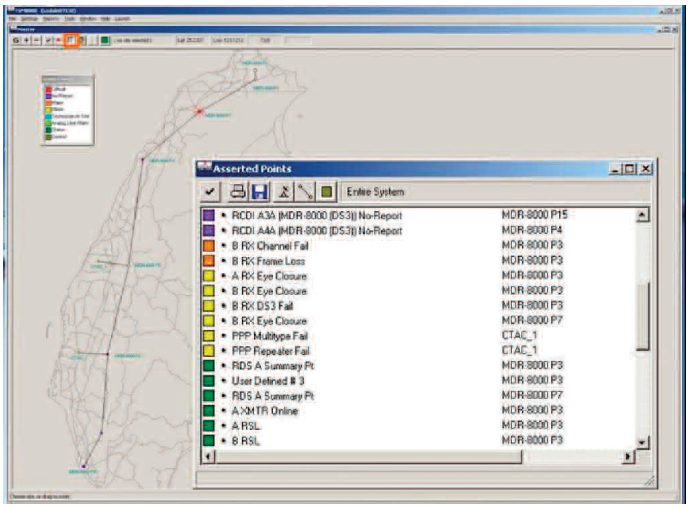
Nokia TSM-8000

Fault management system

The Nokia TSM-8000 provides highly reliable fault management and control of modern telecommunications networks. The TSM-8000 is a graphically oriented element management system. It is scaleable through software keys to support small, medium, or large telecommunications networks. The TSM-8000 supports multiple users, multiple networks and multiple protocols. It automatically collects and stores alarm, status and performance data from the monitored transmission system equipment. This information is displayed both graphically and textually. The TSM-8000 also provides comprehensive reports for all current and historical activity for the entire network including all operator actions.

The TSM-8000 supports SNMP (V1, V2 and V3), TL1and MCS-11 protocols for fault management. It uses a Client/Server architecture residing on MicroSoft Windows® platform.

Remote access, alarm paging and e-mail notification are standard features. Custom audible alarms, paging and e-mail notifications keep users updated tonetwork status. As an optional feature the customer can assess the TSM-8000 via a Web Browser for remote visibility where access to the Internet is available.



Features

Versatile network views

- Network view customizable by user
- Virtual equipment using arbitrary alarm grouping
- Virtual alarms using Boolean logic and time weighting
- Alarms and controls grouped by user-defined functionality
- One click access to highest priority unacknowledged alarm
- One click access all current alarm activity
- Transmission and telemetry networks monitored
- Multiple active masters supported
- Concurrent geographic and alarm log network views

NOKIA

Flexible reports

- Alarms, controls and user actions recorded to history log
- Customizable reports sorted by time, date, network, equipment attributes, or operator actions
- Bandwidth Utilization Reports
- Automated Microwave Link Availably
- Path up/down reports

Enhanced network reliability

- Redundant telemetry architecture
- Monitored telemetry channels
- Monitored server and client operation
- Two click last hour and last day reports
- Automatic periodic user-defined reports
- Interaction with Weather Maps

Full featured controls

- Control permission by network or equipment group
- Positive operational notification
- 9500 MPR Service Provisioning

Modern protocol support

- SNMP or ASCII reporting to higher level manager of managers
- SNMP, TL-1 and MCS-11 surveillance of network elements

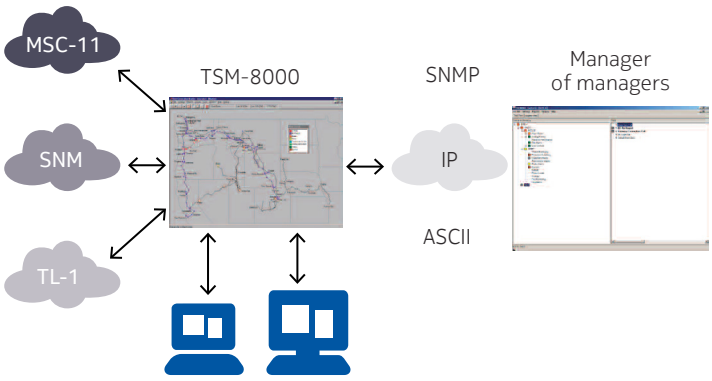
Nokia services support options

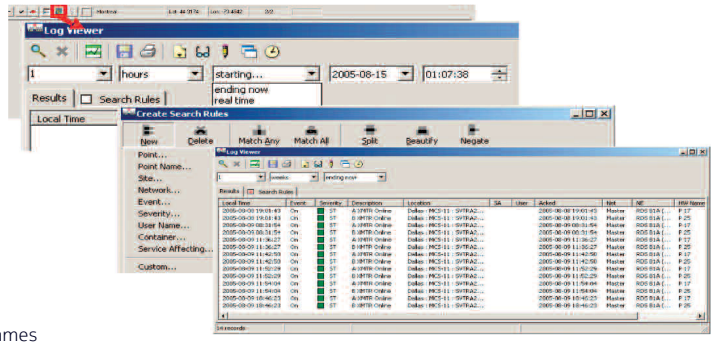
- Data base configuration
- On site installation and test
- Vendor or customer location training
- Customization of equipment unique TL-1 and SNMP alarms and controls
- Custom telemetry network design

Technical specifications

TSM-8000

- Simultaneous users: Up to twenty five
- Network Elements: Scalable 32, 64,128, 256, 512, or 1024
  (Upgrading to a larger system only requires additional software)
- Architecture: Client-Server
- Server OS: Windows 2012 or Windows 7® Server
- Client OS: Windows 7
- Users: One
- Network elements: Up to 128
- Operating system: Windows XP Pro®
- Architecture: Stand-alone computer (Desktop)
- Power requirements: 110 V AC or 220 V AC





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Product code: PR1606020716EN (July)

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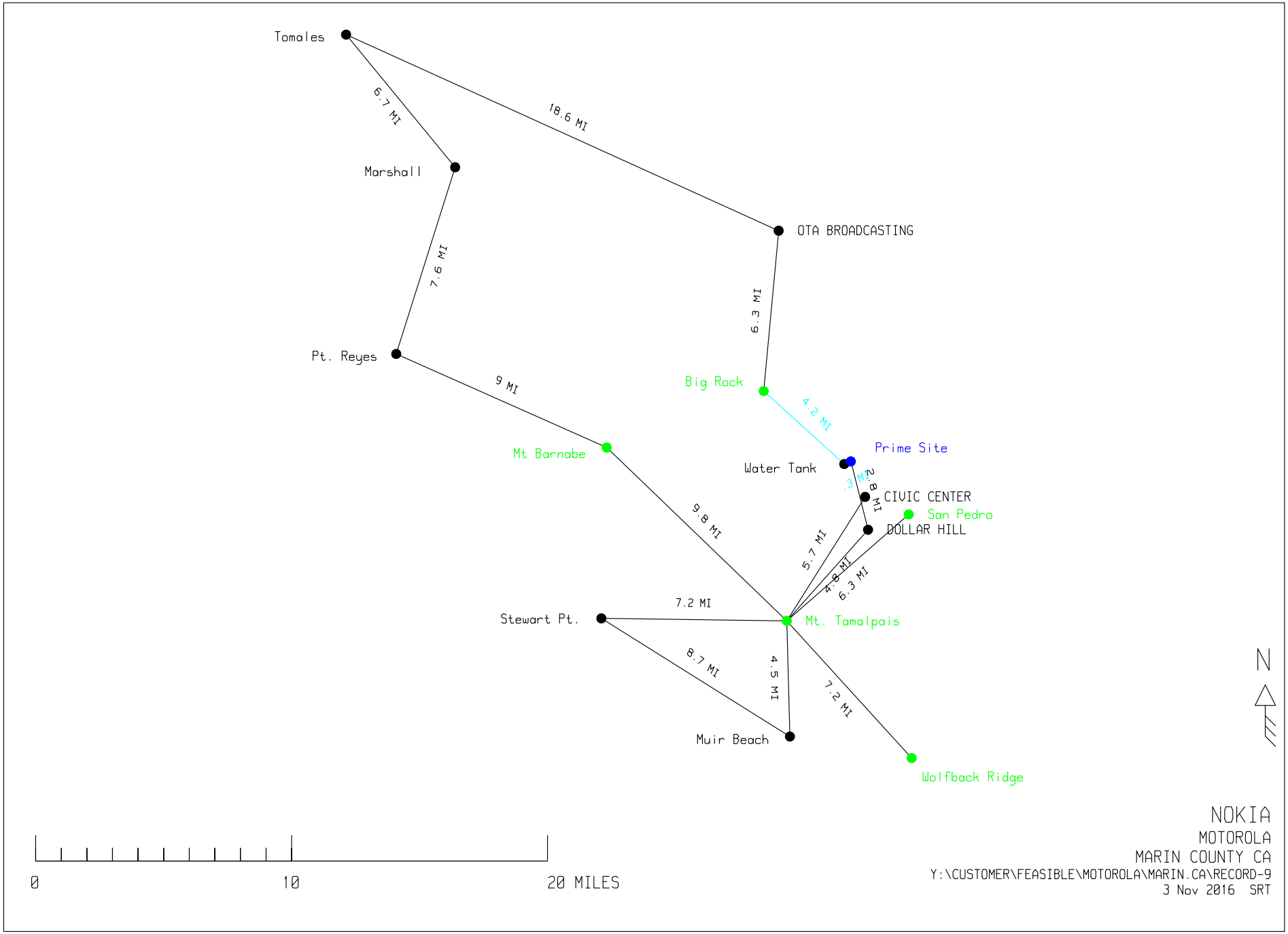

Tomales
6.7 MI
18.6 MI
Marshall
OTA BROADCASTING
7.6 MI
6.3 MI
Pt. Reyes
9 MI
Big Rock
4.2 MI
Prime Site
Mt Barnabe
Water Tank
.3 MI
2.8 MI
CIVIC CENTER
San Pedro
9.8 MI
5.7 MI
DOLLAR HILL
4.8 MI
6.3 MI
7.2 MI
Stewart Pt.
Mt. Tamalpais
8.7 MI
4.5 MI
7.2 MI
Muir Beach
Wolfback Ridge
N
0
10
20 MILES
NOKIA
MOTOROLA
MARIN COUNTY CA
Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-9
3 Nov 2016 SRT

MAIN CLEARANCE CRITERIA: - 0.6 of the 1st FRESNEL at K=1
PROPOSED STRUCTURE 300 FEET
PROPOSED STRUCTURE 300 FEET
300
250
200
150
100
50
972.2 FEET AMSL
MAIN CL 25 FEET
MAIN CL 21 FEET
364.1 FEET AMSL
Tomales
PATH ROUGHNESS IS 140 FEET
Marshall
38-15-39.1 N
122-54-13.2 W
0
5
38-11-09.0 N
122-49-30.6 W
NAD83 AZIMUTH = 140.4
F = 11.2 GHZ
DISTANCE IN MILES
D = 6.71 MI
AZIMUTH = 320.5 NAD83
GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH
TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA
K=1
K=4/3
K=INFINITY
NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-1
DATE: 30 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Tomales	Marshall
TROYER		NAD83 38 15 39.1 N 122 54 13.2 W	NAD83 38 11 09.0 N 122 49 30.6 W
GROUND ELEVATION	Feet	364.1	972.2
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	21.0	25.0
MAIN FEEDER LENGTH	Feet	51.0	55.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.5
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.0	63.9
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	6.7	
MEAN ANNUAL TEMPERATURE	Deg F	52.7	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	134.1	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-33.4	-33.4
THERMAL FADE MARGIN	dB	36.6	36.6
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.6	36.6

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Tomales	Marshall
TROYER		NAD83 38 15 39.1 N 122 54 13.2 W	NAD83 38 11 09.0 N 122 49 30.6 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	4.1	4.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	8.3	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.5	
PATH AVAILABILITY 2-WAY	percent	99.9999721	8.8 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

MAIN CLEARANCE CRITERIA: - 0.6 of the 1st FRESNEL at K=1
PROPOSED STRUCTURE 100 FEET
EXISTING MONOPOLE 16 FEET
MAIN CL 11 FEET
1327.9 FEET AMSL
100
50
MAIN CL 20 FEET
972.2 FEET AMSL
Marshall
PATH ROUGHNESS IS 140 FEET
Pt. Reyes
38-11-09.0 N
122-49-30.6 W
0
5
38-04-48.1 N
122-52-02.0 W
NAD83 AZIMUTH = 197.4
F = 11.2 GHZ
DISTANCE IN MILES
D = 7.65 MI
AZIMUTH = 17.4 NAD83
GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH
TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA
K=1
K=4/3
K=INFINITY
NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-2
DATE: 23 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Marshall	Pt. Reyes
TROYER		NAD83 38 11 09.0 N 122 49 30.6 W	NAD83 38 04 48.1 N 122 52 02.0 W
GROUND ELEVATION	Feet	972.2	1327.9
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	11.0
MAIN FEEDER LENGTH	Feet	50.0	41.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.1
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.0	64.3
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	7.6	
MEAN ANNUAL TEMPERATURE	Deg F	52.7	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	135.3	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-34.2	-34.2
THERMAL FADE MARGIN	dB	35.8	35.8
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	35.8	35.8

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Marshall	Pt. Reyes
TROYER		NAD83 38 11 09.0 N 122 49 30.6 W	NAD83 38 04 48.1 N 122 52 02.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	7.3	7.3
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH 2-WAY	seconds	14.6	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	1.0	
PATH AVAILABILITY 2-WAY	percent	99.9999506	15.6 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

38-04-48.1 N
122-52-02.0 W

0 5

38-01-37.7 N
122-42-59.0 W

NAD83 AZIMUTH = 113.9 F = 11.2 GHZ DISTANCE IN MILES D = 9.00 MI AZIMUTH = 294 NAD83

- GROUND ELEVATION OF PROFILE
- FRACTION OF 1ST FRESNEL ZONE
- MAIN CENTERLINE/EVEN FRESNEL
- DIVERSITY CL/ODD FRESNEL
- TERRAIN OVER WATER
- OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-3
DATE: 30 Aug 2016 SRT PAGE 1 OF 1

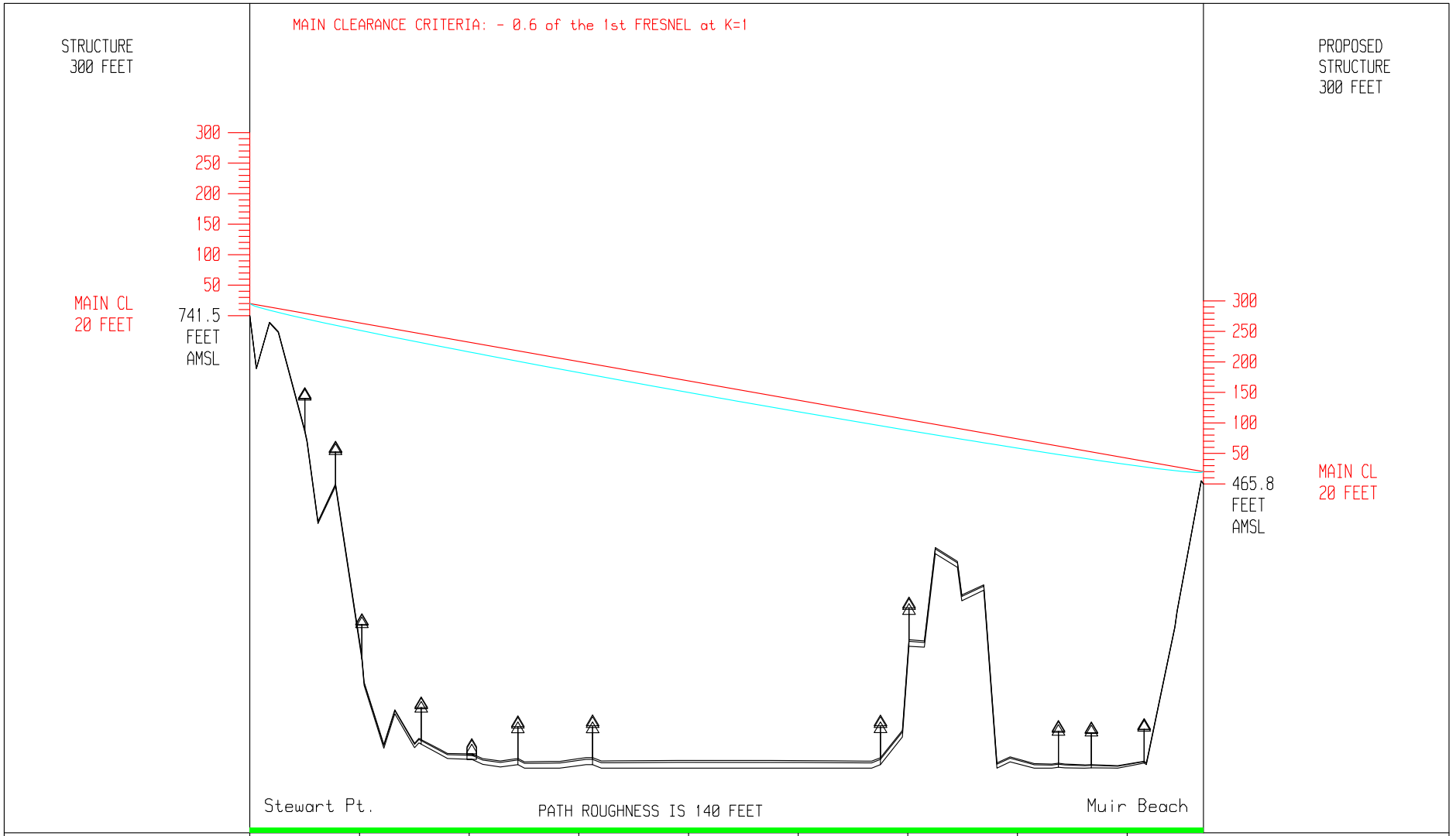
SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Pt. Reyes	Mt Barnabe
TROYER		NAD83 38 04 48.1 N 122 52 02.0 W	NAD83 38 01 37.7 N 122 42 59.0 W
GROUND ELEVATION	Feet	1327.9	1447.1
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	14.0	20.0
MAIN FEEDER LENGTH	Feet	44.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.2	1.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.2	64.0
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	9.0	
MEAN ANNUAL TEMPERATURE	Deg F	54.5	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	136.7	
ABSORPTION LOSS	dB	.3	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.7	-35.7
THERMAL FADE MARGIN	dB	34.3	34.3
MINIMUM FADE MARGIN	dB	27.0	27.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	34.3	34.3

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Pt. Reyes	Mt Barnabe
TROYER		NAD83 38 04 48.1 N 122 52 02.0 W	NAD83 38 01 37.7 N 122 42 59.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	17.4	17.4
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH 2-WAY	seconds	35.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	2.3	
PATH AVAILABILITY 2-WAY	percent	99.9998816	37.3 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
DATE: 31 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Stewart Pt.	Muir Beach
TROYER		NAD83 37 55 49.3 N 122 43 12.6 W	NAD83 37 51 48.1 N 122 35 07.4 W
GROUND ELEVATION	Feet	741.5	465.8
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	20.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.0	64.0
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	8.7	
MEAN ANNUAL TEMPERATURE	Deg F	55.7	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	136.4	
ABSORPTION LOSS	dB	.3	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.6	-35.6
THERMAL FADE MARGIN	dB	34.4	34.4
MINIMUM FADE MARGIN	dB	27.0	27.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	34.4	34.4

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Stewart Pt.	Muir Beach
TROYER		NAD83 37 55 49.3 N 122 43 12.6 W	NAD83 37 51 48.1 N 122 35 07.4 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	15.5	15.5
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH 2-WAY	seconds	31.2	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	2.1	
PATH AVAILABILITY 2-WAY	percent	99.9998944	33.3 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

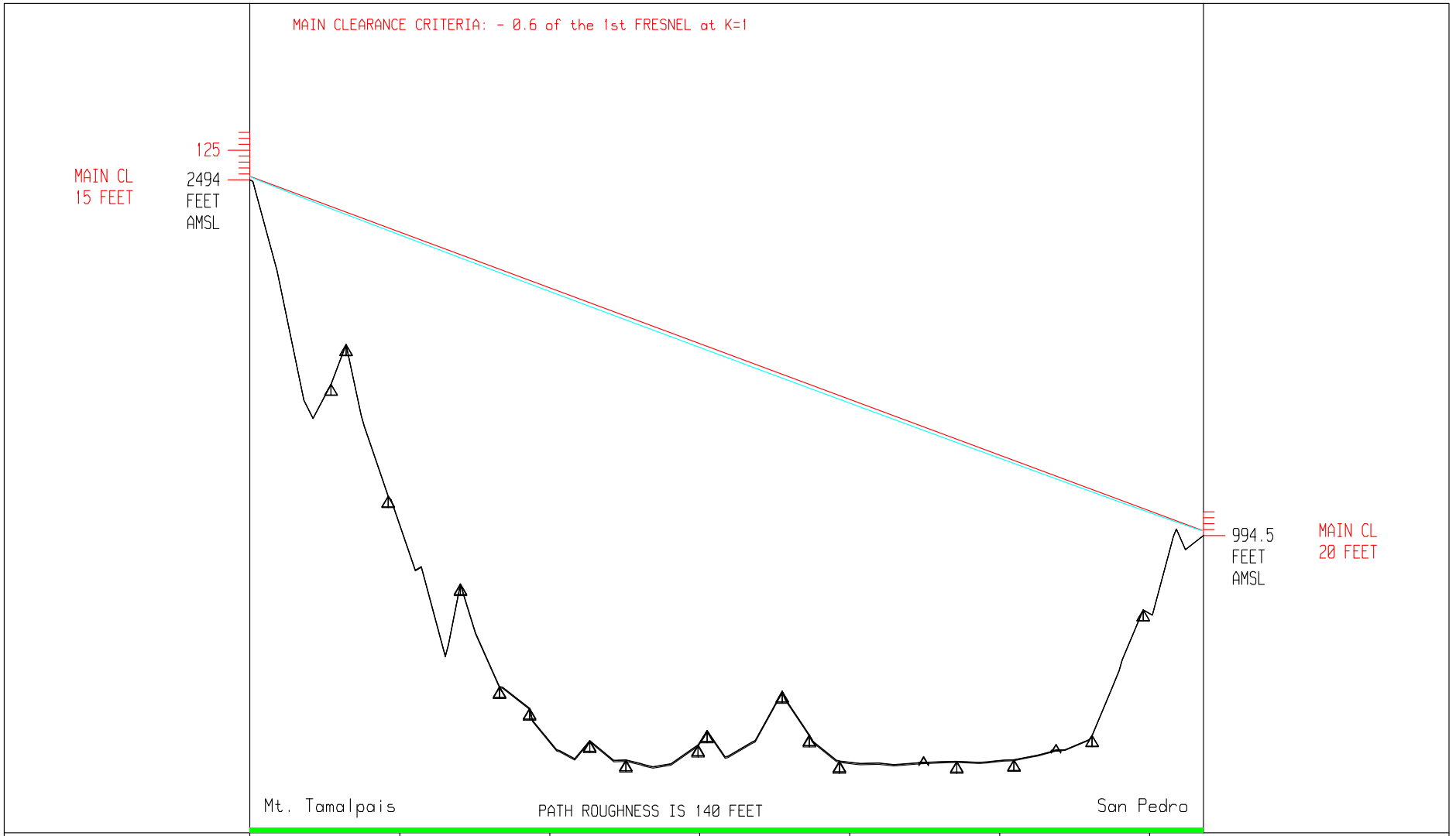
- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

MAIN CLEARANCE CRITERIA: - 0.6 of the 1st FRESNEL at K=1
PROPOSED STRUCTURE 100 FEET
STRUCTURE 199 FEET
125
2494 FEET AMSL
MAIN CL 15 FEET
MAIN CL 20 FEET
1108.7 FEET AMSL
Wolfback Ridge
PATH ROUGHNESS IS 140 FEET
Mt. Tamalpais
37-51-03.7 N
122-29-54.3 W
0
5
37-55-44.0 N
122-35-15.0 W
NAD83 AZIMUTH = 317.8
F = 11.2 GHZ
DISTANCE IN MILES
D = 7.25 MI
AZIMUTH = 137.8 NAD83
GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH
TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA
K=1
K=4/3
K=INFINITY
NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-7
DATE: 19 Oct 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-6
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Wolfback Ridge	Mt. Tamalpais
TROYER		NAD83 37 51 03.7 N 122 29 54.3 W	NAD83 37 55 44.0 N 122 35 15.0 W
GROUND ELEVATION	Feet	1108.7	2494.0
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	15.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.0	64.0
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	7.2	
MEAN ANNUAL TEMPERATURE	Deg F	56.7	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	134.8	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-33.9	-33.9
THERMAL FADE MARGIN	dB	36.1	36.1
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.1	36.1
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	6.3	6.3
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH 2-WAY	seconds	12.7	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.8	
PATH AVAILABILITY 2-WAY	percent	99.9999573	13.5 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-8
DATE: 19 Oct 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-6
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt. Tamalpais	San Pedro
TROYER		NAD83 37 55 44.0 N 122 35 15.0 W	NAD83 37 59 24.7 N 122 30 01.9 W
GROUND ELEVATION	Feet	2494.0	994.5
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	15.0	20.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
PROTECT CHANNEL LOSS	dB	6.0	6.0
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	1.5	1.5
OTHER RECEIVE LOSSES	dB	1.5	1.5
CALCULATED EIRP	dBm	62.5	62.5
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	6.4	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	133.7	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	HOT-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.8	-35.8
THERMAL FADE MARGIN	dB	34.2	34.2
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	34.2	34.2

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-6
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt. Tamalpais	San Pedro
TROYER		NAD83 37 55 44.0 N 122 35 15.0 W	NAD83 37 59 24.7 N 122 30 01.9 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	6.5	6.5
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	13.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.8	
PATH AVAILABILITY 2-WAY	percent	99.9999563	13.8 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-14
DATE: 30 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Stewart Pt.	Mt. Tamalpais
TROYER		NAD83 37 55 49.3 N 122 43 12.6 W	NAD83 37 55 44.0 N 122 35 15.0 W
GROUND ELEVATION	Feet	741.5	2494.0
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	25.0	15.0
MAIN FEEDER LENGTH	Feet	55.0	45.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.5	1.3
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	63.9	64.2
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	7.2	
MEAN ANNUAL TEMPERATURE	Deg F	55.5	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	134.8	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-33.9	-33.9
THERMAL FADE MARGIN	dB	36.1	36.1
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.1	36.1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Stewart Pt.	Mt. Tamalpais
TROYER		NAD83 37 55 49.3 N 122 43 12.6 W	NAD83 37 55 44.0 N 122 35 15.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	6.2	6.2
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	12.4	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.8	
PATH AVAILABILITY 2-WAY	percent	99.9999582	13.2 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

38-01-37.7 N
122-42-59.0 W

0 5

37-55-44.0 N
122-35-15.0 W

NAD83 AZIMUTH = 133.9 F = 11.2 GHZ DISTANCE IN MILES D = 9.77 MI AZIMUTH = 314 NAD83

GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-15
DATE: 30 Aug 2016 SRT PAGE 1 OF 1

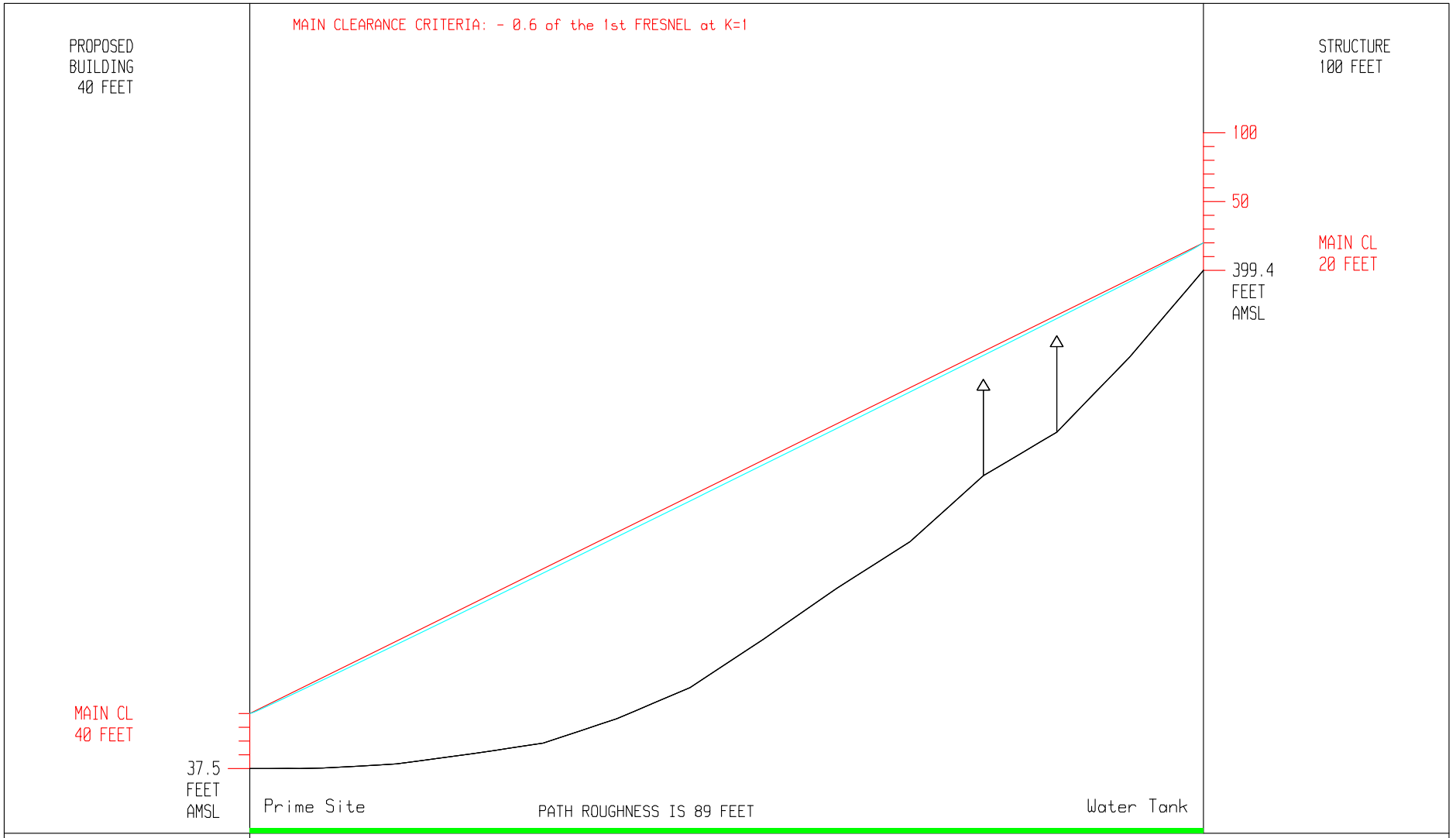
SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt Barnabe	Mt. Tamalpais
TROYER		NAD83 38 01 37.7 N 122 42 59.0 W	NAD83 37 55 44.0 N 122 35 15.0 W
GROUND ELEVATION	Feet	1447.1	2494.0
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	19.0	15.0
MAIN FEEDER LENGTH	Feet	49.0	45.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.3
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	64.1	64.2
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
RADIO IDENTIFIER		95MPR11-L128F30-161	
FREQUENCY BAND	MHz	11200	30M0D7W
PATH LENGTH	Miles	9.8	
MEAN ANNUAL TEMPERATURE	Deg F	55.5	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	137.4	
ABSORPTION LOSS	dB	.3	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	27.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-70.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-36.5	-36.5
THERMAL FADE MARGIN	dB	33.5	33.5
MINIMUM FADE MARGIN	dB	27.0	27.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	33.5	33.5

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt Barnabe	Mt. Tamalpais
TROYER		NAD83 38 01 37.7 N 122 42 59.0 W	NAD83 37 55 44.0 N 122 35 15.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	26.9	26.9
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH 2-WAY	seconds	54.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	3.4	
PATH AVAILABILITY 2-WAY	percent	99.9998180	57.4 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-25
DATE: 23 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Prime Site	Water Tank
TROYER		NAD83 38 01 09.0 N 122 32 29.5 W	NAD83 38 01 03.7 N 122 32 46.5 W
GROUND ELEVATION	Feet	37.5	399.4
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	40.0	20.0
MAIN FEEDER LENGTH	Feet	70.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	2.0	1.4
WET RADOME LOSS	dB	3.8	3.8
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	42.7	43.0
MAXIMUM EIRP (PART 101)	dBm	43.0	43.0
RADIO TYPE and FCC ID		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	.3	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	89.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	106.4	
ABSORPTION LOSS	dB	0.0	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	5.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-26.5	-26.5
THERMAL FADE MARGIN	dB	45.0	45.0
MINIMUM FADE MARGIN	dB	20.0	20.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	45.0	45.0

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Prime Site	Water Tank
TROYER		NAD83 38 01 09.0 N 122 32 29.5 W	NAD83 38 01 03.7 N 122 32 46.5 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	0.0	0.0
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	0.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9999999	0.0 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE
- POWER REDUCED TO MEET FCC EIRP LIMITS

38-01-03.7 N
122-32-46.5 W

0

38-03-32.7 N
122-36-13.9 W

NAD83 AZIMUTH = 312.3 F = 11.2 GHZ DISTANCE IN MILES D = 4.25 MI AZIMUTH = 132.2 NAD83

- GROUND ELEVATION OF PROFILE
- FRACTION OF 1ST FRESNEL ZONE
- MAIN CENTERLINE/EVEN FRESNEL
- DIVERSITY CL/ODD FRESNEL
- TERRAIN OVER WATER
- OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-26
DATE: 30 Aug 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Water Tank	Big Rock
TROYER		NAD83 38 01 03.7 N 122 32 46.5 W	NAD83 38 03 32.7 N 122 36 13.9 W
GROUND ELEVATION	Feet	399.4	1872.6
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	20.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	58.2	58.2
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	4.2	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	130.1	
ABSORPTION LOSS	dB	.1	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-34.8	-34.8
THERMAL FADE MARGIN	dB	36.7	36.7
MINIMUM FADE MARGIN	dB	20.0	20.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.7	36.7
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	1.1	1.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	2.2	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9999929	2.2 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

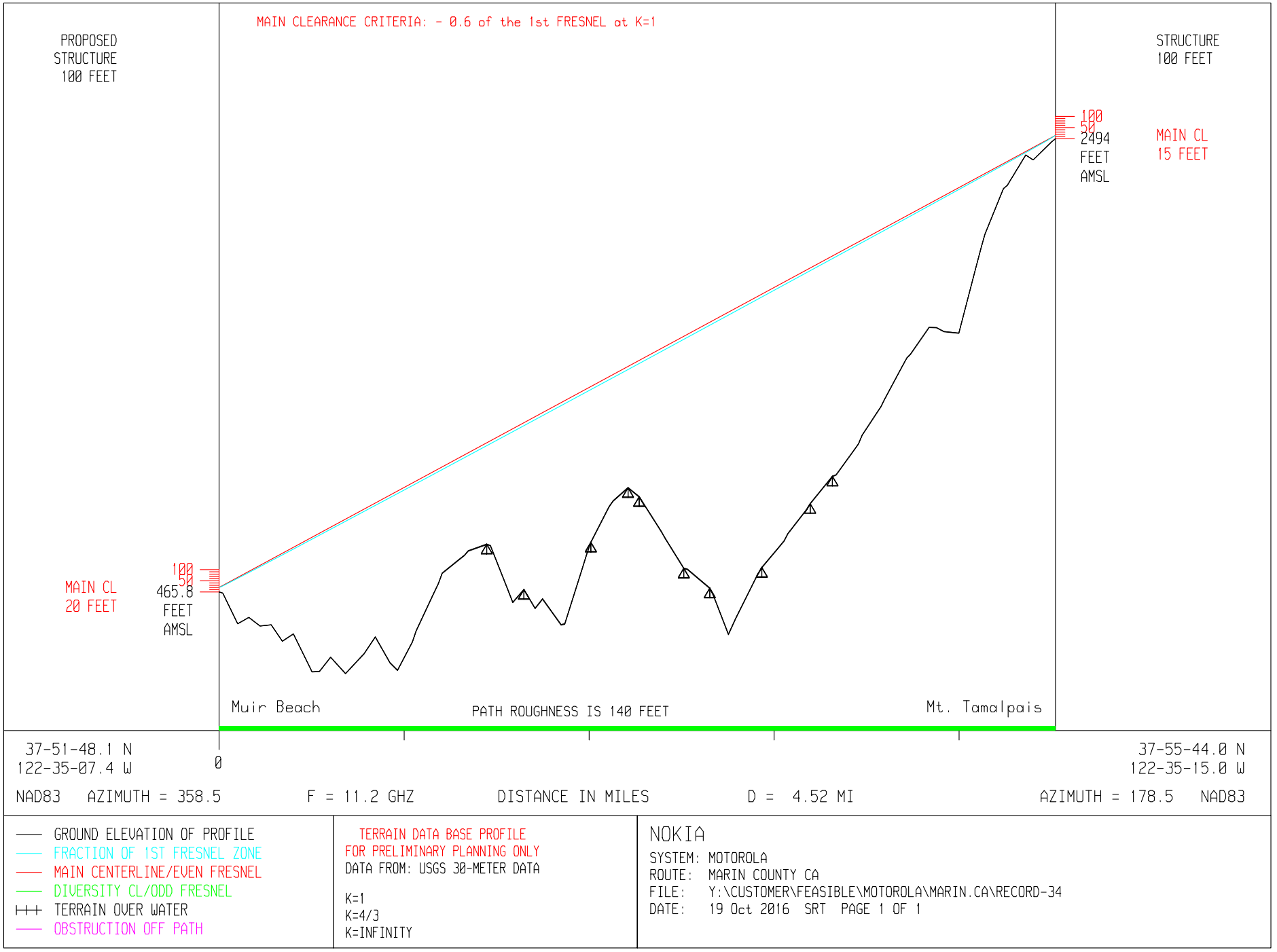
NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-31
DATE: 15 Jul 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-5
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt. Tamalpais	CIVIC CENTER
TROYER		NAD83 37 55 44.0 N 122 35 15.0 W	NAD83 37 59 56.6 N 122 31 52.7 W
GROUND ELEVATION	Feet	2494.0	47.7
MAIN ANTENNA SIZE	Feet	4.0 UHX4-107	4.0 UHX4-107
MAIN ANTENNA GAIN	dBi	40.4	40.4
MAIN RADOME LOSS	dB	0.0 TEFLON	0.0 TEFLON
MAIN CENTERLINE	Feet	13.0	51.0
MAIN FEEDER LENGTH	Feet	43.0	81.0
MAIN FEED LOSS IN dB/100	Feet	3.1 EW90	3.1 EW90
MAIN FEEDER LOSS	dB	1.3	2.5
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	1.0	1.0
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	59.9	58.7
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR11-Q256F30-185	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	5.7	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	132.7	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	55.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-68.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.4	-35.4
THERMAL FADE MARGIN	dB	33.1	33.1
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	33.1	33.1
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	6.1	6.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	12.2	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.3	
PATH AVAILABILITY 2-WAY	percent	99.9999601	12.6 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

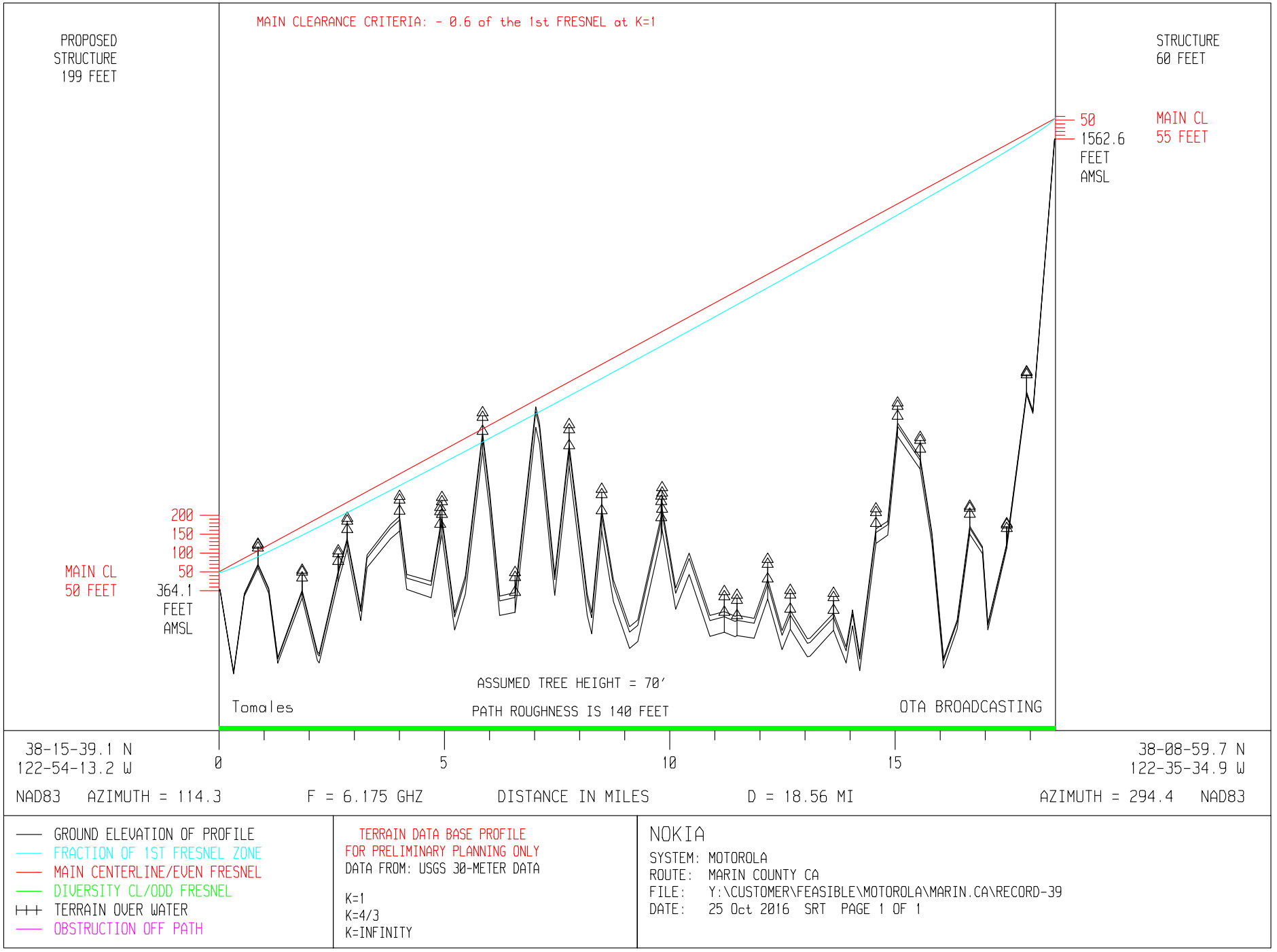
NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-34
DATE: 19 Oct 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-6
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Muir Beach	Mt. Tamalpais
TROYER		NAD83 37 51 48.1 N 122 35 07.4 W	NAD83 37 55 44.0 N 122 35 15.0 W
GROUND ELEVATION	Feet	465.8	2494.0
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	15.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	58.2	58.2
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	4.5	
MEAN ANNUAL TEMPERATURE	Deg F	56.7	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	130.7	
ABSORPTION LOSS	dB	.1	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.4	-35.4
THERMAL FADE MARGIN	dB	36.1	36.1
MINIMUM FADE MARGIN	dB	20.0	20.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.1	36.1
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	1.5	1.5
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	3.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.1	
PATH AVAILABILITY 2-WAY	percent	99.9999902	3.1 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

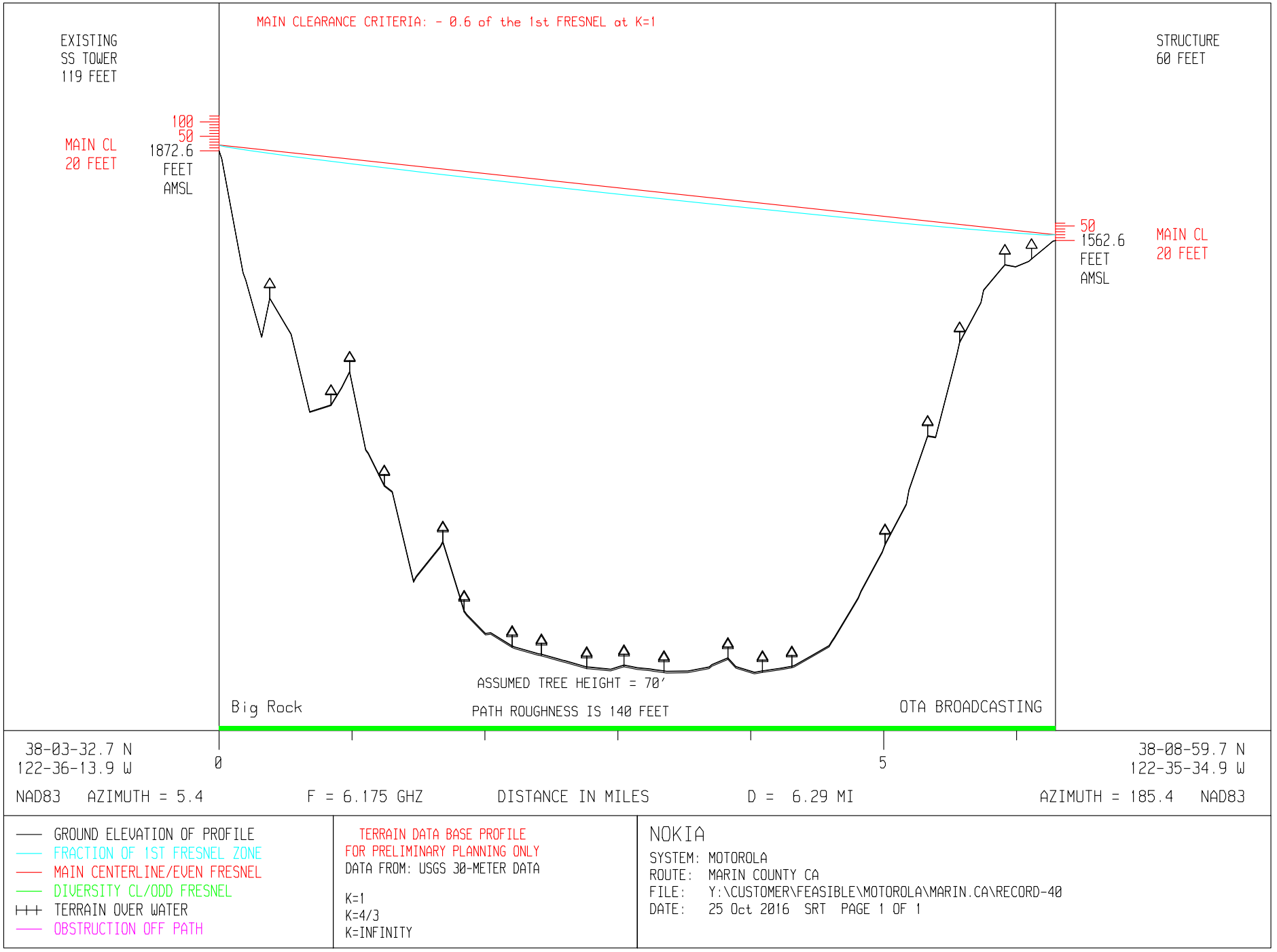
- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE


MAIN CLEARANCE CRITERIA: - 0.6 of the 1st FRESNEL at K=1
PROPOSED STRUCTURE 199 FEET
STRUCTURE 60 FEET
50
1562.6 FEET AMSL
MAIN CL 55 FEET
MAIN CL 50 FEET
200
150
100
50
364.1 FEET AMSL
ASSUMED TREE HEIGHT = 70'
Tomales
PATH ROUGHNESS IS 140 FEET
OTA BROADCASTING
38-15-39.1 N
122-54-13.2 W
0
5
10
15
38-08-59.7 N
122-35-34.9 W
NAD83 AZIMUTH = 114.3
F = 6.175 GHZ
DISTANCE IN MILES
D = 18.56 MI
AZIMUTH = 294.4 NAD83
GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH
TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA
K=1
K=4/3
K=INFINITY
NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-39
DATE: 25 Oct 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-8

Nokia Feasibility		Tomales	OTA BROADCASTING
TROYER		NAD83 38 15 39.1 N 122 54 13.2 W	NAD83 38 08 59.7 N 122 35 34.9 W
GROUND ELEVATION	Feet	364.1	1562.6
MAIN ANTENNA SIZE	Feet	8.0 PAD8-59A	8.0 PAD8-59A
MAIN ANTENNA GAIN	dBi	41.3	41.3
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	50.0	55.0
MAIN FEEDER LENGTH	Feet	219.0	85.0
MAIN FEED LOSS IN dB/100	Feet	1.2 E60	1.2 E60
MAIN FEEDER LOSS	dB	2.6	1.0
OTHER FEEDER LOSSES	dB	.2	.2
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	67.0	68.6
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR61-Q128F30-163	
FREQUENCY BAND	MHz	6175	
PATH LENGTH	Miles	18.6	
MEAN ANNUAL TEMPERATURE	Deg F	56.0	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	137.8	
ABSORPTION LOSS	dB	.3	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	29.0	NON-STANDBY
ATPC POWER REDUCTION	dB	5.0	WITH ATPC
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-31.5 MAX POWER	-31.5 MAX POWER
THERMAL FADE MARGIN	dB	40.0	40.0
MINIMUM FADE MARGIN	dB	33.0	33.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	40.0	40.0
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	23.3	23.3
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.5	.5
TOTAL MULTIPATH 2-WAY	seconds	47.5	
UPFADE OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9998493	47.5 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE


MAIN CLEARANCE CRITERIA: - 0.6 of the 1st FRESNEL at K=1
EXISTING
SS TOWER
119 FEET
100
50
MAIN CL
20 FEET
1872.6
FEET
AMSL
STRUCTURE
60 FEET
50
1562.6
FEET
AMSL
MAIN CL
20 FEET
ASSUMED TREE HEIGHT = 70'
Big Rock
PATH ROUGHNESS IS 140 FEET
OTA BROADCASTING
38-03-32.7 N
122-36-13.9 W
0
5
38-08-59.7 N
122-35-34.9 W
NAD83 AZIMUTH = 5.4
F = 6.175 GHZ
DISTANCE IN MILES
D = 6.29 MI
AZIMUTH = 185.4 NAD83
GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH
TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA
K=1
K=4/3
K=INFINITY
NOKIA
SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-40
DATE: 25 Oct 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-8
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Big Rock	OTA BROADCASTING
TROYER		NAD83 38 03 32.7 N 122 36 13.9 W	NAD83 38 08 59.7 N 122 35 34.9 W
GROUND ELEVATION	Feet	1872.6	1562.6
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	20.0	20.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.4	1.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	58.0	58.0
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	6.3	
MEAN ANNUAL TEMPERATURE	Deg F	56.9	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	133.6	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-38.7	-38.7
THERMAL FADE MARGIN	dB	32.8	32.8
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	32.8	32.8
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	8.7	8.7
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	17.5	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	1.2	
PATH AVAILABILITY 2-WAY	percent	99.9999407	18.7 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

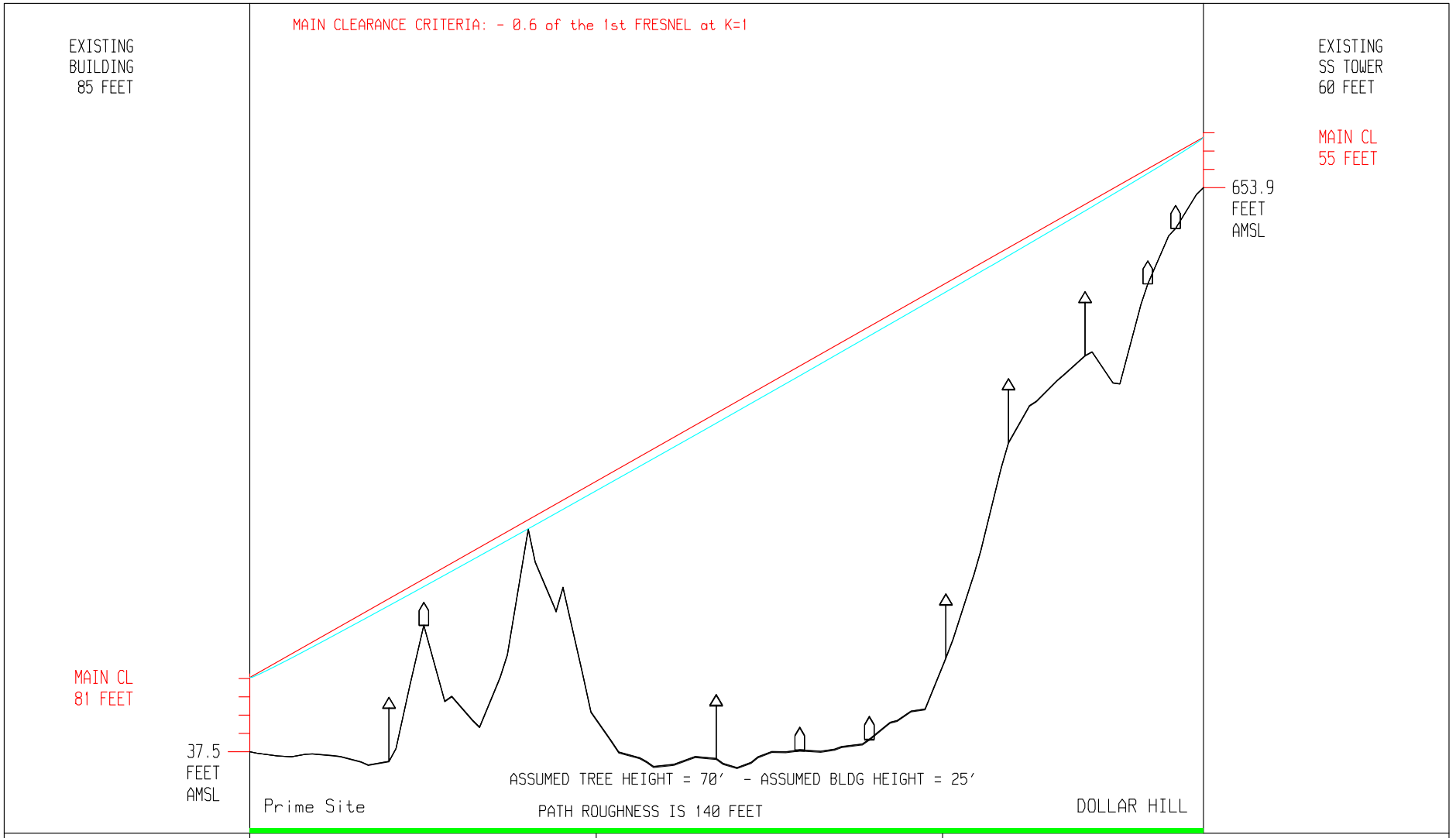
NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-41
DATE: 3 Nov 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-9
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Mt. Tamalpais	DOLLAR HILL
TROYER		NAD83 37 55 44.0 N 122 35 15.0 W	NAD83 37 58 49.6 N 122 31 45.4 W
GROUND ELEVATION	Feet	2494.0	653.9
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	15.0	20.0
MAIN FEEDER LENGTH	Feet	45.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.3	1.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	58.2	58.0
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	4.8	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	131.2	
ABSORPTION LOSS	dB	.2	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-36.1	-36.1
THERMAL FADE MARGIN	dB	35.4	35.4
MINIMUM FADE MARGIN	dB	20.0	20.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	35.4	35.4
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	2.1	2.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	4.2	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	.2	
PATH AVAILABILITY 2-WAY	percent	99.9999863	4.3 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



GROUND ELEVATION OF PROFILE
FRACTION OF 1ST FRESNEL ZONE
MAIN CENTERLINE/EVEN FRESNEL
DIVERSITY CL/ODD FRESNEL
TERRAIN OVER WATER
OBSTRUCTION OFF PATH

TERRAIN DATA BASE PROFILE
FOR PRELIMINARY PLANNING ONLY
DATA FROM: USGS 30-METER DATA

K=1
K=4/3
K=INFINITY

NOKIA

SYSTEM: MOTOROLA
ROUTE: MARIN COUNTY CA
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-42
DATE: 3 Nov 2016 SRT PAGE 1 OF 1

SYSTEM: MOTOROLA
ROUTE: Marin County HQAM
FILE: Y:\CUSTOMER\FEASIBLE\MOTOROLA\MARIN.CA\RECORD-9
REF: RAIN CURVE 68 - SAN FRANCISCO CALIFORNIA USA

Nokia Feasibility		Prime Site	DOLLAR HILL
TROYER		NAD83 38 01 09.0 N 122 32 29.5 W	NAD83 37 58 49.6 N 122 31 45.4 W
GROUND ELEVATION	Feet	37.5	653.9
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.6	38.6
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	81.0	55.0
MAIN FEEDER LENGTH	Feet	30.0	85.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	.8	2.4
OTHER FEEDER LOSSES	dB	.2	.2
WET RADOME LOSS	dB	2.5	2.5
OTHER TRANSMIT LOSSES	dB	0.0	0.0
OTHER RECEIVE LOSSES	dB	0.0	0.0
CALCULATED EIRP	dBm	58.6	57.1
MAXIMUM EIRP (PART 101)	dBm	82.9	82.9
RADIO EQUIPMENT TYPE		95MPR11-Q128F30-163	
FREQUENCY BAND	MHz	11200	
PATH LENGTH	Miles	2.8	
MEAN ANNUAL TEMPERATURE	Deg F	56.4	
ABSOLUTE HUMIDITY	g/m^3	10.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	126.4	
ABSORPTION LOSS	dB	.1	
DISPERSIVE FADE MARGIN	dB	57.0	
TRANSMIT POWER	dBm	21.0	NON-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-20.0	
RECEIVER THRESHOLD	dBm	-71.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-31.8	-31.8
THERMAL FADE MARGIN	dB	39.7	39.7
MINIMUM FADE MARGIN	dB	20.0	20.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	39.7	39.7
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	.1	.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH 2-WAY	seconds	.3	
UPFADE OUTAGE 2-WAY	seconds	0.0	
CRANE RAIN OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9999990	.3 sec
OUTAGE OBJECTIVE YEAR	percent	99.9995000	157.7 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

ASTRO 25 DYNAMIC SYSTEM RESILIENCE FUNCTIONALITY

MAXIMIZE CONTINUITY OF OPERATIONS

Public safety personnel require secure, dependable communications at all times. That's why mission critical systems must be designed from the ground up to deliver an extraordinary level of resilience and availability.

Motorola ASTRO® 25 systems employ a range of capabilities to help ensure that first responders can count on their radios to work the first time and every time. You can select from a number of availability strategies, including the Dynamic System Resilience (DSR) option, to achieve the level of survivability you require today and in the future.

For end users, continuity of operations boils down to a simple statement: whenever I need my radio it works. For the managers charged with the responsibility of making that happen, the task is not simple. No public safety agency can achieve 100% assurance that their network will survive every possible event so each agency must assess their own risk accurately and reach the right balance between system survivability and additional cost. To do this, they need to consider the complete network and the possible impact on agency operations.

CONSIDERATIONS FOR MAXIMIZING AVAILABILITY

Availability measures the percentage of time when calls are successfully completed. Several parameters should be considered to maximize availability.

Capacity – The system is designed to connect a call immediately, even during events that involve large numbers of personnel

Coverage – A first responder is able to access the system where needed

System behavior during crisis – The system is designed and tested to withstand the added user load during a crisis

Reliability – Critical communications, both voice and data, must be consistently delivered

Redundancy – Redundant configurations for key hardware and software elements are provided in the system

Recoverability – Failure scenarios are understood and recovery processes are put in place to be quickly executed

Fallback Operation – The system offers alternative modes of operation to permit responders to communicate

ASTRO 25: PROVEN OPERATIONAL PERFORMANCE

Motorola ASTRO® 25 systems are the most widely used Project 25-compliant communications solutions in the world today. System resilience has been repeatedly tested under extreme operational requirements in real-life deployments.

COVERAGE AND CAPACITY SIZED RIGHT

ASTRO 25 can be configured to meet user capacity and coverage requirements with flexible channel and site configurations, plus optimize spectrum and radio coverage so radio users can access the system when and where they need it.

Not only is the system flexible, but Motorola has developed specialized tools for voice and data traffic analysis, along with a sophisticated tool for coverage design.

OPTIMIZED FOR CRISIS OPERATIONS

Motorola development teams understand that ASTRO 25 will be the lifeline during a crisis and that the system must continue to operate when under heavy call volumes. Critical features like user priorities, emergency preemption, affiliation throttling and call burst protection must work so that thousands of users can access the system in a controlled and prioritized manner.

BUILT-IN RELIABILITY AND REDUNDANCY

Reliability is built in throughout the system. Operating systems are hardened to disable unnecessary services, provide robust system passwords and prevent unauthorized intrusions. Optional hardware and application redundancy is available for voice critical elements. And we offer an optional geographically redundant configuration in case of catastrophic loss at the core.

Built-in reliability and redundancy allow for changes and expansion to be made without impacting system operation. New base sites can be added without interrupting service to existing sites.

DESIGNED AND TESTED RECOVERY

To further guarantee availability, recovery scenarios are designed-in and tested under heavy call volumes. Transport resilience has been designed so that sites do not go into site trunking when switching to redundant site links. Control channel recovery occurs automatically in the case of station failure. Recovery media is supplied for each application, and backup and recovery applications can be optionally deployed to protect the heart of the system.

MAINTAINING OPERATIONS

Fallback operation is another key consideration in maintaining the availability of the system. ASTRO 25 offers built-in capabilities to address different failure scenarios so radio communications can be maintained if system elements have been impaired. Some of these fallback operation capabilities include site trunking communications, failsoft operation and the use of consolettes for dispatch.

PROTECTION FROM UNAUTHORIZED USERS

Multiple levels of protection are designed into the system to protect system resources, along with the voice and data information in transit.

The ASTRO 25 system can be defended from outside attacks by using a combination of firewalls, Intrusion Detection Sensors (IDS) and by creating a buffer between the customer enterprise and the radio system. ASTRO 25 system resources and voice and data information are only accessible to users with proper authorization.

HARRIS COUNTY TEXAS

Harris County is the largest county in Texas and the third largest in the U.S.

"We, as a mission critical organization, must have a system that is available 24 hours a day, seven days a week. We have lives on the line and so consequently we can't be off line. Therefore, the network was designed for high levels of control, security, and redundancy.

Tower coverage areas overlap, providing a level of redundancy with service operation. Each radio has a system ID, so if a radio is lost or stolen, it can be taken off line."

Steven Jennings, Chief Information Officer of Harris County and Executive Director of the Information Technology Center

DYNAMIC SYSTEM RESILIENCE

Not even a catastrophic failure at the system core should be allowed to interrupt communications. The ASTRO® 25 Dynamic System Resilience functionality can help to maximize availability by enabling voice and data services to remain operational even if the primary core is destroyed.

Dynamic System Resilience (DSR) is a new and efficient way to achieve geographic redundancy on an ASTRO 25 system. If an event causes a power outage, equipment failure, or physical damage to the primary core, DSR enables automatic switchover to a backup core that will continue to deliver the same high level of availability, reliability, and network management capabilities that users expect from their network.

PRIMARY AND BACKUP CORE SYSTEMS

When deploying Dynamic System Resilience, two cores are deployed: one primary and one backup. These two cores are intended to be geographically separated. Each core has call management applications, system management servers and networking equipment – everything required to control and manage an ASTRO 25 system.

For every remote site (including RF, dispatch and system management sites) that requires backup operation a link to both the primary and backup core is required. In case of a failure on one T1 and/or Ethernet site link, the remote site will continue to operate on either core as long as an alternate path remains operational.

Under normal operating conditions, ASTRO 25 cores communicate with each other, exchanging voice and control traffic as well as network health and management data. Configuration data is synchronized between the cores so both are up to date and ready to take over network operations at any time.

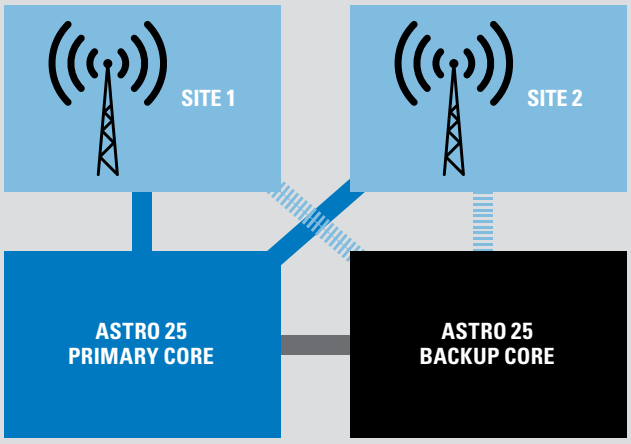
AUTOMATIC SWITCHOVER

If the primary core becomes unavailable for any reason, such as power failure, equipment fault or damage to facilities, the system switches over within seconds to the backup core. Switchover requires no action from users or network operators. Remote sites that lose communications with their controller will automatically try an alternate path to access the controller. If the original controller is still active and responds, it will continue to use this controller. If the primary controller is not available, the site will use the backup controller.

Once the primary core is restored to operation, the remote sites will not switch back automatically unless there is a subsequent failure at the backup. This prevents unnecessary switching should the restoration of service be transient or intermittent. It also allows radio system managers to choose the best time of day to switch back to the primary core, while still maintaining redundant controller capability.

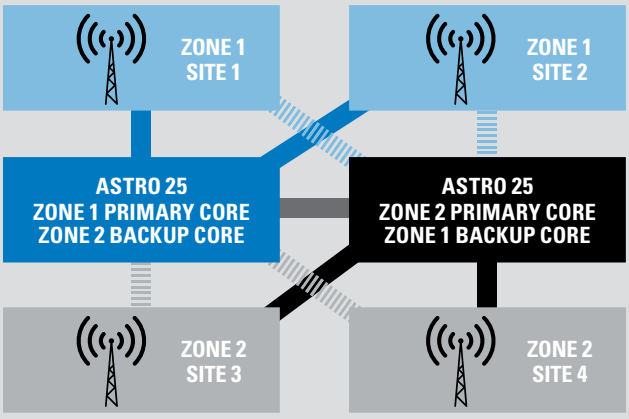
DSR is an option for both single and multi-zone ASTRO 25 systems and can be implemented at the time of initial deployment or later as the need the arises.

SINGLE-ZONE SYSTEMS



In a single-zone system with DSR, each ASTRO 25 core has full single zone site and call processing capacity. Under normal operations, the backup core maintains synchronization with the primary core so the backup core is ready to quickly become active at any time.

MULTI-ZONE SYSTEMS



In a multi-zone system with DSR, a core can be configured to act as both a primary core for one zone and a backup core for another zone. Each core has the full site control capacity.

MANUAL SWITCHOVER

If a situation such as a massive evacuation of the facility occurs, the system manager can implement a manual switchover to the backup core, maintaining full system operation from an alternate location.

DATA SERVICES AND DSR

If the ASTRO® 25 system includes data services (Integrated Data or HPD), DSR replicates all of the data sub-system equipment. In the event of a failure within the data sub-system including the communications path to the customer's data network or CEN, data service will switch to the backup equipment. Failure and recovery of data services is independent of the voice system. Failures in the data sub-system will not cause voice service to be switched over.

GRADUAL DEPLOYMENT

The DSR configuration is flexible allowing agencies to introduce it gradually as resources allow. DSR does not have to be implemented at every remote site, which may help you manage transport costs, prioritize investments and accommodate RF or console sites that do not support DSR.

A non-DSR remote site operates like any other site on the system as long as it still has connectivity to the primary core. If a failure occurs at the primary core and the non-DSR site finds an alternative path to the primary core, it will continue to operate. If all connectivity is lost, the non-DSR site will operate in site trunking mode.

Older sites and sub-systems, such as Centracom™ Elite, QUANTAR®, Smart-X and others, can still operate on the ASTRO 25 system but cannot be backed up using DSR functionality. The DSR flexible design allows system configurations to be tailored to specific system requirements.

MOTOROLA QUALITY AND SUPPORT

We understand what "mission critical" really means: the lives of your personnel and the people they protect may depend on the ability to complete a radio call. We design our products and services to deliver the continuity of operations you demand when lives are on the line. In addition to system availability, we have a reputation for outstanding quality and robust support services.

QUALITY CONTROL AND TESTING

Motorola designs and builds products with quality at every step. Our processes include extensive pre-release hardware, software and upgrade testing and a rigorous certification process for third-party hardware and software. Our close involvement with user groups and industry standards organizations puts us in direct contact with the people who use our products and their feedback helps us to continue to address the needs of first-response organizations in the real world.

Consider how we test radios. All Motorola radios and accessories undergo Military Standard 810F (MIL810) testing in 11 different categories: low pressure, high temperature, low temperature, temperature shock, solar radiation, rain, humidity, salt fog, dust, vibration and shock. This testing was developed to ensure suitability of equipment in the toughest military conditions—but we apply the same tests to civilian mission critical products.

We even go beyond MIL810 testing and conduct Accelerated Life Testing (ALT) on all our devices and accessories, simulating six years of hard usage in the field. The testing is done during early product development to improve design and quality levels, and again at final approvals to ensure that equipment will function in even the harshest outdoor environments. The tests are designed to give peace of mind that radios and accessories will survive the inevitable knocks and drops, and still keep working.

SUPPORTING SERVICES

Motorola also offers a full portfolio of services for every stage in a system's life cycle. We stand by you at every point from needs identification and system design through financing, deployment, training, ongoing maintenance and future upgrades/expansions.

Our comprehensive network planning services help you design a solution tailored to achieve the desired level of resilience and redundancy. Once a system is operational, we can provide network monitoring and troubleshooting services to keep it at peak performance. Motorola's Network Operation Center is staffed 24 x 7 every day of the year and has the ability to remotely identify, diagnose and often fix network problems. When an element cannot be fixed remotely, Motorola repair technicians can travel to the site.

CONCLUSIONS

Continuity of operations is a key initiative for Motorola. We apply everything we have learned in over eight decades of working with public safety agencies to provide comprehensive, dependable communications support for agencies around the world. The ASTRO 25 system is designed from the ground up to meet the unique mission critical requirements of public safety.

With over 300 mission critical trunked systems deployed, Motorola ASTRO 25 systems are fully proven for mission critical operations, having survived hurricanes, widespread power failures and other events that crippled less robust networks.

For more information about Motorola's ASTRO 25 solution for mission critical networks, please contact your Motorola representative or visit **motorola.com/ASTRO25**.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. **motorolasolutions.com**

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MOTOROLA

ALCATEL-LUCENT 7705 SERVICE AGGREGATION ROUTER
RELEASE 6.2

The Alcatel-Lucent 7705 Service Aggregation Router (SAR) portfolio delivers industry-leading IP/MPLS and pseudowire capabilities in compact platforms that can reliably and securely aggregate multiple media, service and transport protocols on an economical packet transport infrastructure.

7705 SAR-18

7705 SAR-8

7705 SAR-H

7705 SAR-M

7705 SAR-A

7705 SAR-F

7705 SAR-W

7705 SAR-Wx

7705 SAR-Hc

The Alcatel-Lucent 7705 SAR portfolio is optimized for multiservice adaptation, aggregation and routing, especially on a modern Ethernet and IP/MPLS infrastructure. Leveraging the powerful Alcatel-Lucent Service Router Operating System (SR OS) and the 5620 Service Aware Manager (SAM), the 7705 SAR is available in compact, low-power-consumption indoor and outdoor platforms that deliver highly available services over resilient and flexible network topologies.

The Alcatel-Lucent 7705 SAR is well suited to the aggregation and backhaul of mobile traffic, including 2G, 3G, Long Term Evolution (LTE), LTE Advanced, Land Mobile Radio (LMR) and Private Mobile Radio (PMR). This provides cost-effective scaling and supports the transformation to IP/MPLS networking. Business services modernization is supported in the transition from legacy to consolidated, packet-based operation. Significant reductions in equipment footprint are achievable, along with reduced energy costs. Power utilities, public safety agencies and transportation operators, and government organizations can deploy the Alcatel-Lucent 7705 SAR for reliable and secure support of legacy and modern IP and Ethernet-based services.

FEATURES

Service aggregation and networking

The Alcatel-Lucent 7705 SAR can employ pseudowire encapsulation methods to map services end to end. This helps ensure that the key attributes of each service are maintained, while using a cost-effective packet environment to aggregate services. IP routing and forwarding and Virtual Private LAN Service (VPLS) are also supported.

The Alcatel-Lucent 7705 SAR portfolio provides support for Asynchronous Transfer Mode (ATM), inverse multiplexing over ATM (IMA), MC MLPPP, Ethernet, Frame Relay, HDLC and TDM traffic. Support for IP VPNs allows the separation of Layer 3 traffic among different groups of users or organizations. Analog voice encoding and transport are available on the Alcatel-Lucent 7705 SAR-8 and the 7705 SAR-18. Voiceband analog traffic can be carried over IP/MPLS network infrastructure between two analog devices that are using traditional T1/E1 network interfaces or over Ethernet or MLPPP interfaces.

Highly flexible network infrastructure options

For maximum deployment flexibility, the Alcatel-Lucent 7705 SAR portfolio supports a broad range of integrated media including fiber, copper and microwave. Tunneling options include the use of MPLS, IP or Generic Routing Encapsulation (GRE) for aggregated traffic. Efficient LDP-based dynamic signaling, static provisioning of MPLS tunnels, and pseudowires are also supported. GRE and IP tunneling allow low-cost, ubiquitous IP networks to be used for backhauling; for example, for the transport of High Speed Packet Access (HSPA) off-loaded traffic using DSL access media. The Alcatel-Lucent 7705 SAR can be configured as either a Label Edge Router (LER) or a Label Switched Router (LSR). The 7705 SAR includes a strong suite of traffic-engineering and resiliency capabilities, using functions such as Constraint-based Shortest Path First (CSPF) routing, Fast Reroute (FRR), primary and secondary LSPs, and redundant pseudowires.

Quality of service (QoS) and traffic management

Traffic flows with different QoS requirements are identified at the access and marked in-line with the appropriate QoS metrics. Traffic classification and marking are based on a wide range of categories at Layer 1, Layer 2, Layer 2.5 and Layer 3. To ensure fairness, the Alcatel-Lucent 7705 SAR's traffic management policies use detailed classification and hierarchical scheduling mechanisms including: minimum/maximum, queue type-based weighted round robin, and strict priority and profiled scheduling, as well as multi-tier policing to differentiate and prioritize individual services and flows. Bursty ingress flows can be selectively shaped as needed to improve application throughput and optimize resource usage.

Operations, administration and maintenance (OAM)

To promote rapid deployment and high service availability, the Alcatel-Lucent 7705 SAR portfolio has a full set of OAM features including:

- LSP ping
- LSP traceroute
- Service distribution path (SDP) ping
- Virtual circuit connectivity verification (VCCV)
- Ethernet OAM functions, such as:
  - ¬ 802.3ah: Ethernet in the First Mile
  - ¬ 802.1ag: Connectivity Fault Management
  - ¬ Y.1731: Ethernet OAM mechanisms for fault and performance management
- IP OAM functions using Two-Way Active Measurement Protocol (TWAMP)

These features, when used in conjunction with the Alcatel-Lucent 5620 Service Aware Manager (SAM) portfolio, ensure rapid fault detection, as well as efficient troubleshooting. In particular, SLAs can be proactively monitored by the Service Aware Agent (SAA). For example, high-accuracy, one-way delay measurements can be used to closely assess ongoing network latency. This powerful SAA capability allows the specification of test suites, policies and schedules. The tests are then auto-created, and the test results are automatically compared to predefined SLA metrics. Any problems detected are automatically reported through the SAA to operations staff. An auto-discovery protocol (ADP) can provide rapid automated commissioning of remote devices.

Synchronization

The Alcatel-Lucent 7705 SAR portfolio supports external reference timing, line timing, adaptive clock recovery (ACR) and differential clock recovery (DCR) timing, synchronous Ethernet, and timing distribution using 1588v2. The 1588v2 Master Clock and Boundary Clock functions are also supported. In addition, the 7705 SAR-M, 7705 SAR-W, 7705 SAR-Wx, 7705 SAR-H, 7705 SAR-Hc and 7705 SAR-A support Transparent Clock and Time of Day capabilities. The 7705 SAR-H also supports synchronization output according to IRIG-B (B000/B127). The 7705 SAR-H and certain 7705 SAR-Wx variants include integrated Global Positioning System (GPS) receiver capability. This can allow 1588v2 grandmasters to be enabled for frequency, phase and time distribution.

Timing accuracy and high performance over packet solutions are enabled with a combination of built-in architectural features, Bell Labs' algorithms and powerful QoS mechanisms, which minimize the delay and delay variation experienced by synchronization traffic. A built-in Stratum-3 clock is provided to assist with synchronization maintenance if a primary source is unavailable.

Security

The Alcatel-Lucent 7705 SAR portfolio incorporates security features to maintain network integrity in the face of cyber-attacks. Access control lists, filters and authentication of signaling messages provide mechanisms to protect management, control and data planes, helping to prevent session hijacking, spoofing, denial of service attacks and other malicious behaviors. Strong access security is provided by Simple Network Management Protocol (SNMP) v3 confidentiality, integrity features and Secure Shell (SSH) and IPSec encryption. . Network address translation (NAT) capabilities allow private networking schemes to be carried across a public infrastructure. IPsec on the Gigabit Ethernet adapter cards provides the ability to establish highly secure traffic streams. IPSec and NAT functionality provide the flexibility to backhaul traffic over the public internet for example. Dynamic Host Configuration Protocol (DHCP) server can be used to facilitate the automatic configuration of aggregated small cell sites.

These security features enable the 7705 SAR portfolio to be part of a North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) compliant network.

FEATURES AND BENEFITS

FEATURES	BENEFITS
Extension of dynamic service routing IP/MPLS capabilities to the remote site, hubs and network edge in compact form factors with low power consumption.	Modular, flexible architecture alleviates the burden of complex pre-engineering and future scenario planning. Compact, rugged form factors allow deployment in remote sites including outdoor installation.
Dense adaptation of multiple converged services onto an efficient, economical packet infrastructure with appropriate QoS treatment	Energy-efficient platforms carrying multiple traffic types reduce power and cooling costs. Powerful QoS improves the user experience.
Powerful, service-aware OAM capabilities, complemented by the Alcatel-Lucent 5620 SAM portfolio, for GUI-based network and element configuration, provisioning, and fault and performance management	Rapid fault detection and powerful commissioning and troubleshooting tools can improve operations staff's productivity and reduce network downtime, helping to reduce operations costs and improve end-user satisfaction.
Cost-effective migration from TDM-based backhaul to economical and flexible IP/MPLS-based aggregation and routing, leveraging a wide range of first-mile media	Transition from TDM-based connectivity to modern Ethernet and/or IP-based networking infrastructures can reduce recurring operating expenditures such as line lease costs.
Resiliency and redundancy, including hitless control and switch module failover (Alcatel-Lucent 7705 SAR-8 and 7705 SAR-18), synchronization redundancy, network uplink resiliency and redundancy of power feeds, plus temperature hardening (except Alcatel-Lucent 7705 SAR-18)	Advanced resiliency features can improve network uptime, enhancing customer retention and increasing revenues for critical services.
Breadth of synchronization solutions with flexible operation, redundancy and independent validation of accuracy	Accurate synchronization allows cost-effective deployment over packet infrastructure and improves the user experience (for example, less data loss and fewer dropped calls in mobile applications).

HARDWARE OVERVIEW

The Alcatel-Lucent 7705 SAR is available in a range of chassis types to suit a broad range of applications. Tables 1, 2 and 3 provide a summary of the technical specifications for each platform within the portfolio. The 7705 SAR product line supports an extensive range of adapter cards and modules, optimized to address different network and service requirements.

Select 7705 SAR products are also available with conformal coating as an orderable option to provide added protection against environmental contaminants.

Alcatel-Lucent 7705 SAR adapter cards

Each of the six adapter card slots in the 7705 SAR-8, or the twelve adapter card slots in the right side of the 7705 SAR-18, can be used to house the following adapter card types:

- 6-port Ethernet 10Gb/s adapter card supporting two ports of 10 Gigabit Ethernet (1000/10000BASE) with SFP+ connectors and four ports of 1 Gigabit Ethernet (100/1000BASE) via SFP connectors
- 4-port OC-3/STM-1 clear channel adapter card, supporting ATM, POS and IP services with ports configurable for SONET or SDH operation
- 2-port OC-3/STM-1 channelized adapter card, supporting ATM, ATM IMA, TDM, PPP/MLPPP and IP services with ports configurable for SONET or SDH operation
- 4-port OC-3/STM-1 channelized adaptor card supporting TDM and PPP/MLPPP with ports configurable for SONET or SDH operation
- 16-port ASAP T1/E1 adapter card supporting ATM, ATM IMA, TDM, multiclass PPP/MLPPP and IP services
- 32-port ASAP T1/E1 adapter card supporting ATM, ATM IMA, TDM, multiclass PPP/MLPPP and IP services
- 8-port Ethernet adapter card supporting six ports of auto-sensing 10/100BASE-TX ports, plus two extra ports supporting 10/100/1000BASE Ethernet with SFP connectors
- 4-port DS3/E3 adapter card supporting clear channel and channelized (on DS3 only) PPP and ATM service (on DS3 only)
- 6-port E&M adapter card supporting selectable µ-Law or A-Law encoding
- 12-port Serial Data Interface (SDI) card, which can be configured for RS-232, V.35 or X.21 operation
- An auxiliary alarm card with 24 digital alarm inputs, 2 analog inputs and 8 output relays
- A range of CWDM passive optical adapter cards. Add/drop cards are available with selected wavelengths.
- 8-port Gigabit Ethernet (GigE) adapter card with SFP connectors
- Microwave power injector card
- Packet microwave card with microwave-aware Ethernet ports
- Voice and teleprotection card supporting 2 FXS and 2 FXO ports for analog voice, 2 G.703 co-directional ports and 2 C37.94 optical teleprotection ports for low-latency teleprotection
- 8-port FXO voice adapter card
- 6-port FXS voice adapter card
- 2-port 10GBASE Ethernet ring adapter card with XFP connectors
- Integrated Services adapter card (Multi-Drop Data Bridging application – MDDB)

Alcatel-Lucent 7705 SAR-18 x-adapter cards

The four slots in the left side of the 7705 SAR-18 can be used to house the following x-adapter card:

- 1-port 10 Gb/s /10-port 1 Gb/s card, configurable to operate in one of the following modes:
  - ¬ 10-port 1GigE SFP
  - ¬ 1-port 10GigE SFP+

Alcatel-Lucent 7705 SAR-M Modules

The expansion module slot, provided on two of the 7705 SAR-M variants, can support one of the following plug-in modules:

- Integrated GPON ONT
- DSL Combo Module (DCM) supporting four pairs of G.SHDSL, plus two pairs of ADSL2/2+/ VDSL2 with ATM/PTM bonding
- xDSL module supporting up to eight pairs of PTM bonding over ADSL2/ADSL2+/VDSL2
- Integrated CWDM Optical Add-Drop Mux (OADM) module
- 2-port 10GBASE ring module

Alcatel-Lucent 7705 SAR-H Modules

The two expansion module slots, provided on the 7705 SAR-H, can support the following plug-in modules:

- Combination T1/E1/RS-232 module with 2 T1/E1 ports and 2 RS-232 asynchronous serial ports
- GPS receiver module

Table 1. Alcatel-Lucent 7705 SAR portfolio chassis-dependent specifications (part 1)

	7705 SAR-F	7705 SAR-M*	7705 SAR-8	7705 SAR-18
Capacity for adapter cards/modules per chassis	–	Certain 7705 SAR-M variants have one expansion module slot*	Six adapter card slots	12 (2.5 Gb/s full duplex) adapter card slots + 4 (10 Gb/s full duplex) XMDA adapter card slots
Built-in service/ network interfaces	16 x T1/E1 ASAP ports, 6 x 10/100BASE-TX auto-sensing Ethernet, 2 x 10/100/1000BASE SFP ports	*	–	–
Redundancy and resiliency	Synchronization, uplinks, MPLS tunnels, pseudowires, power feeds, cooling fans	Synchronization, uplinks, MPLS tunnels, pseudowires, power feeds, cooling fans*	Control, fabric, synchronization, uplinks, MPLS tunnels, pseudowires, power feeds, cooling fans	Control, fabric, synchronization, uplinks, MPLS tunnels, pseudowires, power feeds, cooling fans
Physical dimensions	• Height: 1 RU 4.45 cm (1.75 in.) • Depth: 25.4 cm (10 in.) • Width: 43.9 cm (17.3 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth)	• Height: 1 RU 4.4 cm (1.73 in.) • Depth: 24.1 cm (9.5 in.) • Width: 44.1 cm (17.4 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth)	• Height: 2 RU, 8.9 cm (3.5 in.) • Depth: 26.4 cm (10.4 in.) • Width: 44.5 cm (17.5 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth)	• Height: 10 RU, 44.5 cm (17.5 in.) • Depth: 30 cm (11.8 in.) • Width: 43.9 cm (17.3 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth)
Power	• Two feeds: -48/-60 V DC, or two feeds: +24 V DC • AC power solutions available: 100 V AC to 240 V AC , 50/60 Hz	• Two feeds: -48/-60 V DC, or two feeds: +24V DC • AC power solutions available: 100 VAC to 240 V AC , 50/60 Hz	• Two feeds: -48/-60 V DC, or two feeds: +24 V DC • AC power solutions available: 100 VAC to 240 V AC , 50/60 Hz	• Two feeds: -48/-60 V DC • AC power solutions available: 100 V AC to 240 V AC , 50/60 Hz
Cooling	Built-in five-fan array with redundancy	Built-in five-fan array with redundancy**	One tray of eight fans with redundancy	One tray of eight fans with redundancy
Operating environment	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 5% to 95%, non-condensing	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 5% to 95%, non-condensing	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 5% to 95%, non-condensing	• Normal operating temperature range: -5°C to +45°C (23°F to 113°F) sustained, -5°C to +55°C (23°F to 131°F) extended (96 hours) • Normal humidity: 5% to 85%, non-condensing • Short-term (96 hours) extended humidity range: 5% to 95%, non-condensing
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)

* See Table 4, "Alcatel-Lucent 7705 SAR-M chassis variants" for details on 7705 SAR-M chassis option characteristics.
** Only 7705 SAR-M variants with active cooling have fans and fan redundancy. Passively cooled 7705 SAR-M variants have no fans.

Table 2. Alcatel-Lucent 7705 SAR portfolio chassis-dependent specifications (part 2)

	7705 SAR-H	7705 SAR-Hc	7705 SAR-A***
Capacity for adapter cards/modules per chassis	Two expansion module slots capable of housing 7705 SAR-H specific modules	–	–
Built-in service/ network interfaces	• 4 x 10/100/1000BASE-TX ports (PoE/PoE+ capable) • 2 x 100/1000BASE SFP ports • 2 x combo 100/1000 Ethernet ports (SFP/RJ45)	• Two 10/100/1000BASE-TX Ethernet ports (PoE/PoE+ capable) • Two 10/100/1000BASE-TX Ethernet ports • Two 100/1000BASE ports (SFP) • Two RS-232 (async) ports	***
Redundancy and resiliency	Synchronization, uplinks, MPLS tunnels, pseudowires	Synchronization, uplinks, MPLS tunnels, pseudowires	Synchronization, uplinks, MPLS tunnels, pseudowires
Physical dimensions	• Height: 1.7 RU 7.62 cm (3 in.) • Depth: 25.4 cm (10 in.) • Width: 43.9 cm (17.3 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth) • Wall/panel mount	• Height:17.8 cm (7 in.) • Width: 9.14 cm (3.6 in.) • Depth: 15,24 cm (6 in.) • DIN Rail and Wall/Panel mountable	• Height: 1 RU 4.4 cm (1.73 in.) • Depth: 24.1 cm (9.5 in.) • Width: 44.1 cm (17.4 in.) • Rack mountable in a 48.2-cm rack, 30-cm depth (standard 19-in. equipment rack, 12-in. depth)
Power	• Low voltage DC variant: two feeds: +24/-48 V DC • High voltage AC/DC variant: ¬ Rated voltages: 110-250VDC, 100 to 240VAC, 50/60 Hz	• +/-20VDC to 75 VDC • HV power solution available: 100 V AC to 240 V AC, 50/60 Hz; 88 to 300VDC	• Two feeds: -48/-60 V DC • AC power solutions available: 100 to 240 V AC, 50/60 Hz
Cooling	Passively cooled	Passively cooled	Passively cooled
Operating environment	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 5% to 95%, non-condensing	• Normal operating temperature range: -40°C to +70°C (-40°F to +158°F) sustained with a minimum airflow rate of 0.5 m/s, -40°C to +65°C (-40°F to +149°F) in a still air environment • Normal humidity: 5% to 95%, non-condensing	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 5% to 95%, non-condensing
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)

*** See Table 5, "Alcatel-Lucent 7705 SAR-A chassis variants" for details on 7705 SAR-A option characteristics

Table 3. Alcatel-Lucent 7705 SAR portfolio chassis-dependent specifications (part 3)

	7705 SAR-W	7705-SAR-WX****
Capacity for adapter cards/ modules per chassis	–	–
Built-in service/ network interfaces	5 x Gigabit Ethernet ports: 3 are SFP and 2 are RJ45 combo ports. A GPON ONT SFP is available. The RJ45 ports optionally support power over Ethernet plus (PoE+)	****
Redundancy and resiliency	Synchronization, uplinks, MPLS tunnels, pseudowires	Synchronization, uplinks, MPLS tunnels, pseudowires
Physical dimensions	• Height: 6.6 cm (2.6 in.) • Depth: 25.4 cm (10 in.) • Width: 38.1 cm (15 in.)	• Height: 9.7 cm (3.8 in.) • Depth: 16.5 cm (6,5in.) • Width: 35.6 cm (14 in.)

Table 3. Alcatel-Lucent 7705 SAR portfolio chassis-dependent specifications (part 3) (continued)

	7705 SAR-W	7705-SAR-Wx****
Power	• Power IN ¬ Universal power (AC, AC with DC backup or DC) ¬ AC: 100 - 240 V AC, 50/60 Hz with 1s hold-up ¬ DC: +24/-48/-60 V DC with 1s hold-up • Power OUT ¬ PoE+ with 1s hold-up on all RJ45 Ethernet ports	****
Cooling	Passively cooled	Passively cooled
Operating environment	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 2% to100%, condensing • Element-proof enclosure/connectivity	• Normal operating temperature range: -40°C to +65°C (-40°F to +149°F) sustained • Normal humidity: 2% to100%, condensing • Element-proof enclosure/connectivity
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)	40°C to +70°C (-40°F to +158°F)

**** See Table 6, "Alcatel-Lucent 7705 SAR-Wx chassis variants" for details on 7705 SAR-Wx option characteristics

There are four variants of the 7705 SAR-M. Each column in table 3 denotes the supported capabilities for one of these configurations.

Table 4. Alcatel-Lucent 7705 SAR-M chassis variants

ETHERNET PORTS BUILT-IN	7 : 4 X 10/100/1000BASE WITH SFP 3 X 10/100/1000BASE-TX)	7 : 4 X 10/100/1000BASE WITH SFP 3 X 10/100/1000BASE-TX)	7 : 4 X 10/100/1000BASE WITH SFP 3 X 10/100/1000BASE-TX)	7 : 4 X 10/100/1000BASE WITH SFP 3 X 10/100/1000BASE-TX)
T1/E1 ports built-in	16	0	16	0
Module slot support	Yes	Yes	No	No
Cooling	Active	Active	Passive	Passive

There are two variants of the 7705 SAR-A. Each column in table 5 denotes the supported capabilities for one of these configurations.

Table 5. Alcatel-Lucent 7705 SAR-A chassis variants

ETHERNET PORTS BUILT-IN	12: 4 X 10/100/1000 COMBO (RJ-45 OR SFP) 4 X 10/100/1000BASE SFP 4 X 10/100BASE-TX	12: 4 X 10/100/1000 COMBO (RJ-45 OR SFP) 4 X 10/100/1000BASE SFP 4 X 10/100BASE-TX
T1/E1 ports built-in	8	0
Module slot support	No	No
Cooling	Passive	Passive

There are six variants of the 7705 SAR-Wx. Each column in table 6 denotes the supported capabilities for one of these configurations.

Table 6. Alcatel-Lucent 7705 SAR-Wx chassis variants

ETHERNET PORTS BUILT-IN	3 X SFP, 2 X RJ45	3 X SFP, 2 X RJ45	3 X SFP, 1 X RJ45	3 X SFP, 1 X RJ45	3 X SFP, 2 X RJ45	3 X SFP, 2 X RJ45
DSL ports built-in	-	-	4 with bonding	4 with bonding	-	-
GPS support	No	Yes	No	Yes	No	Yes
Power	Power IN AC: 100 - 240 V AC, 50/60 Hz	Power IN AC: 100 - 240 V AC, 50/60 Hz	Power IN AC: 100 - 240 V AC, 50/60 Hz	Power IN AC: 100 - 240 V AC, 50/60 Hz	Power IN AC: 100 - 240 V AC, 50/60 Hz Power OUT PoE+ on one RJ45 Ethernet port	Power IN AC: 100 - 240 V AC, 50/60 Hz Power OUT PoE+ on one RJ45 Ethernet port

A GPON ONT SFP is also available

Table 7. EMC Standards Compliance

EMC INDUSTRIAL STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
IEEE 1613:2009 + A1:2011	IEEE Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Electric Power Substations					X Performance Class 1 (Class 2 w/ Optics Interfaces only)		X Performance Class 2	X Performance Class 2		
IEEE 1613.1-2013	IEEE Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Transmission and Distribution Facilities					X Zone B; Performance Class 1 (Class 2 w/ Optics interfaces only)		X Zone B; Performance Class 2	X Zone B; Performance Class 2		
IEEE Std C37.90	IEEE Standard for relays and relay systems associated with Electric Power Apparatus					X		X	X		
IEEE Std C37.90.1	Surge Withstand Capability (SWC) Tests					X		X	X		
IEEE Std C37.90.2	Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers					X		X	X		
IEEE Std C37.90.3	IEEE Standard Electrostatic Discharge Tests for Protective Relays					X		X	X		
EN 50121-4: 2006	Electromagnetic Compatibility – Part 4: Emission and Immunity of the Signalling and Telecommunications Apparatus		X	X	X	X		X	X	X	X
IEC 62236-4:2008	Electromagnetic Compatibility – Part 4: Emission and Immunity of the Signalling and Telecommunications Apparatus		X	X	X	X		X	X	X	X
IEC 61000-6-2:2005	Generic standards – Immunity for industrial environments		X	X	X	X		X	X	X	X
IEC 61000-6-4:2006	Generic standards – Emissions standard for industrial environments		X	X	X	X		X	X	X	X
IEC TS 61000-6-5	Immunity for power station and substation environments					X		X	X		
IEC 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements					X		X	X		
IEC/AS 60870.2.1	Telecontrol equipment and systems. Operating conditions. Power supply and electromagnetic compatibility					X		X	X		

Table 8. EMC Standards Compliance (continued)

EMC REGULATORY AND CUSTOMER STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
IEC 61000-4-2	Electrostatic discharge immunity test	X	X	X	X	X	X	X	X	X	X
IEC 61000-4-3	Radiated electromagnetic field immunity test	X	X	X	X	X	X	X	X	X	X
IEC61000-4-4	Electrical fast transient/ burst immunity test	X	X	X	X	X	X	X	X	X	X
IEC 61000-4-5	Surge immunity test	X	X	X	X	X	X	X	X	X	X
IEC 61000-4-6	Immunity to conducted disturbances	X	X	X	X	X	X	X	X	X	X
IEC61000-4-8	Power frequency magnetic field immunity test					X		X	X		
IEC61000-4-9	Pulse Magnetic field immunity test					X		X	X		
IEC 61000-4-10	Damped Oscillatory Magnetic Field					X		X	X		
IEC 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X	X w/ external AC/DC PS	X	X
IEC 61000-4-12	Oscillatory wave immunity test					X		X	X		
IEC 61000-4-16	Conducted immunity 0 Hz - 150 kHz					X		X	X		
IEC61000-4-17	Ripple on d.c. input power port immunity test					X		X	X		
IEC 61000-4-18	Damped oscillatory wave immunity test					X		X	X		
IEC 61000-4-29	Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests					X		X	X		
IEC 61000-3-2	Limits for harmonic current emissions (equipment input current <16A per phase)	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X	X w/ external AC/DC PS	X	X
IEC 61000-3-3	Limits for voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <16A	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X w/ external AC/DC PS	X	X w/ external AC/DC PS	X	X

EMC REGULATORY AND CUSTOMER STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
ITU-T K.20 (DC Ports)	Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents		X	X	X	X	X	X	X		
ETSI 300 132-2	Power supply interface at the input to telecommunications and datacom (ICT) equipment; Part 2: Operated by -48 V direct current (dc)	X	X	X	X	X	X	X	X	X	
EN300 386	Telecommunication network equipment; ElectroMagnetic Compatibility (EMC)	X	X	X	X	X	X	X	X	X	X
ES 201 468	Electromagnetic compatibility and Radio spectrum matters (ERM); Additional ElectroMagnetic Compatibility (EMC) requirements and resistibility requirements for telecommunications equipment for enhanced availability of service in specific applications					X	X				
Telcordia GR-1089-CORE	EMC and Electrical Safety – Generic Criteria for Network Telecommunications Equipment	X	X	X	X	X	X	X	X	X	X
AS/NZS CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class B	X Class B
FCC Part 15, Subpart B	Radio Frequency devices- Unintentional Radiators (Radiated & Conducted Emissions)	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class B	X Class B
ICES-003	Information Technology Equipment (ITE) – Limits and methods of measurement	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class B	X Class B
EN 55022	Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class B	X Class B
CISPR 22	Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class A	X Class B	X Class B
KC Notice Emission (KN22) and Immunity (KN24) (South Korea)	EMS standard: NRRA notice		X	X	X	X	X	X	X		

Table 9. Environmental Regulations Compliance

ENVIRONMENTAL STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
IEEE 1613:2009 + A1:2011	Environmental and Testing Requirements for Communications Networking Devices					X (note 1)		X	X		
IEC 61850-3	Communication networks and systems for power utility automation - Part 3: General requirement					X (note 2)		X (note 2)	X (note 2)		
IEC60068-2-1	Environmental testing – Part 2-1: Tests – Test A: Cold	X	X	X	X	X	X	X	X	X	X
IEC60068-2-2	Environmental testing – Part 2-2: Tests - Test B: Dry heat	X	X	X	X	X	X	X	X	X	X
IEC60068-2-30	Environmental testing – Part 2: Tests. Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)	X	X	X	X	X	X	X	X	X	X
IEC60255-21-2	Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section Two: Shock and bump tests					X		X	X		
ETSI 300 753 Class 3.2	Acoustic noise emitted by telecommunications equipment	X	X	X	X	X	X	X	X	X	X
Telcordia GR-63-CORE	NEBS Requirements: Physical Protection	X	X	X	X	X	X	X	X	X	X
ETSI EN 300 019-2-1 v2.1.2, Class 1.2	Specification of environmental tests; Storage	X	X	X	X	X	X	X	X	X	X
ETSI EN 300 019-2-2 V2.1.2, class 2.3	Specification of environmental tests; Transportation	X	X	X	X	X	X	X	X	X	X
ETSI EN 300 019-2-3 V2.2.2, class 3.2	Specification of environmental tests; Stationary use at weatherprotected locations	X	X	X	X	X	X	X	X		
ETSI EN 300 019-2-4 v2.2.2 class T4.1	Specification of environmental tests; Stationary use at non-weatherprotected locations									X	X

ENVIRONMENTAL STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
Telcordia GR-3108-CORE	Generic Requirements for Network Equipment in the Outside Plant (OSP)	X Class 2	X Class 2	X Class 2	X Class 2	X Class 2		X Class 2	X Class 2	X Class 4	X Class 4
"GR-3108 Class 3 Section 6.2 IEC 60068-2-52 - Severity 3 MIL-STD-810G Method 509.5 EN 60721-3-3 Class 3C4 EN 60068-2-11: Salt Mist EN50155 Class ST4"	Conformal coating (Note 3)			X		X		X	X		

Note 1: Forced air system, uses fans
Note 2: Normal environmental conditions as per IEC61850-3 ed.2
Note 3: Conformal coating is available as an orderable option.

Table 10. Safety Standards Compliance

SAFETY STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
UL/CSA 60950-1	Information technology equipment - Safety - Part 1: General requirements	X	X	X	X	X	X	X	X	X	X
IEC/EN 60950-1	Information technology equipment - Safety - Part 1: General requirements	X	X	X	X	X	X	X	X	X	X
AS/NZS 60950-1	Information technology equipment - Safety - Part 1: General requirements	X	X	X	X	X	X	X	X	X	X
IEC/EN 60825-1 and 2	Safety of laser products - Part 1: Equipment classification and requirements Part 2: Safety of optical fibre communication systems (OFCS)	X	X	X	X	X	X	X	X	X	X
FDA CDRH 21-CFR 1040	PART 1040 Performance Standards for Light-Emitting Products	X	X	X	X	X	X	X	X	X	X
UL/CSA 60950-22	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors									X	X
CSA –C22.2 No.94	Special Purpose Enclosures									X	X
UL50	Enclosures for Electrical Equipment, Non-Environmental Considerations									X	X

SAFETY STANDARDS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
IEC/EN 60950-22	Information technology equipment. SafetyEquipment installed outdoors									X	X
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)	X IP20	X IP40	X IP20	X IP40	X IP20	X IP20	X IP40	X IP40	X IP65	X IP65

Table 11. Telecom Regulations Compliance

TELECOM INTERFACE COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
IC CS-03 Issue 9	Compliance Specification for Terminal Equipment, Terminal Systems, Network Protection Devices, Connection Arrangements and Hearing Aids Compatibility	X	X	X	X	X	X	X			
ACTA TIA-968-B	Telecommunications - Telephone Terminal Equipment - Technical Requirements for Connection of Terminal Equipment to the Telephone Network	X	X	X	X	X	X	X			
AS/ACIF S016 (Australia)	Requirements for Customer Equipment for connection to hierarchical digital interfaces	X	X	X	X	X	X	X			
ATIS-06000403	Network and Customer Installation Interfaces-DS1 Electrical Interfaces	X	X	X	X	X	X	X			
ANSI/TIA/EIA-422-B (RS422)	Electrical Characteristics for balanced voltage digital interfaces circuits					X	X				
ITU-T G.813	Timing characteristics of SDH equipment slave clock (SEC)	X	X	X	X	X	X				
ITU-T G.825	The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)					X	X				
ITU-T G.703	Physical/electrical characteristics of hierarchical digital interfaces	X	X	X	X	X	X	X			

TELECOM INTERFACE COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
ITU-T G.712 (E&M)	Transmission performance characteristics of pulse code modulation channels					X	X				
ITU-T G.957	Optical interfaces for equipments and systems relating to the synchronous digital hierarchy					X	X				
ITU-T V.24 (RS232)	List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)					X	X	X	X		
ITU-T V.28 (V35)	Electrical characteristics for unbalanced double-current interchange circuits					X	X				
ITU-T V.36 (V35)	Modems for synchronous data transmission using 60-108 kHz group band circuits					X	X				
ITU-T V.11 / X.27 (RS422)	Electrical characteristics for balanced double current interchange circuits operating at data signalling rates up to 10 Mbit/s					X	X				
ITU-T X.21 (RS422)	Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks					X	X				
ITU-T 8262 (Synch E)	Timing characteristics of synchronous Ethernet equipment slave clock (EEC)		X	X	X	X	X	X	X	X	X
IEEE 802.3ab (Ethernet)	Physical Layer Parameters and Specifications for 1000 Mb/s Operation Over 4-Pair of Category 5 Balanced Copper Cabling, Type 1000BASE-T	X	X	X	X	X	X	X	X	X	X
IEEE 802.3at (POE)	Data Terminal Equipment Power via the Media Dependent Interfaces Enhancements							X	X	X	X

Table 12. Directives, Regional Approvals and Certifications Compliance

DIRECTIVES, REGIONAL APPROVALS AND CERTIFICATIONS COMPLIANCE											
STANDARD	**TITLE**	**7705 SAR-F**	**7705 SAR-A**	**7705 SAR-M**	**7705 SAR-M FANLESS**	**7705 SAR-8**	**7705 SAR-18**	**7705 SAR-H**	**7705 SAR-Hc**	**7705 SAR-W**	**7705 SAR-Wx**
EU Directive 1999/5/EC R&TTE	Radio and Telecommunication Terminal Equipment (R&TTE) OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL	X	X	X	X	X	X	X	X	X	X
EU Directive 2004/108/EC EMC	Electromagnetic Compatibility (EMC)	X	X	X	X	X	X	X	X	X	X
EU Directive 2006/95/EC LVD	Low Voltage Directive (LVD)	X	X	X	X	X	X	X	X	X	X
EU Directive 2002/96/EC WEEE	Waste Electrical and Electronic Equipment (WEEE)	X	X	X	X	X	X	X	X	X	X
EU Directive 2002/95/EC RoHS	Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)	X	X	X	X	X	X	X	X	X	X
EU Directive 2011/65/EU RoHS2	Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2)	X	X	X	X	X	X	X	X	X	X
CE Mark		X	X	X	X	X	X	X	X	X	X
CRoHS Logo; Ministry of Information Industry order No.39		X	X	X	X	X	X	X	X	X	X
China (MII NAL) Network Access License			X	X		X	X			X	
South Korea (KC Mark)			X	X	X	X	X	X	X		
Australia (RCM Mark)		X	X	X	X	X	X	X	X	X	X
TL9000 certified		X	X	X	X	X	X	X	X	X	X
ISO 14001 certified		X	X	X	X	X	X	X	X	X	X
ISO 9001:2008 certified		X	X	X	X	X	X	X	X	X	X

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Alcatel·Lucent

CRITICAL INFORMATION ACCESS FOR FIRST RESPONDERS

ENABLE BETTER DECISIONS IN THE FIELD WITH ASTRO 25 ADVANCED MESSAGING SOLUTION

Get more from your mission critical ASTRO® 25 system with ASTRO 25 Advanced Messaging Solution. Users can quickly send and receive messages and run database queries directly from their data-enabled Motorola two-way radios. With access to this information, first responders are able to make on-the-spot decisions, freeing air time for critical voice communications. When integrated with PremierOne™ CAD (Computer Aided Dispatch), your personnel can also automatically receive dispatch information, BOLOs and remotely update their status. The ASTRO 25 Advanced Messaging Solution helps you better serve your community with a faster, safer and better coordinated and informed workforce.

COMPREHENSIVE PLATFORM

Easily exchange information across your entire operation and with your external partners when you unify your communications and connect your devices, including mobile and portable radios, smart phones, PDAs, desktop clients and mobile data computers. ASTRO® 25 Advanced Messaging Solution is IP-based and connects to messaging systems such as Microsoft® Exchange Server using SMTP for comprehensive information delivery.

FLEXIBLE CONFIGURATIONS

You have options when determining the best solution to meet your operational needs. Designed to match the mission critical requirements of public safety, ASTRO 25 Advanced Messaging Solution is the flexible information exchange and data access platform that your workforce needs today. From dedicated messaging-only systems, high-availability options and configurations bundled with PremierOne™, you have the flexibility to install the features you need today, with the ability to expand to the capabilities you need in the future.

REAL-TIME INFORMATION ACCESS

With new levels of information at their fingertips, resources in the field can access the information they need when and where they need it. Information flows in real time across your operation, improving workflows, awareness and productivity.

CJIS COMPLIANT QUERIES

To meet your information assurance (IA) needs, we offer CJIS-compliant query options based on RSA multi-factor authentication technologies. With approved access to secure databases and protection of query results, users can quickly access the confidential information they need to make better on-the-spot decisions.

DESIGNED FOR FIELD USE

- Audible and visual alerts notify users when information arrives
- Content adapted for radio capability
- Intuitive and easy-to-use interface
- Up to 150 pre-definable messages for quick and easy responses
- Radio keypad makes it easy to compose free-form text messages of up to 200 characters
- Pre-defined address lists or user ID entry speeds message creation

IMPROVED COMMUNICATIONS

Users can exchange messages with dispatch, between individual portables and pre-defined groups for quick and focused information sharing. Using messaging reduces overall system talk time, freeing channels for critical voice communications.

Message delivery and system resources are optimized through store-and-forward functionality, sending messages only to active radios on the system, reducing network traffic. If a radio is off the system, its messages are stored for later delivery.

SMART CLIENT

The Microsoft Windows® based ASTRO 25 Advanced Messaging Solution Smart Client is an easy-to-use application that allows users to run queries against internal and external databases and exchange messages with radio users and others. In addition to giving you a view of logged on personnel and devices, the feature-rich smart client also organizes your contacts, message groups and message folders, in a convenient, streamlined and intuitive user interface.

PREMIERONE ADVANTAGE

Motorola PremierOne is a powerful suite of applications specifically designed for the public safety environment. When you deploy ASTRO 25 Advanced Messaging Solution with PremierOne CAD you get tight, total system integration. New avenues of communication, information access and exchange are opened. Users can receive dispatches and BOLOs, update their status, run license plates and other queries, and send messages easily from their radios.

You expand your real-time operational picture, enhancing your ability to make smart decisions and improve the safety of your responders and your community. While you will achieve the maximum functionality using a PremierOne system, your legacy CAD system supplier can implement an interface through our published API to gain a subset of data interaction with your ASTRO® 25 radios.

To learn more about how ASTRO 25 Advanced Messaging Solution can help you enhance the capabilities and safety of your emergency services personnel, contact your Motorola representative or visit **motorola.com/dispatch**.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. **motorolasolutions.com**

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MOTOROLA

FOCUSED ON THE MISSION, NOT THE TECHNOLOGY

MCC 7500 IP LOGGING RECORDER SOLUTION

Panicked citizens and inundated dispatchers. First responders frantically trying to assess a situation with fragmented and conflicting information. Emergencies are chaotic. To assess performance afterwards, to get even better for the future, you need a precise record of communications and an easy way to access exactly the files needed to recreate an event.

You get it all with the MCC 7500 IP Logging Recorder developed by Motorola and NICE® Systems, Inc. for the ASTRO® 25 network.

A SEAMLESS SOLUTION CERTIFIED TO BE RELIABLE

The MCC 7500 IP Logging Recorder is a seamless, dedicated solution for the Motorola MCC 7500 IP Dispatch Console. It is the only ASTRO 25 logging recorder solution that sits on the radio system's IP network, and it meets all of the extensive Motorola performance specifications required to be implemented on the network. Plus, you get the uncompromising reliability and quality that are unique to Motorola.

A COMPREHENSIVE RECORD OF EVERY CALL

You get far more than just an audio recording of a conversation. Through its NICE Inform Lite application you see all of the valuable data associated with each call: radio ID, alias, talk group, emergency alarms, supergroup dispatches, and changes to a talk group's tactical/normal selections.

FULLY DIGITAL, OPTIMAL AUDIO, AND SUPERIOR SECURITY

You can listen to recordings with the identical clarity heard by the person operating the console at the time the call came in. Audio is recorded and stored in its native vocoded format – the identical form that it passed through the radio system. This eliminates degradation and provides for optimal audio.

Integration with ASTRO 25 makes it possible to partition your archives. Multiple agencies can share a system to achieve interoperability, streamline storage and lower cost. Each department (police, fire, public works, etc.) has its own dedicated access to just the communication they need to playback.

You can achieve a high degree of security with the ASTRO 25 system and true end-to-end encryption by adding secure capability to the dispatch console and the archiving interface server.

Plus, with the MCC 7500 IP Logging Recorder you have the flexibility to provide centralized or distributed logging of conventional or trunked radio audio, its associated call information, and even some radio system events.

KEY FEATURES

Archiving Interface Server (AIS) – This is the interface that sits between your radio system and the MCC 7500 IP Logging Recorder. It makes it possible to record calls and the call related data. You need one AIS for each logging recorder. The AIS also:

- Monitors the resources you specify
- Passes call-control information to the logging recorder
- Redirects audio from monitored channels to the logging recorder

MCC 7500 IP Logging Recorder – This server stores all the call control information and vocoded audio packets associated with each call that it receives from the AIS. The system administrator specifies the talkgroups, conventional channels, etc. that are recorded so that the information can later be easily retrieved when it is needed.

Simultaneous Recording for up to 120 Calls – The MCC 7500 IP Logging Recorder has the same capacity as the AIS: it can handle up to 120 simultaneous calls including trunked talkgroups and conventional channels. Audio and data files are written to a DAT 72 drive for archiving.

Types of Calls Recorded Include:

- Announcement group calls
- Site-wide group calls
- Talk group calls
- Analog and digital conventional calls via a digital conventional channel gateway
- Emergency on trunking/digital conventional

Information captured for every call includes:

- Date and time stamp
- Type of call with ID and alias (if applicable)
- Unit ID of the device originating the call
- Unit ID alias of the device originating the call
- Site ID where the call originated
- Zone ID where the call originated
- Secure on non-secure call designation announcement group calls

Dispatcher-initiated events recorded include:

- Call alert
- Emergency alarm
- Emergency acknowledge & knockdown
- Repeat control
- Resource status
- Talk group priority status
- Main/Alternate status
- Frequency control

INFORM LITE RECONSTRUCTION APPLICATION

Your NICE Inform Lite application resides on a conventional PC to become the Replay Workstation. Here is where recorded audio is devocoded, converted to analog and played back.

The audio you hear has the identical sound quality as that heard originally at the MCC 7500 IP dispatch console. This is because NICE Inform Lite supports all the vocorders used in the system and uses the same error mitigation techniques.

You can save a call on the replay station as a complete call (with audio and any associated data) or as a simple .wav file. And user replay accounts can be configured by agency to further expand the partitioning functionality.

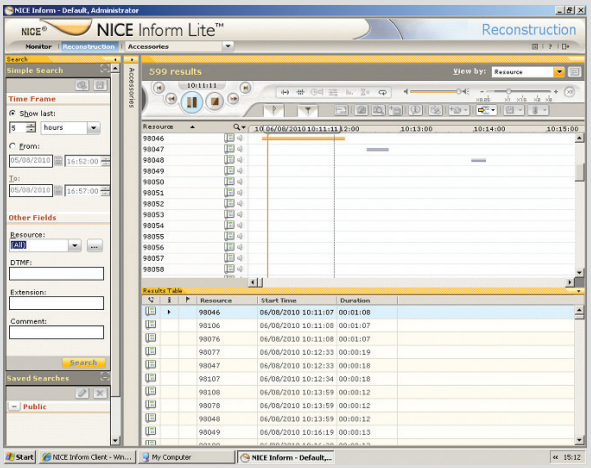
Audio and events which have been recorded by the logging recorder(s) are accessed via the browser based Inform Lite application. A state-of-the-art multiple channel search and replay tool, Inform Lite is the standard shipping solution for the MCC 7500 IP Logging Recorder providing the ability to seamlessly retrieve audio and associated call data from radio and telephony recorders. It provides enhanced flexibility for replay across different networks. Presented in a graphical time-line view, the search results can be broken down by individual channels, talk groups, or unit ID's. Filters are the key to this simple, yet powerful, call and data retrieval. Within each filter, multiple criteria including date and time ranges, single or multiple Radio ID's or Alias', Talk Groups, or even Multi-group (Patch/Multiselect) can be selected to refine searches. Once retrieved, replay controls enable play, pause, stop, skip, variation of replay speed, Automatic Gain Control, play markers to isolate a specific section, and a variety of other options can be used to analyze the calls and data. For a more detailed analysis or for evidential purposes, scenarios may be output to electronic files as either standard .wav files or as secure files. Centralized system and user administration makes managing the system simpler. It also includes system event tracking through a comprehensive audit feature. Inform Lite provides the ease of use and flexibility required in the field. With its intuitive GUI, powerful filtering capabilities, file output capabilities and centralized management, users get the information they need for analysis, investigation, and evidence both quickly and easily.

ADMINISTRATOR APPLICATION

The logging recorders and replay workstations are configured and managed by the NICE Administrator. This application resides on the replay workstation and enables you to configure all system resources including users, user replay security, loggers and CLS databases.

The system administrator can:

- Determine talk groups and conventional resources to be recorded
- Identify the secure and non-secure calls to be recorded
- Prioritize talkgroups and conventional resources to determine which calls to keep when capacity limits are exceeded
- Assign access rights for replay station user accounts



SPECIFICATIONS

The MCC 7500 IP Logging Recorder utilizes an Intel® Xeon® Processor server with two logical drives in a RAID 1 array configuration providing up to 75,000 on-line channel hours, dual DAT 72 archive drives, a DAT 160 archive drive, 6 hot plug redundant fans, redundant hot plug power supplies and Windows™ Server. It is scalable to add capacity with the purchase of additional call licenses. Two HP StorageWorks 1U Rack-Mount kit housings are used to house the DAT archiving drives.

MCC 7500 IP Logging Recorders:

- TT2598 10 Simultaneous Call Audio and Event Archiving Recorder
- TT2599 120 Simultaneous Call Audio and Event Archiving Recorder
- TT05712AA 10 Simultaneous Call Capacity Increase (Up To 120 Max)

MCC 7500 Redundant IP Logging Recorders:

- TT2600 Redundant 10 Simultaneous Call Audio and Event Archiving Recorder
- TT2601 Redundant 120 Simultaneous Call Audio and Event Archiving Recorder
- TT05713AA Redundant 10 Simultaneous Call Capacity Increase (Up To 120 Max)

MCC 7500 IP Logging Recorder Resiliency Features and Options:

Audio Archiving Devices: HP StorageWorks DAT 72 Tape Drive (x2)

NiceCLS™ Backup Devices: HP StorageWorks DAT 160 Tape Drive

Vocoder Algorithms Supported

Different vocoder formats are used: IMBE (4.8 kb/s) in ASTRO 25 systems 7.5 or earlier and AMBE+2 in 7.6 and later, ACELP (5.1 kb/s) in Dimetra® systems and G728 (16 kb/s) for conventional calls.

TECHNICAL SPECIFICATIONS*

	IP RECORDER HP® DL360 G8
Size (H x W x D)	1.7 x 17.1 x 27.5 in
Weight (Typical Configuration)	32 – 42.3 lb
Rated Line Voltage	100 TO 240 VAC
Rated Input Current	4.5 AMPS (@ 120 VAC)
Rated Input Frequency	50 TO 60 HZ
BTU Rating	1773 BTU/hr (@120 VAC)
Power Supply (per power supply)	Steady State Power: 460 W (@ 100 to 120 VAC) Max Peak Power: 460 W (@ 100 VAC)
Operating Conditions	Temperature Range: 50° to 95° F Relative Humidity: 10% to 90%

* Specifications are subject to change.

To learn more about MCC 7500 IP Logging Recorder, contact your Motorola representative or visit **motorola.com/dispatch**.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. **motorolasolutions.com**

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MOTOROLA

POP 25:
PROGRAMMING OVER PROJECT 25

STREAMLINE THEIR UPDATES. AND STRENGTHEN YOUR SAVINGS.

Your first responders are in the field—battling fires, responding to emergencies, and protecting lives. Updating their radios with a new code plug configuration or making a modification to an existing one can be time-consuming and labor-intensive. In fact, locating and reprogramming radios takes them away from their mission and can cost your agency thousands of unproductive man-hours.

We listened to these concerns and developed the first Programming Over Project 25 (POP25). POP25 streamlines the process so Motorola ASTRO®25 two-way radios can be accessed and updated over-the-air using digital ASTRO 25 Integrated Voice and Data (IV&D) conventional and trunked systems. Now your responders can enjoy all the advantages of ASTRO 25 without lost time or logistical challenges.

KEY FEATURES

Update easily, wirelessly
Update anytime, anywhere within the radio coverage area via the ASTRO 25 IV&D network. Once a configuration update is downloaded to the radio, your users can install new changes immediately or delay changes to be installed on the radios as they are being powered up. Radios can also be configured to let users accept or reject an update.

Gain total configuration control
Get access to all configuration parameters programmable through the Customer Programming Software (CPS) to perform updates over-the-air.

Specify the exact changes
Update only the new changes needed and save time by not requiring a full code plug re-write, just a partial one.*

Download without losing communication
Retain full use of the radio during the configuration data transfer without interrupting communication.

- Voice always takes priority over POP25 data transfers
- When a voice call ends, POP25 starts where it paused programming; there's no need to restart
- Users do not have to switch to a non-busy or conventional channel
- User do not have to stay in an area with high signal strength during the download
- All radio functions and capabilities are accessible and enabled during download

Schedule in advance automatically
Use the POP25 Scheduler to queue up to 16 radios for updates over-the-air using templates. The system will automatically generate a report showing which radios were successfully programmed.

Update simultaneously
Update a number of radio users at the same time through multiple programming stations.

Fix programming mistakes without added costs
Programming errors can cost agencies hundreds of lost man-hours. By using POP25, mistakes can be rectified over the air quickly, without any impact to users.

Be confident radios are secure
POP25 requires an Advanced System Key (ASK) to prevent unauthorized programming of radios over the ASTRO 25 trunking systems. POP25 can also work with the Encrypted Integrated Data (EID) feature for ASTRO 25 trunking systems that require data confidentiality. POP25 requires AES encryption when used with ASTRO 25 conventional systems for secure over-the-air programming.

Save time and training
POP25 uses the familiar CPS interface, and is engineered to be very easy to use for technicians and users alike; minimal training is required.

Be assured of system support
POP25 is currently supported on the XTS/XTL and APX platforms for both ASTRO 25 conventional and trunked systems. POP25 is supported on XTS/XTL 1500 for trunked operation only.

* Available on XTS and XTL radios only.

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R3-26-2005B

MOTOROLA

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ASTRO®25 Text Messaging Service

Provide text information quickly and easily to your ASTRO 25 mobile and portable radios to make better decisions for better outcomes.

Intelligence on the Front Lines

On the scene, on the streets, where the action is, your field personnel need information to make decisions. Obtain and share data, maintain situational awareness, conduct investigations, anticipate events, reduce administrative overhead, minimize response times and work with maximum impact with the aid of text messaging.

The ASTRO 25 Text Messaging Service (TMS) provides public safety personnel with real-time secure remote access to mission critical information. Silent and reliable, text messaging is an ideal form of alternative communication when sensitive information is being shared or when the environment is too noisy for conversation. Text requires fewer system resources, making it a good option when major incidents generate high volume radio traffic. Text also conveys detailed information in a convenient form that allows recipients to refer back without having to write down or record the message for later reference.

Available on ASTRO 25 voice and data systems, this service provides additional capabilities for both mobile and portable users. It provides the ability to:

- Send and receive text messages with other radio users and dispatch operators.
- Broadcast text messages to a group of radio users.
- Select from a list of pre-defined messages to quickly compose or respond to messages.
- Store incoming, draft and sent messages for later reference.
- Query databases for critical information such as license plate look-ups.

Radio user text messaging services

Free-form text messages – compose text messages up to 200 characters using the radio keypad.

Pre-defined messages – choose from 150 pre-defined messages in the radio for quick and easy responses.

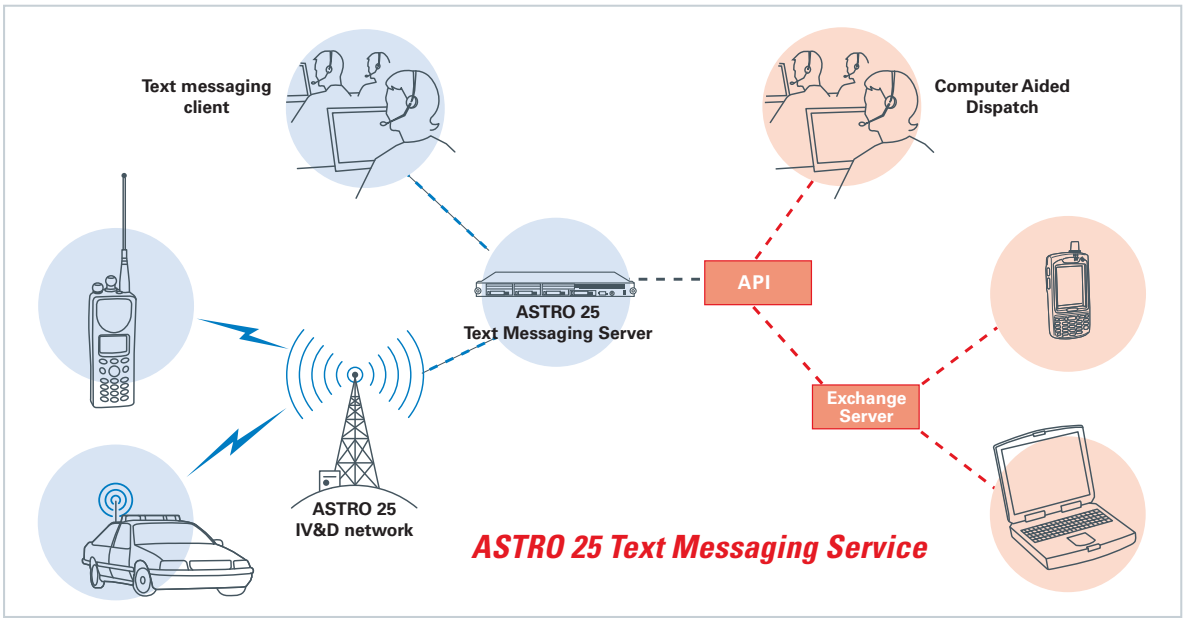
Store messages – radios are equipped with an inbox folder to store up to 30 incoming messages, a drafts folder to store up to 10 edited quick text messages or free-form messages, and a sent folder to store up to 10 transmitted messages.

Audio and visual alerts – receive an alert with the arrival of a message without having to look at the radio.

Quick access – use the pre-programmable button or the data button on the radio to quickly access the text messaging application.

Address book – access addresses through pre-defined address list or by entering a user ID. Radio users can send the message to the dispatcher or to a single user or group of users.

Text messaging service is available for public safety users with the XTS® and XTL™2500/5000 and APX™ family of radios.



Text messaging server

The text messaging server controls the distribution of text messages in the system. Once set up, the server requires no operational actions by the user.

Store and forward – optimizes the delivery of messages by tracking the status of radios. Message delivery and retry is attempted only when the radio is present. Messages directed to radios that are off the system are stored in the server and delivered as soon as the radio or user becomes available.

Text group – allows a message to be sent to multiple radios and or dispatchers enabling fast notification in the case of high alert events.

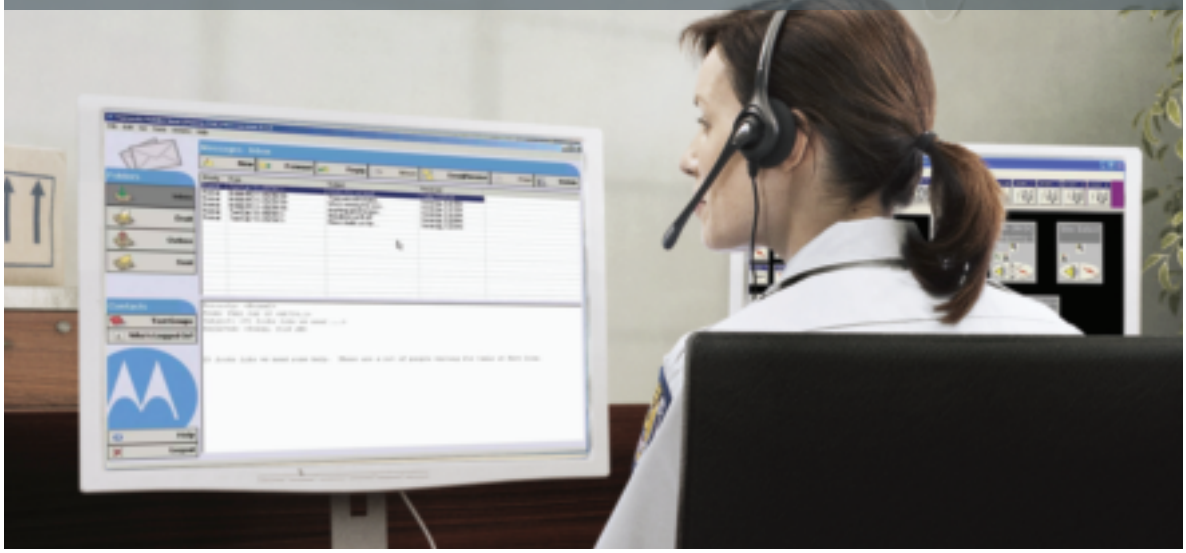
Message logging – messages are stamped with date and time information and logged to a database which can be retrieved as needed.

Text messaging API

The ASTRO 25 text messaging application programming interface (API) is an optional feature available with the text messaging server. The API allows third-party developers using a standards based IP protocol to integrate a rich set of public safety and enterprise applications and services, such as database query, emergency alert, Be On the Look Out (BOLO) alerts, and incident dispatch.

In addition, the API provides a digital IP-based unified messaging service between radios, wireless mobile data terminals, dispatch consoles, PDA clients, and mobile phones using the customer's current exchange servers plus the ASTRO 25 text messaging API.

Messaging client can reside on either the CENTRACOM® Elite or MCC 7500 work station to minimize hardware.



MOTOA4™

MOTOA4 Mission Critical Portfolio

The ASTRO 25 network is part of the MOTOA4 mission critical portfolio offering seamless connectivity between first responders. Motorola puts real-time information in the hands of public safety and government personnel to provide better information that enables better decisions for better outcomes. It's Technology That's Second Nature™.

For more information on the ASTRO 25 text messaging service or the entire MOTOA4 mission critical portfolio, please visit our website or contact your Motorola representative.

motorola.com/ASTRO25

MOTOROLA

Motorola, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. www.motorola.com/ASTRO25 1-800-367-2346

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RC-26-2013

PARTICIPATE IN CRITICAL COMMUNICATIONS FROM YOUR DESKTOP PC

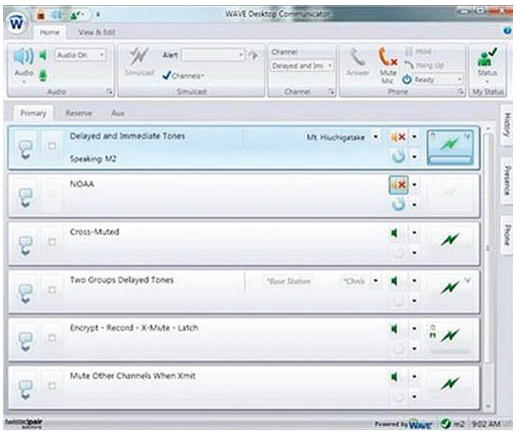
WAVE™ DESKTOP COMMUNICATOR

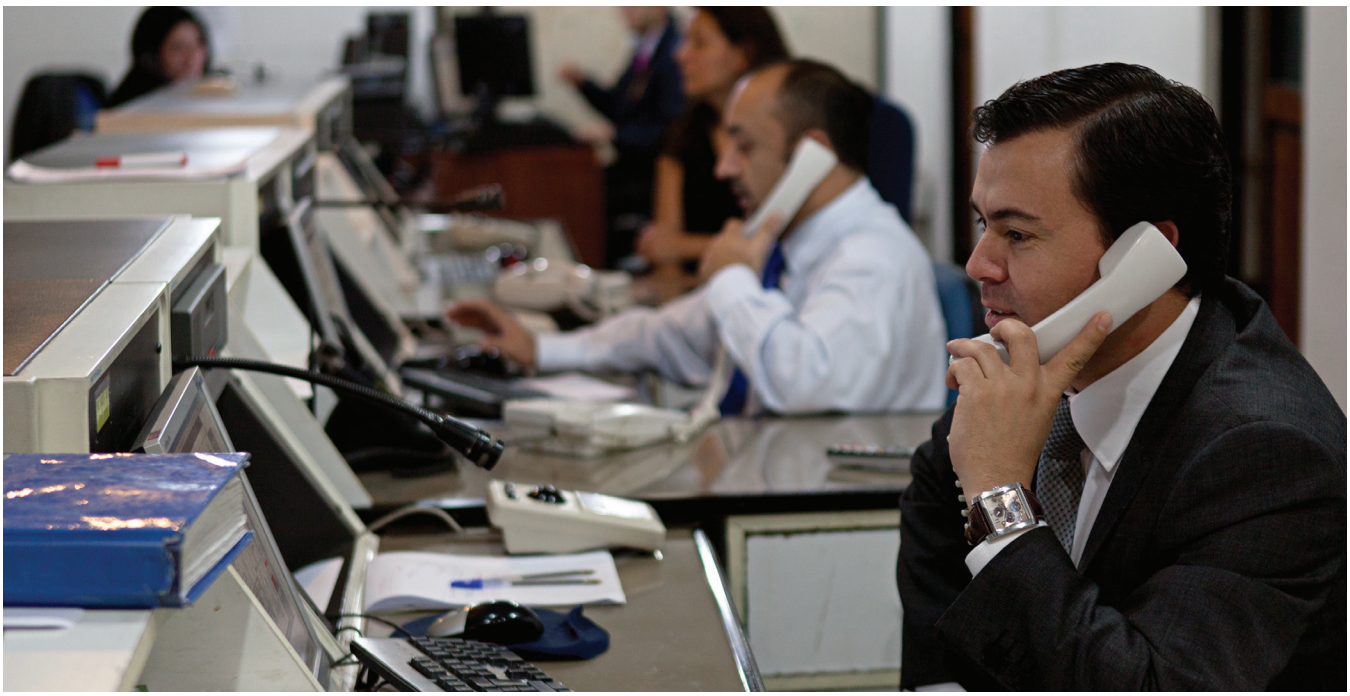
The WAVE Desktop Communicator is Motorola's most widely deployed critical communications application, with thousands of clients in daily use around the world supporting military, federal government and commercial organizations.

Desktop Communicator is a feature-rich software application that allows office-based or mobile workers to use their desktop or laptop PC to monitor, transmit, and receive audio from multiple communication systems such as two-way radio networks and telephones. With an intuitive and easy to use display that uses the latest Microsoft Ribbon Control technology, Desktop Communicator runs on virtually any PC from multi-processor desktop machines to Netbooks.

POWERFUL AND PORTABLE

Desktop Communicator can manage more than 100 channels of secure, encrypted audio on a standard laptop computer, and because it utilizes the machine's CPU for all of its audio processing, no additional specialized or proprietary hardware is required. This minimal hardware requirement also means that Desktop Communicator can go anywhere. Simply connect the PC to a network (wired or wireless) and the user can monitor and fully participate in critical communications. The application runs in the background enabling users to manage other tasks while still monitoring audio from multiple channels. Status bar pop-ups help by providing a visual indication of activity.





INTUITIVE AND FLEXIBLE

Desktop Communicator can be run in a variety of user defined modes. Fly out panels that offer Presence, History and Softphone interfaces can be exposed when needed and hidden when not required. In addition each of the panels can be detached and pinned anywhere on the user's screen. The entire Ribbon Control can me hidden to maximize the amount of screen used for channel activity and the entire channel area can be managed with a zoom control to make channels as large or small as desired.

INTELLIGENT, CUSTOMIZABLE DESIGN

Intended for users who do not have dispatch responsibilities, a Desktop Communicator client runs as a standalone Windows program. Each time a user logs off the system, preferences are saved by the controlling WAVE Management Server so that at the time of the next login Desktop Communicator will open the same way as it was closed – regardless of the machine being used. Desktop Communicator is designed to be easily localized into any language.

WAVE DESKTOP COMMUNICATOR KEY BENEFITS

TESTED AND TRUSTED

WAVE Desktop Communicator is the industry's most widely deployed and battle-test IP Dispatch console.

FLEXIBLE AND SCALABLE

Operators can deploy, redeploy and provision instantaneous back-up services using WAVE Desktop Communicators running on off-the-shelf PCs without the added cost of filling a back room with servers and networking gear.

EFFICIENT AND PRODUCTIVE

Individual users can display and manage an unlimited number of channels that make up a customizable, complex and fluid communications environment.

FULL AUDIO HISTORY

Activity displays, audio recording and instant replay give operators a complete session history for archiving and audit trail purposes.

ENHANCED COLLABORATION

Text messaging and intercom between multiple WAVE Desktop Communicator consoles and other WAVE-enabled applications improves situational awareness and dispatcher effectiveness.

PUSH-TO-TALK (PTT)

- Transmit (PTT) on group, individual and emergency calls
- Instant Transmit
- Left-right audio panning on stereo output devices
- Selection of audio devices to be associated with individual channels
- Selection of an audio device to be associated with all channels
- Audio routing between headset and speaker
- Broadcast – Simultaneous transmit across multiple channels
- Pre-defined alert tones and recordings
- PTT ID/alias
- Instant Replay, allowing play back of audio on a channel
- Option to save Instant Replay to disk
- Channel latch
- Radio-specific hot keys for WAVE channels that map to radio systems
- Selection of separate microphone and speaker devices on a channel-by-channel basis or across all channels

TELEPHONY

- Supports H.323 and SIP
- 8 simultaneous phone lines per position
- Answer/release
- Transfer
- Conference
- Hold/Mute
- Last number dialed

SYSTEM

- Status and presence of all endpoints per channel and system-wide
- System tray "pop ups" provide a visual indicator of channel communications
- Group text messaging
- Per-channel call history
- System-wide call history
- Actionable history – see a missed transmission and click for instant replay
- An activity record, which graphically depicts activity on a channel for a user-defined period
- Console-to-console intercom
- Master-console volume adjustment
- Mute All
- Channel recording
- Status messages
- Aux I/O controls
- Network Health Monitor
- Selection of network interface to use for transmission – ideal for users who have multi-homed machines or who are accessing the corporate network via VPN or dialup connections
- Ability to use "free-seating". This allows users to logon to WAVE from any computer and have their settings and preferences automatically downloaded for them.
- Organize channels by tabs
- Receive audio from all channels using only 1 IP stream on the network
- Network Troubleshooting indicator and connection wizard
- Microsoft Ribbon Control technology
- Zoom control – adjust channel size as needed
- Bing maps
- Sat location
- Section 508 compliant

MINIMUM SYSTEM REQUIREMENTS

Device:	PC (Desktop/Laptop)	Operating System:	Windows 7
Hardware:	1.6 GHz x-86 processor 1.0 GB RAM, 100 MB HD 3D Accelerated GPU DirectX 9.0 with 64 MB RAM	Network:	LAN/WAN/WiFi

DATA SHEET
WAVE WORK GROUP COMMUNICATIONS:
DESKTOP COMMUNICATOR

WAVE DESKTOP COMMUNICATOR IS AVAILABLE WITH WAVE 5000

WAVE 5000 Is Highly-scalable, Feature-rich, Enterprise-grade PTT for Broadband Networks and Devices

Many thousands of public safety organizations rely on their Motorola ASTRO® 25, Dimetra TETRA and other two-way radio technologies for mission-critical PTT communications. WAVE 5000 enables full interoperability between different radio systems and extends the reach of these systems, using any combination of broadband networks and devices:

Network:	Public or Private 3/4G LTE data network, WiFi, enterprise LAN/WAN
Devices:	Android, Apple, BlackBerry smart devices, custom handhelds like the LEX L10, PCs, desktop phones
WAVE PTT Applications:	WAVE Mobile Communicator WAVE Dispatch Communicator WAVE Desktop Communicator WAVE Web Communicator WAVE Communicator for Microsoft Lync WAVE Communicator for Microsoft SharePoint
Radio Integration(s):	Motorola ASTRO 25 with ISSI wireline interface Motorola ASTRO 25 and TETRA with MOTOBRIDGE wireless interface Motorola MOTOTRBO™ with wireline interface Other vendor Project 25 (P25) and non-P25 systems with MOTOBRIDGE wireless interface
Capacity:	Up to 3,000 end-points

To learn more about WAVE 5000 and WAVE Desktop Communicator,
contact your Motorola representative or visit **motorolasolutions.com/WAVE**.

Motorola Solutions, Inc. 1301 East Algonquin Road Schaumburg, Illinois 60196, U.S.A. 800-367-2346 **motorolasolutions.com**

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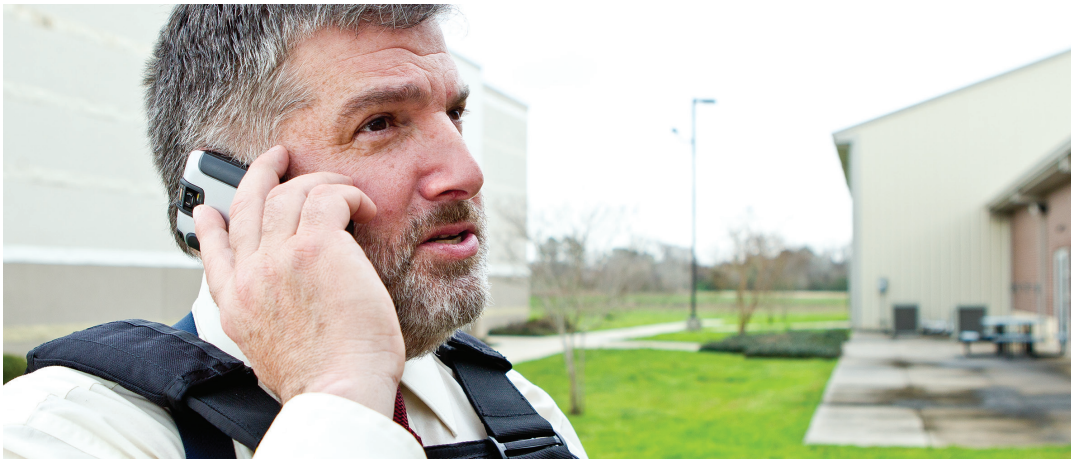


BROADBAND PUSH-TO-TALK ANYWHERE

WAVE™ MOBILE COMMUNICATOR

The WAVE Mobile Communicator extends push-to-talk communications by enabling smartphones and other specialty devices to securely communicate with any other communication systems over broadband networks.

INSTANT, SECURE PUSH-TO-TALK

The WAVE Mobile Communicator turns smart device into a multi-channel push-to-talk handset. It enables instant, secure and inexpensive communication with other individuals and teams whose primary communications device may be a land mobile radios (LMR), a custom handheld computing device, a PC or another smartphone/tablet.

MOST DEVICES, ANY CARRIER

It's likely that you already own or have access to a device capable of running the WAVE Mobile Communicator. Whether it's an Apple or Android, smartphone or tablet - we've got you covered. You can use a public or private mobile data network or Wi-Fi for connectivity, giving you the freedom to keep the service plan you have or to select another that fits your needs.

EXTEND YOUR LMR NETWORK

The WAVE Mobile Communicator lets you extend workforce communications beyond LMR, ensuring seamless communications in any location with data network access. Better still, you can extend any vendor's LMR system without being confined to a proprietary, single vendor solution that limits choice and drives up costs.

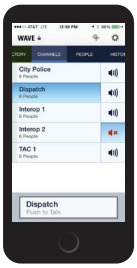
ENGINEERED FOR CRITICAL COMMUNICATIONS

Built on technology engineered for and deployed by our government and military customers, the WAVE Mobile Communicator delivers industry-leading audio quality, unrivalled per-channel user capacity, always-on service with no connection setup times and LMR-equivalent latency. Integrated mapping, group and private call capability, multiple channel monitoring, presence and channel history combine to deliver the most compelling broadband push-to-talk solution available today.

UNIQUE, PROVEN AND TRUSTED

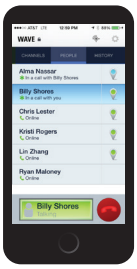
The WAVE Mobile Communicator is in widespread use today with military, government and commercial organizations that require a high-performance, robust and geographically unrestricted push-to-talk capability using off-the-shelf devices connected to broadband networks, public or private.

DATA SHEET
WAVE WORK GROUP COMMUNICATIONS:
MOBILE COMMUNICATOR



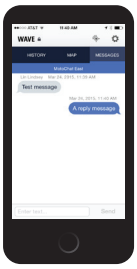
INTUITIVE, USER FRIENDLY DISPLAY

A high contrast and clutter-free multi-tab display makes PTT simple and gives users easy access to the application's rich functionality. PTT on the user selectable primary channel is available from any tab.



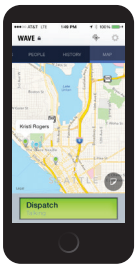
GROUP CALL OR PRIVATE CALL

Two modes of operation are available to all users. Use Group Call to talk with everyone on the channel, or select Private Call for a secure, one-to-one conversation with any other member of a channel.



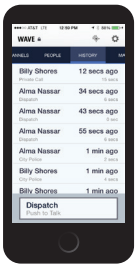
GROUP TEXT MESSAGING

When audio push-to-talk communications are not practical or desired, such as in high noise environments or when covert communications are required, users can participate in group text messaging on any channel or talkgroup with other WAVE mobile users and with users of the WAVE Advanced Desktop and Desktop Communicators.



MAPPING SHOWS USER LOCATION

GPS data is used with a mapping feature to show where all users are located and their current status. Updated every 30 seconds, this capability allows accurate resource identification and real-time management of teams.



USERS AND HISTORY

Identify which of your team members or individuals are logged in to your channels and see if their location is being displayed. A record of channel activity is also presented.

WAVE MOBILE COMMUNICATOR IS AVAILABLE WITH WAVE 5000 AND WAVE 3000

Because every operational environment is unique, we offer WAVE solutions that deliver the capabilities and performance required to match your network size, sophistication and IT/engineering resources.

WAVE 5000

Developed as a highly scalable, feature rich, enterprise grade PTT solution, WAVE 5000 enables full interoperability between different radio systems and extends the reach of these systems using any combination of broadband networks and devices.

Radio Integration(s):	Motorola ASTRO 25 with ISSI wireline interface
	Motorola ASTRO 25 and TETRA with MOTOBRIDGE wireless interface
	Motorola MOTOTRBO with wireline interface
	Other vendor P25 and non-P25 systems with MOTOBRIDGE wireless interface

WAVE 5000 supports up to 3,000 users.

WAVE 3000

Optimized for Motorola MOTOTRBO systems with a wireline interface, WAVE 3000 offers radio extension to smartphones and tablets using a simple appliance server for ease of deployment, management and support. WAVE 3000 can support up to 500 users.

Radio Integration:	Motorola MOTOTRBO with wireline interface

MINIMUM SYSTEM REQUIREMENTS

Network:	3/4G public LTE & WiFi
Device:	Android Apple
Operating System:	iOS 7.1 and higher Android 4.1 and higher

Download on the App Store

GET IT ON Google play

To learn more about WAVE Mobile Communicator, contact your Motorola representative or visit **motorolasolutions.com/WAVE**.

Motorola Solutions, Inc. 1301 East Algonquin Road Schaumburg, Illinois 60196, U.S.A. 800-367-2346 **motorolasolutions.com**

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MOTOROLA

601 Data Drive
Plano, TX 75075

Contract #:
Customer: Motorola - Marin County
Project: Marin County RFP
Proposal #: 16us624234.05
Date: November 8, 2016
Prepared by: Sung Tran
Phone: (972) 477-4400
Email: Sung.Tran@nokia.com

	Part Number	Description	Dollar Hill	Marshall	Mt Barnabe	OTA Broadcasting	Mt. Tamalpais	Muir Beach	Prime Site	Pt. Reyes	San Pedro	Stewart Pt.	Tomales	Water Tank	Wolfback Ridge
		9500 MPR Microwave Switching Shelf (MSS)													
1.01	3EM22715AG	MSS-8 Shelf w/Fan Alarm Evo - HSv2	1	1	1	1	1	1	1	1	1	1	1	1	1
1.02	3EM24105AA	Fan Alarm Cable - 25 foot	1	1	1	1	1	1	1	1	1	1	1	1	1
1.03	3DB19017AB	Ethernet Access Module (v2) w/8 GbE port	2	2	2	2	2	2	2	2	2	2	2	2	2
1.04	3DB18126AE	32xT1 TDM Module			2						2			2	
1.05	3DB18788AC	CorEvo-10G	2	2	2	2	2	2	2	2	2	2	2	2	2
1.06	3DB18634AB	MPT Access module with PoE (2 port)					2							2	2
1.07	3CC50174AA	MPT Extended Power Unit	1	2	2	2	2	2	1	2	2	2	2		2
1.08	3DB16102AA	32 E1/T1 Protection Panel - D-Connector			1		1				1			1	
1.09	3DB16109AA	D-Connector Rack Mount Bracket			1		1				1			1	
1.10	3CC52118AA	E1/T1 SCSI-SCSI Interface Cable (16 T1/E1 per Cable)			2		2				2			2	
1.11	3EM23110AB	8 DS1 Cable Assembly (D-Open) 30ft			1		1				1			1	
1.13	3DB23386ABAB	9500 MPR R6.1 uSD Card for CorEvo-10G (ICS02)	2	2	2	2	2	2	2	2	2	2	2	2	2
1.14	3EM23067AAAA	9500 MPR CT License (Per PC Installed)													
1.15	3DB18970BJBB	9500 MPR R6.1 SW Electronic Kit ICS02	1	1	1	1	1	1	1	1	1	1	1	1	1
1.16	3DB19275ABAA	9500 MPR R6.1 Customer Documentation Electronic Library													
		9500 MPR Microwave Packet Transceiver (MPT)													
1.17	3DB20760DA	MPT-XP-HQAM L6GHz low				1							1		
1.18	3DB20753BD	MPT-HC 5929.96-6050/6182-6302.04MHz,Ext Diplex(BRANCH CH1-1P P.SH.252.04MHz)				1							1		
1.19	3DB20761DA	MPT-XP-HQAM L6GHz high											1		
		9500 MPR RTUs - per ODU/RF Transceiver/ Upgrade													
1.22	3MU00086AAAA	9500 MPR MSP Ring RTU	1	2	2	2	3	2	2	2		2	2	2	2
1.23	3EM23068ADAA	RTU 160Mbps TRX Capacity	1	2	2	2	3	2	2	2	2	2	2	2	2
		9500 MPR Microwave Packet Transceiver Accessories													
1.25	3CC50251AA	Ground kit – (qty 3 per run under 100', add 1 each 100' more)												6	
1.26	3CC58226AB	coupler 10 dB 10-11.7 GHz flat GR3108					1				1				

1.30	3MU00085AC	3 ft RJ45 Cat5e Cable	4	4	4	4	12	4	4	4	4	4	4	2	4
1.33	1AB328430001	Lightning arrestor for Cat5e cable												2	
1.34	1AD173640001	BRL Cushion BC141X 1-5/8in,10@0.24in,10p												4	
1.35	916626	HANGER, STACKABLE 1-5/8 10 KIT												4	
1.36	3DH04122HA	Flange Adapter CPR-137 1PORT, 6Ghz				1							1		
1.37	3DH04122HN	Flange Adapter CPR-90 1PORT, 11Ghz	2	2	2	1	5	2	2	2	1	2	1	2	
1.38	695-7834-008	Waveguide Kit 11 GHz Cable & Transition, SMA-CPR				1							1		
1.39	1AC016760006	Cat5e cable - GLP is per foot												140	
1.40	1AB074610027	RJ-45 connector for indoor and outdoor ends of cat5e												8	
1.41	1AB150990002	R2CT connector protection for RJ45 outdoor												2	
1.43	3DB10137AB	Non-Integrated Pole Mount (GR-3108)	2	2	2	2	5	2	2	2	1	2	2		2
1.44	3DB01460AB	MPT-HC 6 GHz Nose Adapter Non Integrated Antenna				1							1		
1.45	3CC50125AA	11GHz nose WR90 (flange UBR100)	2	2	2	1	5	2	2	2	1	2	1		2
1.46	3CC52191AA	Light Service alignment kit with LEMO connector													4
		Racks and Accessories													
1.47	3EM13317AB	Power Distribution Panel w/Fuse Alarm	1	1	1	1	1	1	1	1	1	1	1	1	1
1.48	3EM24705AA	Universal ODU Rack Mount Kit (11/18/23/38 GHz)	1	2	2	2	5	2	2	2	1	2	2	2	2
1.50	1553333001	Telect Chassis			1		1				1			1	
1.51	1553333003	Telect DSX-1 Module			1		1				1			1	
1.52	1AD144370001	Standoff Bracket 5.25 inch			1		1				1			1	
		ODU Hardware													
1.53	3DB20991BD	Diplexer 11 GHz Low	1	1	1	1	3	1	2	1	1	1	1	2	1
1.54	3DB20991BE	Diplexer 11 GHz High		1	1			1		1	1	1			1
1.56	3DB22000DA	MPT-HQAM 11 GHz LOW	1						2					1	
1.58	3DB22002DA	MPT-XP-HQAM 11 GHz LOW		1	1	1	3	1		1	1	1	1	1	1
1.59	3DB22003DA	MPT-XP-HQAM 11 GHz HIGH		1	1			1		1	1	1			1
		Manuals and Documentation													
1.60	3EM24226AA	Microwave Factory Test Certificate	1	1	1	1	1	1	1	1	1	1	1	1	1
3.00		**TSM-8000 Network Management System**													
3.01	3EM16790BA	Server License, 24 NE Ltd, SNMP													
3.02	3EM16790BV	Single Client as Server Wkstn Kit, Win , 110 VAC													
3.03	3EM18968DU	Model 2314,SNMP Alarm Encoder													
3.04	3EM16790BR	Client Log-in License													
3.05	3EM16790BS	SNMP Upstream Reporting													
17.00		**DC Power**													
17.01	1AF09631AHAA	uSageon, 25A, 125AH, 19in RR, 10 Year Front Access					1								
17.02	1AF19622ABAA	uSageon, 25A, 70AH, 19in RR, 10 Year Front Access	1	1	1	1		1	1	1	1	1	1	1	1

Part Number	Description	Big Rock	Dollar Hill	Marshall	Mt Barnabe	OTA Broadcasting	Mt. Tamalpais	Muir Beach	Prime Site	Pt. Reyes	San Pedro	Stewart Pt.	Tomales	Water Tank	Wolfback Ridge
	Antenna/Waveguide														
37500082	PAD8-59AC7S1R - 8' Stnd, CPR137G, Single Pol Ant., Includes Radome (molded), 2 struts					1							1		
10039985	SC3-W100AC - 3ft Hi Perf, CPR90G, Single Pol Ant., Includes Radome, NO struts	2	2	2	2	1	4	2	2	2	1	2	1	2	2
1AF28451AAAA	Tieback Steel - Bulk Angle 4" X 4" X ¼" x 20' (ANG414)	0	0	0	0	1	0	0	0	0	0	0	1	0	0
810265-001	**Standard Elliptical Waveguide, E60 (5.6 - 6.425 GHz)**					**85**							**130**		
399269-101	Connector, Tunable / CPR137G (bottom) (C137-060TG)	0	0	0	0	1	0	0	0	0	0	0	1	0	0
399269-103	Connector, Non-Tunable / CPR137G (top) (C137-060FG)	0	0	0	0	1	0	0	0	0	0	0	1	0	0
916534-158	Hoisting Grip (HOIST1-158L) - Lace-up (LCF158,HCA158,E60,EP60,EP65)	0	0	0	0	1	0	0	0	0	0	0	1	0	0
921234-061	Grounding Kit - 60" wire, E60 (GKIT-60-060)	0	0	0	0	3	0	0	0	0	0	0	3	0	0
920981-003	Hanger Kit for E60 (CLAMP-060) (10 pack, bolt-on)	0	0	0	0	3	0	0	0	0	0	0	5	0	0
915255	Angle Member Adapter Kit, 3/8" Stainless Steel (ANGLE-CLPI) (10 pack)					1							1		
CEIL12-5I	Ceiling Adapter Kit, 12" (CEIL12-5I, 514608-003) (5 pack) - waveguide only	0	0	0	0	1	0	0	0	0	0	0	1	0	0
915006-W	Hardware Kit, HDWK3/8-16X1, 3/8" – 16 x 1" bolt (915006) - 10 each lock washers, hex nuts & fillister head screws	0	0	0	0	3	0	0	0	0	0	0	5	0	0
400108	Pressure Window (WPW-137EP) - mates to CPR137G	0	0	0	0	1	0	0	0	0	0	0	1	0	0
400014	2' Twistflex (TF137-CC1-024I) - CPR137G/CPR137G	0	0	0	0	1	0	0	0	0	0	0	1	0	0
915663	4" Boot with 1 Hole for E60 (BOOT4-060)	0	0	0	0	1	0	0	0	0	0	0	1	0	0
815487-001	**Standard Elliptical Waveguide E105 (10.0 - 11.7 GHz)**	**172**	**140**	**211**	**200**	**80**	**315**	**350**	**110**	**82**	**105**	**210**	**125**	**140**	**344**
399503-101	Connector, Tunable (C90-105TG)	2	2	2	2	1	4	2	2	2	1	2	1	2	2
399503-103	Connector, Non-Tunable (top) (C90-105FG)	2	2	2	2	1	4	2	2	2	1	2	1	2	2
916533-108	Hoisting Grip (HOIST1-105L) - Lace-up (E105,E78)	2	2	2	2	1	4	2	2	2	1	2	1	2	2
921234-108	Grounding Kit - 60in wire, E105 (GKIT-60-105)	6	6	6	6	3	12	6	6	6	3	6	3	6	6
920981-007	Hanger Kit for E105, 7/8in coax (CLAMP-105) (10 pack, bolt-on)	6	5	8	7	3	11	12	4	3	4	7	5	5	12
915255	Angle Member Adapter Kit, 3/8in Stainless Steel (ANGLE-CLPI) (10 pack)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CEIL12-5I	Ceiling Adapter Kit, 12in (CEIL12-5I, 514608-003) (5 pack) - waveguide only	2	2	2	2	1	4	2	2	2	1	2	1	2	2
915006-W	Hardware Kit, HDWK3/8-16X1, 3/8" – 16 x 1" bolt (915006) - 10 each lock washers, hex nuts & fillister head screws	6	5	8	7	3	11	12	4	3	4	7	5	5	12
400130	Pressure Window (WPW-090EP) - mates to CPR90G	2	2	2	2	1	4	2	2	2	1	2	1	2	2
400124	2ft Twistflex (TF090-CC1-024I) - CPR90G/CPR90G	2	2	2	2	1	4	2	2	2	1	2	1	2	2
915665	4in Boot with 1 Hole for E105 (BOOT4-105)	2	2	2	2	1	4	2	2	2	1	2	1	2	2
1AF22298AAAA	4 1/2" Universal Ring Mount (Valmont: 801068, LWRM) - PREFERRED - 2 required for 4' or larger antennas									2					
409082278	Univ Round Member Support Brkt (Valmont: MS6) (for monopole) (one every 3') (has 6 mounting locations)									3					
1AF07352AFAA	1/2" Wraplock Stainless Steel Banding Kit (for monopole) - 100' (Valmont: WRL100) Kit includes 100 fastener buckles									1					
1AF07352AGAA	1/2" Stainless Steel Banding Buckles (for monopole) (Valmont: BU254) - per 25									4					
10042194	**APD20-D-35XH0R00S1 120v, 3-5psi, Lo psi alm, 10 day purge, < 7800' 6-12GHz**	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20040835	**Dehydrator Wall Shelf for APD20 (20040835)**	1	1	1	1	1	1	1	1	1	1	1	1	1	1
920204-**W**	Gas Distribution Manifold, 4 Port, 0-15PSIG (920204)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
409081635	UNIV ADJ LEG MT- UP TO 10 3/4 LEG (Ant. Pipe Mount)	2	2	2	2	2	4	2	2	2	1	2	2	2	2

ASTRO25 A7.16 Publicly Available Software / Open Source Software Inventory

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Customer Documentation Media Utilities						
GCD	A7.16	Office/Document Processing	Adobe Reader	http://www.adobe.com	11.x	Custom - Adobe Distribution License + End User License
GCD	A7.16	Office/Document Processing	Adobe Flash Player	http://www.adobe.com	14.x	Custom - Adobe Distribution License + End User License
Common Red Hat Linux Platform (RHEL5.x)						
Common_RHEL5_Platform	A7.16	Operating Systems - Desktop/Server	Red Hat Enterprise Linux	http://www.redhat.com	5.11	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common_RHEL5_Platform	A7.16	Security - Applications/Services	doinkd	http://sourceforge.net/projects/idled	0.01-3mot	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common_RHEL5_Platform	A7.16	Logging Services	syslog-ng	http://www.balabit.com/downloads/files/syslog-ng/sources/	2.1.4-1	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common_RHEL5_Platform	A7.16	Security - Applications/Services	Linux-PAM	http://www.kernel.org/pub/linux/libs/pam/	0.99.6.2-4mot	GNU General Public License Version 2.0 or Later (GPL-2.0+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_RHEL5_Platform	A7.16	Security - Applications/Services	Bastille	http://bastille-linux.sourceforge.net/	3.0.9-1.2mot	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common_RHEL5_Platform	A7.16	Security - Applications/Services	Samhain	http://www.la-samhna.de	2.4.2-1mot	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common Red Hat Linux Platform (RHEL6.x)						
Common_RHEL6_Platform	A7.16	Operating Systems - Desktop/Server	Red Hat Enterprise Linux	http://www.redhat.com	RH6.6	Commercial License + OSS Licenses
Common_RHEL6_Platform	A7.16	Security - Applications/Services	Samhain	http://www.la-samhna.de	3.0.2a	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common Red Hat Linux Platform (RHEL6.x) - Optional						
Common_RHEL6_Platform_Optional	A7.16	Middleware - Application Library	Oracle Java7 JRE	http://www.oracle.com	1.7.0_79	Commercial + OSS Licenses
Common_RHEL6_Platform_Optional	A7.16	Middleware - Application Library	Oracle Java8 JRE	http://www.oracle.com	1.8.0_45	Commercial + OSS Licenses
Common_RHEL6_Platform_Optional	A7.16	Middleware - Application Library	TAO	http://www.dre.vanderbilt.edu/~schmidt/ACE.html	2.0.2	Custom Attribution License
Common_RHEL6_Platform_Optional	A7.16	Middleware - Application Library	ACE	http://www.dre.vanderbilt.edu/~schmidt/ACE.html	6.0.2	Custom Attribution License
Common Software Repository - PERL						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO-Prompter	http://www.cpan.org/	0.004012	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Pegex	http://www.cpan.org/	0.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN YAML-LibYAML	http://www.cpan.org/	0.41	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Class-Singleton	http://www.cpan.org	1.4	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Expect	http://www.cpan.org/	1.21	Artistic License 1.0 (Artistic-1.0)
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Net-OpenSSH	http://www.cpan.org/	0.62	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Algorithm-Diff	http://www.cpan.org/	1.1902	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO-Prompt	http://www.cpan.org	0.997001	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Tie-IxHash	http://www.cpan.org/	1.23	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN AppConfig	http://www.cpan.org/	1.66	Artistic License 1.0 (Artistic-1.0)
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-SAX	http://www.cpan.org	0.96	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-Parser	http://www.cpan.org	2.4	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-NamespaceSupport	http://www.cpan.org	1.11	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Net-DNS	http://www.cpan.org	0.66	Artistic License 1.0 (Artistic-1.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN bignum	http://www.cpan.org/	0.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Attribute-Handlers	http://www.cpan.org/	0.88	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Class-Inner	http://www.cpan.org	0.200001	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-Simple	http://www.cpan.org	2.18	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Perl-Tidy	http://www.cpan.org	20090616	GNU General Public License Version 2.0 or Later (GPL-2.0+)
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN PathTools	http://www.cpan.org	3.33	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Pod-Coverage	http://www.cpan.org	0.21	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Time-HiRes	http://www.cpan.org	1.9721	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN MIME-Base64	http://www.cpan.org	3.09	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Math-BigRat	http://www.cpan.org	0.26	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-LibXML-Common	http://www.cpan.org	0.13	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN XML-LibXML	http://www.cpan.org	1.7	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN version	http://www.cpan.org	0.83	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN want	http://www.cpan.org	0.18	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Template-Toolkit	http://www.cpan.org	2.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Params-Validate	http://www.cpan.org	0.95	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Sub-Uplevel	http://www.cpan.org	0.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Text-Diff	http://www.cpan.org	1.37	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Warn	http://www.cpan.org	0.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Module-Build	http://www.cpan.org	0.3607	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN URI	http://www.cpan.org	1.56	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Net-IP	http://www.cpan.org	1.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Tree-DAG_Node	http://www.cpan.org	1.06	Artistic License 2.0 (Artistic-2.0)
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Compress-Raw-Bzip2	http://www.cpan.org	2.031	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Pod	http://www.cpan.org	1.44	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Inter	http://www.cpan.org	1.01	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Regexp-Common	http://www.cpan.org	2010010201	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Pod-Coverage	http://www.cpan.org	1.08	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Pod-Escapes	http://www.cpan.org	1.04	Perl License
Common_Software_Repository_PERL	A7.16	Logging Services	CPAN Sys-Syslog	http://www.cpan.org	0.27	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Pod-Simple	http://www.cpan.org	3.14	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Unit	http://www.cpan.org	0.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN TermReadKey	http://www.cpan.org	2.3	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Compress-Raw-Zlib	http://www.cpan.org	2.03	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Date-Manip	http://www.cpan.org	6.13	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN DateTime	http://www.cpan.org	0.63	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test	http://www.cpan.org	1.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Differences	http://www.cpan.org	0.5	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Exception	http://www.cpan.org	0.31	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Simple	http://www.cpan.org	0.96	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Test-Harness	http://www.cpan.org	3.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Config-Properties	http://www.cpan.org	1.71	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Devel-Symdump	http://www.cpan.org	2.08	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO-Compress	http://www.cpan.org	2.03	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Digest	http://www.cpan.org	1.16	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN DateTime-Locale	http://www.cpan.org	0.45	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Curses	http://www.cpan.org	1.28	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN DateTime-TimeZone	http://www.cpan.org	1.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Error	http://www.cpan.org	0.17016	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Clone	http://www.cpan.org	0.31	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Digest-MD5	http://www.cpan.org	2.51	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN File-Temp	http://www.cpan.org	0.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO-stringy	http://www.cpan.org	2.11	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN HTML-Tagset	http://www.cpan.org	3.2	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN ExtUtils-CBuilder	http://www.cpan.org	0.2703	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN HTML-Parser	http://www.cpan.org	3.68	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Devel-Cover	http://www.cpan.org	0.73	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO	http://www.cpan.org	1.25	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN ExtUtils-MakeMaker	http://www.cpan.org	6.56	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN libwww-perl	http://www.cpan.org	5.837	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Math-BigInt	http://www.cpan.org	1.96	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Digest-HMAC	http://www.cpan.org	1.02	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Digest-SHA	http://www.cpan.org	5.48	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN IO-Tty	http://www.cpan.org	1.07	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Log-Dispatch-FileRotate	http://www.cpan.org	1.19	Perl License
Common_Software_Repository_PERL	A7.16	Logging Services	CPAN Log-Log4perl	http://www.cpan.org	1.3	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN List-MoreUtils	http://www.cpan.org	0.22	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Log-Dispatch	http://www.cpan.org	2.27	Perl License
Common_Software_Repository_PERL	A7.16	Middleware - Application Library	CPAN Digest-SHA	http://www.cpan.org	5.48	Perl License
Generic Application Server (GAS) - Common Solaris						
GAS	A7.16	Operating System	Solaris	http://www.sun.com/software/solaris/freeware/#supported	Solaris 10.x	Commercial License + Mulitple OSS Licenses

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	popt library is for parsing	popt	http://www.sunfreeware.com/	1.14	MIT
GAS	A7.16	Elevate Privileges	sudo	http://www.sunfreeware.com/	1.7.4p6	ISC Style
GAS	A7.16	synchronizes files and directories	rsync	http://www.sunfreeware.com	2.6.9	GPLv2
GAS	A7.16	Windows Interoperability Services	Samba	http://www.sunfreeware.com	3.0.33	GPLv2
GAS	A7.16	Security Services	Kerberos	http://www.sunfreeware.com	Solaris Kerberos (based on MIT Kerberos 5 release 1.4.0)	BSD Type
GAS	A7.16	native language support	libintl	http://www.sunfreeware.com/	3.4.0	LGPLv2.1
GAS	A7.16	conversion library	libiconv	http://www.sunfreeware.com/	1.11	LGPLv2.0
GAS	A7.16	runtime library	libgcc	http://www.sunfreeware.com/	3.4.6	LGPLv2.1
GAS	A7.16	interpret debugging data	Libdwarf	http://reality.sgiweb.org/davea/dwarf.html	20081013	LGPLv2.1
GAS	A7.16	XML Parser	expat	http://expat.sourceforge.net/	2.0.1	MIT
GAS	A7.16	Protocol Stack	NET-SNMP	http://www.net-snmp.org	5.3.0.1 (Motorola Solutions Modified and Maintained)	BSD Type
GAS	A7.16	Communication Framework	ACE	http://www.cs.wustl.edu/~schmidt/	6.0.2	ACE/TAO License
GAS	A7.16	Communication Framework	TAO	http://www.cs.wustl.edu/~schmidt/	2.0.2	ACE/TAO License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	Libraries	Oracle Studio/Solaris Redistributables	http://www.oracle.com/technetwork/server-storage/solarisstudio	Version 12 Update 1	Oracle/Sun Binary and Supplemental Licenses http://developers.sun.com/sunstudio/documentation/ss12u1/mr/READMEs/runtime.libraries.html http://developers.sun.com/sunstudio/documentation/ss12u1/THIRDPARTYLICENSEREADME.txt
GAS	A7.16	Secure Communications and Encryption Libraries	OpenSSL	http://www.sunfreeware.com	1.0.0b	BSD Type
GAS	A7.16	Java Runtime Environment	Java JRE	http://java.sun.com/	1.4.x, 1.5.x, 1.6.x (provided by Solaris)	Commercial License + Oracle (Sun) Binary and Supplemental Licenses
GAS	A7.16	Support modules	Algorithm-Diff	http://search.cpan.org/dist/Algorithm-Diff-1.1902/	1.1902	Perl License
GAS	A7.16	Support modules	AppConfig	http://search.cpan.org/dist/AppConfig-1.66/	1.66	Perl License
GAS	A7.16	Support modules	Attribute-Handlers	http://search.cpan.org/~smueller/Attribute-Handlers-0.88/	0.88	Perl License
GAS	A7.16	Support modules	bignum	http://search.cpan.org/dist/bignum-0.25/	0.25	Perl License
GAS	A7.16	Support modules	Class-Inner	http://search.cpan.org/~arunbear/Class-Inner-0.200001/	0.200001	Perl License
GAS	A7.16	Support modules	Class-Singleton	http://search.cpan.org/dist/Class-Singleton-1.4/	1.4	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	Support modules	Clone	http://search.cpan.org/dist/Clone-0.31/	0.31	Perl License
GAS	A7.16	Support modules	Compress-Raw-Bzip2	http://search.cpan.org/dist/Compress-Raw-Bzip2-2.031/	2.031	Perl License
GAS	A7.16	Support modules	Compress-Raw-Zlib	http://search.cpan.org/dist/Compress-Raw-Zlib-2.030/	2.03	Perl License
GAS	A7.16	Support modules	Config-Properties	http://search.cpan.org/dist/Config-Properties-1.71/	1.71	Perl License
GAS	A7.16	Support modules	Curses	http://search.cpan.org/dist/Curses-1.28/	1.28	Perl License
GAS	A7.16	Support modules	Date-Manip	http://search.cpan.org/dist/Date-Manip-6.13/	6.13	Perl License
GAS	A7.16	Support modules	DateTime	http://search.cpan.org/dist/DateTime-0.63/	0.63	Perl License
GAS	A7.16	Support modules	DateTime-Locale	http://search.cpan.org/dist/DateTime-Locale-0.45/	0.45	Perl License
GAS	A7.16	Support modules	DateTime-TimeZone	http://search.cpan.org/dist/DateTime-TimeZone-1.22/	1.22	Perl License
GAS	A7.16	Support modules	Devel-Cover	http://search.cpan.org/~pjcj/Devel-Cover-0.73/	0.73	Perl License
GAS	A7.16	Support modules	Devel-Symdump	http://search.cpan.org/dist/Devel-Symdump-2.07/	2.08	Perl License
GAS	A7.16	Support modules	Digest	http://search.cpan.org/	1.16	Perl License
GAS	A7.16	Support modules	Digest-HMAC	http://search.cpan.org/dist/Digest-HMAC-1.01/	1.02	Perl License
GAS	A7.16	Support modules	Digest-MD5	http://search.cpan.org/~gaas/Digest-MD5-2.39/	2.51	Perl License
GAS	A7.16	Support modules	Digest-SHA	http://search.cpan.org/~mshelor/Digest-SHA-5.48/	5.48	Perl License
GAS	A7.16	Support modules	Digest-SHA1	http://search.cpan.org/~gaas/Digest-SHA1-2.13/	2.13	Perl License
GAS	A7.16	Support modules	Error	http://search.cpan.org/~shlomif/Error-0.17016/	0.17016	Perl License
GAS	A7.16	Support modules	expat	http://expat.sourceforge.net/	2.0.1	MIT
GAS	A7.16	Support modules	ExtUtils-CBuilder	http://search.cpan.org/dist/ExtUtils-CBuilder-0.2703/	0.2703	Perl License
GAS	A7.16	Support modules	ExtUtils-MakeMaker	http://search.cpan.org/dist/ExtUtils-MakeMaker-6.54/	6.56	Perl License
GAS	A7.16	Support modules	File-Temp	http://search.cpan.org/dist/File-Temp-0.21/	0.22	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	Support modules	HTML-Parser	http://search.cpan.org/dist/HTML-Parser-3.68/	3.68	Perl License
GAS	A7.16	Support modules	HTML-Tagset	http://search.cpan.org/dist/HTML-Tagset-3.20/	3.2	Perl License
GAS	A7.16	Support modules	IO	http://search.cpan.org/dist/IO-1.25/	1.25	Perl License
GAS	A7.16	Support modules	IO-Compress	http://search.cpan.org/dist/IO-Compress-2.030/	2.03	Perl License
GAS	A7.16	Support modules	IO-Prompt	http://search.cpan.org/dist/IO-Prompt-v0.997001/	0.997001	Perl License
GAS	A7.16	Support modules	IO-stringy	http://search.cpan.org/dist/IO-stringy-2.110/	2.11	Perl License
GAS	A7.16	Support modules	IO-Tty	http://search.cpan.org/dist/IO-Tty-1.07/	1.07	Perl License
GAS	A7.16	Support modules	libwww-perl	http://search.cpan.org/dist/libwww-perl-5.837/	5.837	Perl License
GAS	A7.16	Support modules	List-MoreUtils	http://search.cpan.org/dist/List-MoreUtils-0.22/	0.22	Perl License
GAS	A7.16	Support modules	Log-Dispatch	http://search.cpan.org/dist/Log-Dispatch-2.27/	2.27	Perl License
GAS	A7.16	Support modules	Log-Dispatch-FileRotate	http://search.cpan.org/dist/Log-Dispatch-FileRotate-1.19/	1.19	Perl License
GAS	A7.16	Support modules	Log-Log4perl	http://search.cpan.org/dist/Log-Log4perl-1.30/	1.3	Perl License
GAS	A7.16	Support modules	Math-BigInt	http://search.cpan.org/dist/Math-BigInt-1.96/	1.96	Perl License
GAS	A7.16	Support modules	Math-BigRat	http://search.cpan.org/dist/Math-BigRat-0.26/	0.26	Perl License
GAS	A7.16	Support modules	MIME-Base64	http://search.cpan.org/~gaas/MIME-Base64-3.09/	3.09	Perl License
GAS	A7.16	Support modules	Module-Build	http://search.cpan.org/dist/Module-Build-0.3607/	0.3607	Perl License
GAS	A7.16	Support modules	Net-DNS	http://search.cpan.org/dist/Net-DNS-0.66/	0.66	Perl License
GAS	A7.16	Support modules	Net-IP	http://search.cpan.org/dist/Net-IP-1.25/	1.25	Perl License
GAS	A7.16	Support modules	Params-Validate	http://search.cpan.org/dist/Params-Validate-0.95/	0.95	Perl License
GAS	A7.16	Support modules	PathTools	http://search.cpan.org/dist/PathTools-3.33/	3.33	Perl License
GAS	A7.16	script based parsing	Perl-Tidy	http://search.cpan.org/~shancock/Perl-Tidy-20090616/	20090616	GPLv2

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	Support modules	Pod-Coverage	http://search.cpan.org/dist/Pod-Coverage-0.21/	0.21	Perl License
GAS	A7.16	Support modules	Pod-Escapes	http://search.cpan.org/dist/Pod-Escapes-1.04/	1.04	Perl License
GAS	A7.16	Support modules	Pod-Simple	http://search.cpan.org/~dwheeler/Pod-Simple-3.14/	3.14	Perl License
GAS	A7.16	Support modules	Regexp-Common	http://search.cpan.org/dist/Regexp-Common-2010010201/	2010010201	MIT
GAS	A7.16	Support modules	Sub-Uplevel	http://search.cpan.org/~dagolden/Sub-Uplevel-0.22/	0.22	Perl License
GAS	A7.16	Support modules	Sys-Syslog	http://search.cpan.org/dist/Sys-Syslog-0.27/	0.27	Perl License
GAS	A7.16	Support modules	Template-Toolkit	http://search.cpan.org/dist/Template-Toolkit-2.22/	2.22	Perl License
GAS	A7.16	Support modules	TermReadKey	http://search.cpan.org/dist/TermReadKey-2.30/	2.3	Perl License
GAS	A7.16	Support modules	Test	http://search.cpan.org/dist/Test-1.25/	1.25	Perl License
GAS	A7.16	Support modules	Test-Differences	http://search.cpan.org/dist/Test-Differences-0.500/	0.5	Perl License
GAS	A7.16	Support modules	Test-Exception	http://search.cpan.org/~adie/Test-Exception-0.31/	0.31	Perl License
GAS	A7.16	Support modules	Test-Harness	http://search.cpan.org/dist/Test-Harness-3.22/	3.22	Perl License
GAS	A7.16	Support modules	Test-Inter	http://search.cpan.org/dist/Test-Inter-1.01/	1.01	Perl License
GAS	A7.16	Support modules	Test-Pod	http://search.cpan.org/dist/Test-Pod-1.44/	1.44	Perl License
GAS	A7.16	Support modules	Test-Pod-Coverage	http://search.cpan.org/dist/Test-Pod-Coverage-1.08/	1.08	Perl License
GAS	A7.16	Support modules	Test-Simple	http://search.cpan.org/dist/Test-Simple-0.96/	0.96	Perl License
GAS	A7.16	Support modules	Test-Unit	http://search.cpan.org/dist/Test-Unit-0.25/	0.25	Perl License
GAS	A7.16	Support modules	Test-Warn	http://search.cpan.org/~chorny/Test-Warn-0.22/	0.22	Perl License
GAS	A7.16	Support modules	Text-Diff	http://search.cpan.org/dist/Text-Diff-1.37/	1.37	Perl License
GAS	A7.16	Support modules	Time-HiRes	http://search.cpan.org/dist/Time-HiRes-1.9721/	1.9721	Perl License
GAS	A7.16	Support modules	Tree-DAG_Node	http://search.cpan.org/~cogent/Tree-DAG_Node-1.06/	1.06	Perl License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GAS	A7.16	Support modules	URI	http://search.cpan.org/dist/URI-1.56/	1.56	Perl License
GAS	A7.16	Support modules	version	http://search.cpan.org/dist/version-0.83/	0.83	Perl License
GAS	A7.16	Support modules	Want	http://search.cpan.org/dist/Want-0.18/	0.18	Perl License
GAS	A7.16	Support modules	XML-LibXML	http://search.cpan.org/dist/XML-LibXML-1.70/	1.7	Perl License
GAS	A7.16	Support modules	XML-LibXML-Common	http://search.cpan.org/dist/XML-LibXML-Common-0.13/	0.13	Perl License
GAS	A7.16	Support modules	XML-NamespaceSupport	http://search.cpan.org/dist/XML-NamespaceSupport-1.11/	1.11	Perl License
GAS	A7.16	Support modules	XML-Parser	http://search.cpan.org/dist/XML-Parser-2.40/	2.4	Perl License
GAS	A7.16	Support modules	XML-SAX	http://search.cpan.org/dist/XML-SAX-0.96/	0.96	Perl License
GAS	A7.16	Support modules	XML-Simple	http://search.cpan.org/dist/XML-Simple-2.18/	2.18	Perl License
Motorola Common SNMP Agent						
CommonAgent	A7.16	Middleware - Application Library	OpenBSD OS Includes/Headers	http://www.openbsd.org	4	BSD 3-Clause License ("Modified" BSD)
CommonAgent	A7.16	Network Management Technologies	Net-SNMP	http://www.net-snmp.org	5.3.0.1	BSD 3-Clause License ("Modified" BSD)
Motorola SNMP Agent (MotoAgent)						
MotoAgent	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
MotoAgent	A7.16	Database Technologies - Application	HyperSQL	http://hsqldb.org	2.2.1	BSD 4-Clause License ("Original" BSD)
MotoAgent	A7.16	Logging Services	log4cplus	http://sourceforge.net/projects/log4cplus	1.0.2	Apache License 1.1 (Apache-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MotoAgent	A7.16	Network Management Technologies	Net-SNMP	http://www.net-snmp.org	5.3.0.1	BSD 3-Clause License ("Modified" BSD)
MotoAgent	A7.16	Middleware - Application Library	expat	http://expat.sourceforge.net/	2.0.0	MIT License (MIT)
Motorola Common License Library (CLL)						
Common_License_Layer_Library	A7.16	Connectivity - Networking Services	libcurl	http://curl.haxx.se/	7.35.0	MIT License (MIT)
Common_License_Layer_Library	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
Common_License_Layer_Library	A7.16	Web Technologies	Axis2/C	http://axis.apache.org/axis2/c/core/	1.6.0	Apache License 2.0 (Apache-2.0)
Common_License_Layer_Library	A7.16	Middleware - Application Library	Flexera Software - FlexNet Embedded (Open Source Content)	http://www.flexerasoftware.com	5.x	Commercial + OSS
Motorola Password Vault						
Password_Vault	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1l	OpenSSL License
Password_Vault	A7.16	Middleware - Application Library	SimpleOpt	http://code.google.com/p/simpleopt	3.4	MIT License (MIT)
Password_Vault	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
Motorola Common AAA API+D626						
AAA_API	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
Motorola Certificate Generation Deployment Tool						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CGD	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1l	OpenSSL License
Motorola Common OPA Agent						
Common_OPA_Agent	A7.16	Security - Applications/Services	Python PAM	http://atlee.ca/software/pam/	0.1.3	MIT License (MIT)
Common_OPA_Agent	A7.16	Middleware - Application Library	Python WMI	https://pypi.python.org/pypi/WMI/	1.4.9	MIT License (MIT)
Common_OPA_Agent	A7.16	Middleware - Application Library	Python lxml	http://lxml.de/	2.2.8	BSD 3-Clause License ("Modified" BSD)
Common_OPA_Agent	A7.16	Middleware - Application Library	Python	https://www.python.org/	2.6.6	PYTHON License v2.0
Common_OPA_Agent	A7.16	User Interface Technologies	wxPython	http://www.wxpython.org/	2.8	GNU Library General Public License v2 or Later (LGPL-2.0+)
Common VMWare Virtualization Platform						
Common_VMWare_Virtualization_Platform	A7.16	Middleware - Application Library	vSphere CLI	https://my.vmware.com/web/vmware/details?downloadGroup=VCLI550&productId=352	5.5.x	Custom
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	esxcli-shell-offline_bundle	http://www.v-front.de/2013/01/release-esxcli-plugin-to-run-arbitrary.html	1.1.0-15	GNU General Public License Version 3.0 or Later (GPL-3.0+)
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	vSphere ESXi	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses

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Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	vCenter Server on Linux Virtual Appliance	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	vSphere Update Manager	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	VDDK	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	PowerCLI	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses
Common_VMWare_Virtualization_Platform	A7.16	Virtualization Technologies	VIX API	http://www.vmware.com	5.5.x	Commercial License + Mulitple OSS Licenses
Windows Supplemental CD						
WINDOWS_SUPPLEMENTAL	A7.16	User Interface Technologies	WxWidgets	http://www.wxwidgets.org	2.8.12	GNU Library General Public License v2 or Later (LGPL-2.0+)
WINDOWS_SUPPLEMENTAL	A7.16	Middleware - Application Library	Motorola Common Cygwin	http://www.cygwin.com	04.05.00(Cygwin 1.7.33-1)	GNU General Public License Version 3.0 or Later (GPL-3.0+)
WINDOWS_SUPPLEMENTAL	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1l	OpenSSL License
WINDOWS_SUPPLEMENTAL	A7.16	Middleware - Application Library	Oracle Java7 JRE	http://www.oracle.com	1.7.0_79	Commercial + OSS Licenses
WINDOWS_SUPPLEMENTAL	A7.16	Middleware - Application Library	Oracle Java8 JRE	http://www.oracle.com	1.8.0_45	Commercial + OSS Licenses

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
WINDOWS_SUPPLEMENTAL	A7.16	Web Technologies	Internet Explorer	http://windows.microsoft.com/en-us/internet-explorer/download-ie	11.x	Microsoft Distribution License + End User License
WINDOWS_SUPPLEMENTAL	A7.16	Security - Applications/Services	WinSCP	http://winscp.net	5.5.6	GNU General Public License Version 3.0 or Later (GPL-3.0+)
WINDOWS_SUPPLEMENTAL	A7.16	Middleware - Application Library	.NET framework	http://www.microsoft.com/NET/	4.5.2	Microsoft Distribution License + End User License
WINDOWS_SUPPLEMENTAL	A7.16	Middleware - Application Library	OpenJDK - Windows	http://openjdk.java.net	1.8 u20	GNU General Public License Version 2.0 or Later (GPL-2.0+) + CLASSPATH Exception
WINDOWS_SUPPLEMENTAL	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+) + UNRAR License
WINDOWS_SUPPLEMENTAL	A7.16	Logging Services	Motorola Snare	http://sourceforge.net/projects/snare	4.0.1.1 (Snare 4.0.1.1)	GNU General Public License Version 2.0 or Later (GPL-2.0+)
WINDOWS_SUPPLEMENTAL	A7.16	Office/Document Processing	Adobe Reader	http://www.adobe.com	11.x	Adobe Distribution License + End User License
WINDOWS_SUPPLEMENTAL	A7.16	Security - Applications/Services	Motorola PuTTY	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	0.63.03 (PuTTY 0.63)	MIT License (MIT)
WINDOWS_SUPPLEMENTAL	See Motorola Common SNMP Agent					
WINDOWS_SUPPLEMENTAL	See Motorola Common License Library					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
WINDOWS_SUPPLEMENTAL	See Motorola Password Vault					
WINDOWS_SUPPLEMENTAL	See Motorola Common AAA API					
WINDOWS_SUPPLEMENTAL	See Motorola Certificate Generation Deployment Tool					
Backup and Restore Server						
BAR_Server	See Motorola Common SNMP Agent					
BAR_Server	See Motorola Password Vault					
BAR_Server	See Common Red Hat Linux Platform (RHEL6.x)					
BAR_Server	See Common Software Repository - PERL					
Central Logging Server						
SYSLOG_Server	A7.16	Web Technologies	jQuery-UI	http://jqueryui.com	1.10.3	MIT License (MIT)
SYSLOG_Server	A7.16	Web Technologies	mod_authnz_external	http://code.google.com/p/mod-auth-external	3.2.5	Apache License 1.1 (Apache-1.1)

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SYSLOG_Server	A7.16	Web Technologies	pwauth	http://code.google.com/p/pwauth	2.3.8	BSD 3-Clause License ("Modified" BSD)
SYSLOG_Server	A7.16	Web Technologies	jQuery	http://jquery.com/	1.9.1	MIT License (MIT)
SYSLOG_Server	A7.16	Web Technologies	jscalendar	http://www.dynarch.com/static/jscalendar-1.0.zip	1	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
SYSLOG_Server	See Motorola Common AAA API					
SYSLOG_Server	See Common Software Repository - PERL					
SYSLOG_Server	See Common Red Hat Linux Platform (RHEL6.x)					
Firewall Management Server						
Juniper_FWM_Server	See Common Software Repository - PERL					
Juniper_FWM_Server	See Motorola Common SNMP Agent					
Juniper_FWM_Server	See Common Red Hat Linux Platform (RHEL5.x)					
Domain Controller / AAA Server						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
AAA_Server	See Motorola Common Password Vault					
AAA_Server	See Motorola Common AAA API					
AAA_Server	See Motorola Common SNMP Agent					
AAA_Server	See Windows Supplemental CD					
InfoVista Server						
INFOVISTA_Server	A7.16	Middleware - Application Library	Strawberry PERL	http://strawberryperl.com	5.12.0	Perl License
INFOVISTA_Server	See Windows Supplemental CD					
Core Security Management Server (CSMS)						
CSMS	A7.16	Database Technologies - Application	Microsoft SQL Server Express	http://www.microsoft.com/en-us/server-cloud/products/sql-server-editions/	2008 R2	Microsoft Distribution License + End User License
CSMS	See Motorola Common Password Vault					

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CSMS	See Motorola Common SNMP Agent					
CSMS	See Windows Supplemental CD					
IP Packet Capture Server (IPCAP)						
IPCAP_Server	A7.16	Data Compression	Zip4j	http://www.lingala.net/zip4j/	1.3.1	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Web Technologies	angular-ui-bootstrap	http://angular-ui.github.io/bootstrap/	0.10.0	MIT License (MIT)
IPCAP_Server	A7.16	Web Technologies	angularJS	http://angularjs.org/	1.2.26	MIT License (MIT)
IPCAP_Server	A7.16	Web Technologies	angular-xeditable	http://vitalets.github.io/angular-xeditable/#	0.1.1.8	MIT License (MIT)
IPCAP_Server	A7.16	Security - Applications/Services	SPNEGO	http://spnego.sourceforge.net	r7	GNU Lesser General Public License v3 or Later (LGPL-3.0+)
IPCAP_Server	A7.16	Web Technologies	jersey-common	http://jersey.java.net/	2.0-m05-1	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Web Technologies	jersey-media-json	http://jersey.java.net/	2.0-m05-1	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Web Technologies	jersey-jax-rs-ri	http://jersey.java.net/	2.0-rc1	Common Development and Distribution License 1.1 (CDDL-1.1)

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IPCAP_Server	A7.16	Web Technologies	jaxb-api	https://jaxb.java.net/	2.2.2	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	jettison	http://jettison.codehaus.org/	1.1	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Web Technologies	jaxb-impl	https://jaxb.java.net/	2.2.3-1	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Logging Services	SLF4J	http://www.slf4j.org	1.7.7	MIT License (MIT)
IPCAP_Server	A7.16	Middleware - Application Library	Joda-Time	http://www.joda.org/joda-time/	2.5	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-core	http://jackson.codehaus.org/	1.9.2	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-annotations	http://wiki.fasterxml.com/JacksonHome	2.4.0	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-jaxrs	http://jackson.codehaus.org/	1.9.2	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-mapper	http://jackson.codehaus.org/	1.9.2	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-databind	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-xc	http://jackson.codehaus.org/	1.9.2	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-module-jaxb-annotations	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-jaxrs-json-provider	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-jaxrs-base	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Jackson-core	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Guava	https://code.google.com/p/guava-osgi/	11.0.1	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	Javassist	http://www.javassist.org/	3.18.1.GA	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.external.javax.inject	https://java.net/projects/hk2	2.3.0-b10	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.api	https://hk2.java.net	2.3.0-b10	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.locator	https://hk2.java.net	2.3.0-b10	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.utils	https://hk2.java.net	2.3.0-b10	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.external.asm-all-repackaged	https://java.net/projects/hk2	2.1.9	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.external.aopalliance-repackaged	https://java.net/projects/hk2	2.3.0-b10	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
IPCAP_Server	A7.16	Web Technologies	javax.json	http://jsonp.java.net	1.0.4	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Security - Cryptography	BouncyCastle - Java	http://www.bouncycastle.org	1.51	MIT License (MIT)
IPCAP_Server	A7.16	Middleware - Application Library	javax.ws.rs-api	https://jax-rs-spec.java.net/	2.0.1	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.1.0.Final	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	javax.activation	http://java.sun.com/products/javabeans/jaf/index.jsp	1.1, 1.2	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Web Technologies	javax.inject	https://code.google.com/p/atinject/	1	Apache License 2.0 (Apache-2.0)
IPCAP_Server	A7.16	Middleware - Application Library	hk2.osgi-resource-locator	https://java.net/projects/hk2	1.0.1	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	A7.16	Middleware - Application Library	javax.annotation-api	https://jcp.org/en/jsr/detail?id=250	1.2	Common Development and Distribution License 1.1 (CDDL-1.1)
IPCAP_Server	See Motorola Common Password Vault					
IPCAP_Server	See Motorola Common SNMP Agent					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
IPCAP_Server	See Motorola Common AAA API					
IPCAP_Server	See Common Software Repository - PERL					
IPCAP_Server	See Common Red Hat Linux Platform (RHEL6.x)					
Common DESU Server						
Common_DESU_Server	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org/	7.0.56	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Apache commons-compress	http://commons.apache.org/compress/	1.9	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Apache commons-net	http://commons.apache.org/net/	3.3	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Apache commons-io	http://commons.apache.org/proper/commons-io/	2.4	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Database Technologies - Embedded	HyperSQL	http://hsqldb.org/	2.3.2	Custom
Common_DESU_Server	A7.16	Logging Services	SLF4J	http://www.slf4j.org	1.7.7	MIT License (MIT)
Common_DESU_Server	A7.16	Middleware - Application Library	EclipseLink MOXy	http://www.eclipse.org/eclipselink/moxy.php	2.5.2	Eclipse Public License 1.0 (EPL-1.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Guava	https://code.google.com/p/guava-libraries/	18	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	JGraphT	hhttps://github.com/jgrapht/jgrapht	0.8.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_DESU_Server	A7.16	Middleware - Application Library	Apache commons-lang	http://commons.apache.org/proper/commons-lang/	2.6	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Web Technologies	Apache Wicket	http://wicket.apache.org/	6.18.0	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Web Technologies	Seam Framework	http://seamframework.org/	3.0.0	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Guice	http://code.google.com/p/google-guice/	2	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.1	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Web Technologies	jersey	http://jersey.java.net/	1.4	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_DESU_Server	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	4.1.2.RELEASE	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	hibernate	http://hibernate.org	3.6.0.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
Common_DESU_Server	A7.16	Middleware - Application Library	Weld	http://weld.cdi-spec.org/	1.1.27.Final	Apache License 2.0 (Apache-2.0)
Common_DESU_Server	A7.16	Middleware - Application Library	JAXB	https://jaxb.dev.java.net/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_DESU_Server	See Common Software Repository - PERL					
Common_DESU_Server	See Common Red Hat Linux Platform (RHEL6.x)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_DESU_Server	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Common License Management Server						
Common_License_Management_Server	A7.16	Middleware - Application Library	CPAN Net-STOMP-Client	http://search.cpan.org/~lcons/Net-STOMP-Client/	2.2	Perl License
Common_License_Management_Server	A7.16	Middleware - Application Library	ActiveMQ-CPP	http://activemq.apache.org/cms/	3.8.3	Apache License 2.0 (Apache-2.0)
License_Manager_UI	A7.16	Web Technologies	Apache Tomcat Web Server (embedded)	http://tomcat.apache.org/	7.0.57	Apache License 2.0 (Apache-2.0)
License_Manager_UI	A7.16	Security - Applications/Services	SPNEGO	http://spnego.sourceforge.net	r7	GNU Lesser General Public License v3 or Later (LGPL-3.0+)
License_Manager_UI	A7.16	Middleware - Application Library	javax.ws.rs-api	https://jax-rs-spec.java.net/	2.0-rc3	Common Development and Distribution License 1.1 (CDDL-1.1)
License_Manager_UI	A7.16	Web Technologies	Apache Wicket	http://wicket.apache.org	6.12.0	Apache License 2.0 (Apache-2.0)
Common_License_Management_Server	See Motorola Common Password Vault					
Common_License_Management_Server	See Motorola Common SNMP Agent					
Common_License_Management_Server	See Motorola Common AAA API					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_License_Management_Server	See Common Software Repository - PERL					
Common_License_Management_Server	See Common Red Hat Linux Platform (RHEL6.x)					
Common_License_Management_Server	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Authentication Center (AuC) Server						
AuC_Server	A7.16	Web Technologies	WildFly	http://wildfly.org	8.2.0.Final	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.2.10	PostgreSQL License (PostgreSQL)
AuC_Server	A7.16	Middleware - Application Library	JNA	https://jna.java.net	4.1.0	Apache License 2.0 (Apache-2.0)
AuC_Server	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
AuC_Server	A7.16	Network Management Technologies	snmp4j	http://www.snmp4j.org/	2.1.0_2	Apache License 2.0 (Apache-2.0)
AuC_Server	A7.16	Middleware - Application Library	Apache commons-procrun	https://commons.apache.org/daemon/procrun.html	1.0.15	Apache License 2.0 (Apache-2.0)
AuC_Server	A7.16	Middleware - Application Library	hamcrest (JavaHamcrest)	https://code.google.com/p/hamcrest/	1.3	BSD 3-Clause License ("Modified" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
AuC_Server	A7.16	User Interface Technologies	Swing Wizard Framework	http://java.net/projects/wizard-framework	0.1.12	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	Network Management Technologies	JoeSNMP	http://sourceforge.net/projects/joesnmp	0.3.4	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	User Interface Technologies	Spin	http://spin.sourceforge.net	1.5	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	User Interface Technologies	Swing-Layout	http://java.net/projects/swing-layout	1.0.4	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	User Interface Technologies	JCalendar	http://www.toedter.com/en/jcalendar/index.html	1.3.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	Network Management Technologies	AgentAPI	http://sourceforge.net/projects/agentapi	0.9	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Server	A7.16	Middleware - Application Library	Python for Windows Extensions	http://sourceforge.net/projects/pywin32	217	PYTHON License v2.0
AuC_Server	A7.16	Middleware - Application Library	Python	https://www.python.org	3.2.0	PYTHON License v2.0
AuC_Server	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+) + UNRAR License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
AuC_Server	See Motorola Common SNMP Agent					
AuC_Server	See Motorola Common Password Vault					
AuC_Server	See Windows Supplemental CD					
AuC_Server	See Motorola Common License Library (CLL)					
Authentication Center (AuC) Client						
AuC_Client	A7.16	Web Technologies	WildFly	http://wildfly.org	8.2.0.Final	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Client	A7.16	Middleware - Application Library	JNA	https://jna.java.net	4.1.0	Apache License 2.0 (Apache-2.0)
AuC_Client	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
AuC_Client	A7.16	Network Management Technologies	snmp4j	http://www.snmp4j.org/	2.1.0_2	Apache License 2.0 (Apache-2.0)
AuC_Client	A7.16	Middleware - Application Library	Apache commons-procrun	https://commons.apache.org/daemon/procrun.html	1.0.15	Apache License 2.0 (Apache-2.0)
AuC_Client	A7.16	User Interface Technologies	Spin	http://spin.sourceforge.net	1.5	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
AuC_Client	A7.16	Network Management Technologies	JoeSNMP	http://sourceforge.net/projects/joesnmp	0.3.4	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Client	A7.16	User Interface Technologies	JCalendar	http://www.toedter.com/en/jcalendar/index.html	1.3.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Client	A7.16	Network Management Technologies	AgentAPI	http://sourceforge.net/projects/agentapi	0.9	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
AuC_Client	A7.16	Middleware - Application Library	Apache commons	http://commons.apache.org	3.2.1	Apache License 2.0 (Apache-2.0)
AuC_Client	A7.16	Middleware - Application Library	Python for Windows Extensions	http://sourceforge.net/projects/pywin32	217	PYTHON License v2.0
AuC_Client	A7.16	Middleware - Application Library	Python	https://www.python.org	3.2.0	PYTHON License v2.0
AuC_Client	See Motorola Common Password Vault					
AuC_Client	See Windows Supplemental CD					
Key Management Facility (KMF) Server						
KMF_Server	A7.16	Connectivity - Networking Services	Apache MINA	http://mina.apache.org	2.0.8	Apache License 2.0 (Apache-2.0)
KMF_Server	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.2.10	PostgreSQL License (PostgreSQL)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
KMF_Server	A7.16	Middleware - Application Library	janel	http://sourceforge.net/projects/janel	3.0.2	MIT License (MIT)
KMF_Server	A7.16	Web Technologies	JBOSS-AS	http://www.jboss.org/jbossas	5.1.0GA	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
KMF_Server	A7.16	Middleware - Application Library	Java Service Wrapper	http://wrapper.tanukisoftware.org	3.0.2	MIT License (MIT)
KMF_Server	A7.16	Middleware - Application Library	Strawberry PERL	http://strawberryperl.com	5.10.0	Artistic License 1.0 (Artistic-1.0)
KMF_Server	A7.16	Middleware - Application Library	Python for Windows Extensions	http://sourceforge.net/projects/pywin32	217	PYTHON License v2.0
KMF_Server	A7.16	Middleware - Application Library	Python	https://www.python.org	3.2.0	PYTHON License v2.0
KMF_Server	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+) + UNRAR License
KMF_Server	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xercesj	2.9.0	Apache License 2.0 (Apache-2.0)
KMF_Server	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
KMF_Server	See Motorola Common Password Vault					
KMF_Server	See Windows Supplemental CD					
Key Management Facility (KMF) Client						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
KMF_Client	A7.16	Office/Document Processing	JasperReports	http://jasperforge.org	3.0.0	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
KMF_Client	A7.16	Middleware - Application Library	janel	http://sourceforge.net/projects/janel	3.0.2	MIT License (MIT)
KMF_Client	A7.16	Middleware - Application Library	Python for Windows Extensions	http://sourceforge.net/projects/pywin32	217	PYTHON License v2.0
KMF_Client	A7.16	Middleware - Application Library	Python	https://www.python.org	3.2.0	PYTHON License v2.0
KMF_Client	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+) + UNRAR License
KMF_Client	A7.16	Office/Document Processing	iText	http://sourceforge.net/projects/itext	1.4.7	Mozilla Public License Version 1.1 (MPL-1.1)
KMF_Client	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xerces-j	2.9.0	Apache License 2.0 (Apache-2.0)
KMF_Client	A7.16	Middleware - Application Library	SwingX	https://swingx.java.net	1.6.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
KMF_Client	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
KMF_Client	See Motorola Common Password Vault					
KMF_Client	See Windows Supplemental CD					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
KMF_CRYPTR	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
KMF_CRYPTR	A7.16	Middleware - Application Library	NetBSD CRC32	http://www.netbsd.org	n/a	Public Domain
KVL4000						
KVL4000_Security_Adapter	A7.16	Middleware - Application Library	C Support Libraries	http://www.blunkmicro.com	n/a	BSD 3-Clause License ("Modified" BSD)
KVL4000_Security_Adapter	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
KVL4000_PDA	A7.16	Middleware - Application Library	Smart Device Framework - Community Edition	http://www.opennetcf.com/Products/SmartDeviceFramework/tabid/65/Default.aspx	2.3.12004	Custom
KVL4000_PDA	A7.16	Logging Services	NLog	http://nlog.codeplex.com	2	BSD 3-Clause License ("Modified" BSD)
KVL4000_PDA	A7.16	Engineering and Product Development Tools	Moq	http://code.google.com/p/moq	4.x	BSD 3-Clause License ("Modified" BSD)
KVL4000_PC_Application	A7.16	Logging Services	NLog	http://nlog.codeplex.com	2	BSD 3-Clause License ("Modified" BSD)
KVL4000_PC_Application	A7.16	Connectivity - Networking Services	RAPI2	http://rapi2.codeplex.com	1.2	MIT License (MIT)
CRYPTR Micro SD						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CRYPTR_Micro	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
CRYPTR_Micro	A7.16	Middleware - Application Library	NetBSD CRC32	http://www.netbsd.org	n/a	Public Domain
Packet Data Encryption Gateway (PDEG)						
PDEG	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
PDEG	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
CAI Data Encryption Module (CDEM)						
CDEM	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
CDEM	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
Integrated Voice & Data Packet Data Gateway (IVD_PDG)						
IVD_PDG	A7.16	Web Technologies	CGIC	http://www.boutell.com/cgic	1	Commercial + OSS License
IVD_PDG	A7.16	Middleware - Application Library	LIBIFCONFIG	http://www.pobox.com/~tqbf/	0.1	GNU Library General Public License v2 or Later (LGPL-2.0+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
IVD_PDG	A7.16	Middleware - Application Library	liburcu	https://lttng.org/urcu	0.8.6	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
IVD_PDG	A7.16	Engineering and Product Development Tools	LTTng-UST	http://lttng.org	2.5.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
IVD_PDG	A7.16	Engineering and Product Development Tools	Babeltrace	http://www.efficios.com/babeltrace	1.2.4	MIT License (MIT)
IVD_PDG	A7.16	Engineering and Product Development Tools	LTTng-Tools	http://lttng.org	2.5.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
IVD_PDG	A7.16	Engineering and Product Development Tools	LTTng-docs	http://lttng.org	2.5	Creative Commons Attribution Unported License v3.0
IVD_PDG	See Motorola Common SNMP Agent					
IVD_PDG	See Motorola SNMP Agent (MotoAgent)					
IVD_PDG	See Motorola Common Password Vault					
IVD_PDG	See Common Software Repository - PERL					
IVD_PDG	See Common Red Hat Linux Platform (RHEL6.x)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Conventional Packet Data Gateway (CONV_PDG)						
CONV_PDG	A7.16	Web Technologies	CGIC	http://www.boutell.com/cgic	1	Commercial + OSS License
CONV_PDG	A7.16	Middleware - Application Library	LIBIFCONFIG	http://www.pobox.com/~tqbf/	0.1	GNU Library General Public License v2 or Later (LGPL-2.0+)
CONV_PDG	A7.16	Middleware - Application Library	liburcu	https://lttng.org/urcu	0.8.6	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
CONV_PDG	A7.16	Engineering and Product Development Tools	LTTng-UST	http://lttng.org	2.5.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
CONV_PDG	A7.16	Engineering and Product Development Tools	Babeltrace	http://www.efficios.com/babeltrace	1.2.4	MIT License (MIT)
CONV_PDG	A7.16	Engineering and Product Development Tools	LTTng-Tools	http://lttng.org	2.5.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
CONV_PDG	A7.16	Engineering and Product Development Tools	LTTng-docs	http://lttng.org	2.5	Creative Commons Attribution Unported License v3.0
CONV_PDG	See Motorola Common SNMP Agent					
CONV_PDG	See Motorola SNMP Agent (MotoAgent)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CONV_PDG	See Motorola Common Password Vault					
CONV_PDG	See Common Software Repository - PERL					
CONV_PDG	See Common Red Hat Linux Platform (RHEL6.x)					
High Performance Data (HPD) Packet Data Gateway (HPD_PDG)						
HPD_PDG	A7.16	Web Technologies	CGIC	http://www.boutell.com/cgic	1	Commercial + OSS License
HPD_PDG	A7.16	Middleware - Application Library	LIBIFCONFIG	http://www.pobox.com/~tqbf/	0.1	GNU Library General Public License v2 or Later (LGPL-2.0+)
HPD_PDG	A7.16	Middleware - Application Library	liburcu	https://lttng.org/urcu	0.8.6	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
HPD_PDG	A7.16	Engineering and Product Development Tools	LTTng-UST	http://lttng.org	2.5.2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
HPD_PDG	A7.16	Engineering and Product Development Tools	Babeltrace	http://www.efficios.com/babeltrace	1.2.4	MIT License (MIT)
HPD_PDG	A7.16	Engineering and Product Development Tools	LTTng-Tools	http://lttng.org	2.5.3	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
HPD_PDG	A7.16	Engineering and Product Development Tools	LTTng-docs	http://lttng.org	2.5	Creative Commons Attribution Unported License v3.0
HPD_PDG	See Motorola Common SNMP Agent					
HPD_PDG	See Motorola SNMP Agent (MotoAgent)					
HPD_PDG	See Motorola Common Password Vault					
HPD_PDG	See Common Software Repository - PERL					
HPD_PDG	See Common Red Hat Linux Platform (RHEL6.x)					
Inter System Interconnect Gateway (ISSIG)						
ISSIG	A7.16	DNS Resolver Library	c-ares	http://c-ares.haxx.se/	1.9.1	MIT
ISSIG	A7.16	Protocol Stack	CMU SNMP	http://net-snmp.sourceforge.net	1990	BSD Type
ISSIG	See Motorola Common SNMP Agent					
ISSIG	See Motorola SNMP Agent (MotoAgent)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ISSIG	See Generic Application Server					
ISSI/CSSI 8000 Network Gateway						
ISSIG	A7.16	DNS Resolver Library	c-ares	http://c-ares.haxx.se/	1.9.1	MIT
ISSIG	A7.16	Protocol Stack	CMU SNMP	http://net-snmp.sourceforge.net	1990	BSD Type
ISGW	See Motorola Common SNMP Agent					
ISGW	See Motorola SNMP Agent (MotoAgent)					
ISGW	See Motorola Common Password Vault					
ISGW	See Common Software Repository - PERL					
ISGW	See Common Red Hat Linux Platform (RHEL6.x)					
ISGW	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Zone Controller						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ZC	A7.16	DNS Resolver Library	c-ares	http://c-ares.haxx.se/	1.9.1	MIT
ZC	A7.16	Protocol Stack	CMU SNMP	http://net-snmp.sourceforge.net	1990	BSD Type
ZC	See Motorola Common SNMP Agent					
ZC	See Motorola SNMP Agent (MotoAgent)					
ZC	See Motorola Common Password Vault					
ZC	See Common Software Repository - PERL					
ZC	See Common Red Hat Linux Platform (RHEL6.x)					
ZC	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Air Traffic Router (ATR)						
ATR	A7.16	Middleware - Application Library	JsonCpp	https://github.com/open-source-parsers/jsoncpp	0.7.0	MIT License (MIT)
ATR	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.3.5	PostgreSQL License (PostgreSQL)
ATR	A7.16	Web Technologies	Bootstrap	https://github.com/twbs/bootstrap	3.1.1	MIT License (MIT)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ATR	A7.16	Web Technologies	WildFly	http://wildfly.org	8.2.0.Final	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
ATR	A7.16	Middleware - Application Library	ICU4C	http://icu-project.org	4.2.1	BSD 3-Clause License ("Modified" BSD)
ATR	A7.16	Web Technologies	angular-ui-router	http://angular-ui.github.io/ui-router/	0.2.13	MIT License (MIT)
ATR	A7.16	Security - Applications/Services	SPNEGO	http://spnego.sourceforge.net	r7	GNU Lesser General Public License v3 or Later (LGPL-3.0+)
ATR	A7.16	Web Technologies	angularJS	https://angularjs.org/	1.3.13	MIT License (MIT)
ATR	A7.16	Web Technologies	activemq	http://activemq.apache.org	5.10.0	Apache License 2.0 (Apache-2.0)
ATR	A7.16	Web Technologies	angular-ui-bootstrap	http://angular-ui.github.io/bootstrap/	0.12.0	MIT License (MIT)
ATR	A7.16	Middleware - Application Library	xerces-C++	http://xerces.apache.org/xerces-c	3.1.1	Apache License 2.0 (Apache-2.0)
ATR	A7.16	Network Management Technologies	snmp4j	http://www.snmp4j.org/	2.1.0	Apache License 2.0 (Apache-2.0)
ATR	A7.16	Network Management Technologies	snmp4j-agent	http://www.snmp4j.org/	2.0.6	Apache License 2.0 (Apache-2.0)
ATR	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
ATR	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
ATR	See Motorola Common SNMP Agent					
ATR	See Motorola SNMP Agent (MotoAgent)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ATR	Motorola Common AAA API					
ATR	See Motorola Common Password Vault					
ATR	See Common Software Repository - PERL					
ATR	See Common Red Hat Linux Platform (RHEL6.x)					
ATR	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
ATR	See Motorola Common License Library (CLL)					
System Statistical Server (SSS)						
SSS	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
SSS	A7.16	Middleware - Application Library	ICU4C	http://icu-project.org	4.2.1	BSD 3-Clause License ("Modified" BSD)
SSS	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.3.5	PostgreSQL License (PostgreSQL)
SSS	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
SSS	See Motorola Common SNMP Agent					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
SSS	See Motorola SNMP Agent (MotoAgent)					
SSS	Motorola Common AAA API					
SSS	See Motorola Common Password Vault					
SSS	See Common Software Repository - PERL					
SSS	See Common Red Hat Linux Platform (RHEL6.x)					
SSS	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Zone Statistical Server (ZSS)						
ZSS	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.3.5	PostgreSQL License (PostgreSQL)
ZSS	A7.16	Middleware - Application Library	ICU4C	http://icu-project.org	4.2.1	BSD 3-Clause License ("Modified" BSD)
ZSS	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	7.0.57	Apache License 2.0 (Apache-2.0)
ZSS	A7.16	Web Technologies	jersey	http://jersey.java.net/	1.18	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ZSS	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
ZSS	See Motorola Common SNMP Agent					
ZSS	See Motorola SNMP Agent (MotoAgent)					
ZSS	Motorola Common AAA API					
ZSS	See Motorola Common Password Vault					
ZSS	See Common Software Repository - PERL					
ZSS	See Common Red Hat Linux Platform (RHEL6.x)					
ZSS	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Zone Database Server (ZDS)						
ZDS	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.7	MIT License (MIT)
ZDS	A7.16	Middleware - Application Library	Guava	https://github.com/google/guava	18	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ZDS	A7.16	Connectivity - Networking Services	OpenDJ	http://opendj.forgerock.org	2.7.0	Common Development and Distribution License 1.0 (CDDL-1.0)
ZDS	A7.16	Database Technologies - Application	PostgreSQL LibPQ C Library	http://www.postgresql.org	9.3.5	PostgreSQL License (PostgreSQL)
ZDS	A7.16	Network Management Technologies	snmp4j	http://www.snmp4j.org/	2.3.1	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Network Management Technologies	SNMP++	http://www.agentpp.com/api/cpp/snmp_pp.html	3.2.10	MIT License (MIT)
ZDS	A7.16	Middleware - Application Library	Apache commons-lang	http://commons.apache.org/lang/index.html	3.1	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	Hawtbuf	http://fusesource.org/forge/projects/hawtbuf	1.9	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	Guice	http://code.google.com/p/google-guice/	3	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Connectivity - Networking Services	OpenLDAP SDK	http://www.openldap.org	2.4.39	BSD 4-Clause License ("Original" BSD)
ZDS	A7.16	Middleware - Application Library	Apache APR-util	http://apr.apache.org/	1.3.9	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	Apache APR	http://apr.apache.org/	1.3.9	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Connectivity - Networking Services	Apache commons-dbcp	http://commons.apache.org/dbcp/	1.4	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	activemq	http://activemq.apache.org/	5.10.0	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.5.4	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Middleware - Application Library	Apache commons-cli	http://commons.apache.org/proper/commons-cli/	1.2	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ZDS	A7.16	Data Analytics and Search	Apache commons-DBUtils	http://commons.apache.org/proper/commons-dbutils/	1.6	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Logging Services	logback	http://logback.qos.ch	1.1.2	Eclipse Public License 1.0 (EPL-1.0)
ZDS	A7.16	Connectivity - Networking Services	Novell NDK - LDAP Libraries for C	http://www.novell.com/developer/ndk/ldap_libraries_for_c.html	2010.10.30	Custom
ZDS	A7.16	Network Management Technologies	CMU SNMP	http://net-snmp.sourceforge.net	1990	Custom
ZDS	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
ZDS	A7.16	Engineering and Product Development Tools	ASM	http://asm.ow2.org/	3.1	BSD 3-Clause License ("Modified" BSD)
ZDS	A7.16	Middleware - Application Library	ICU	http://icu-project.org	4.2.1	BSD 3-Clause License ("Modified" BSD)
ZDS	See Motorola Common SNMP Agent					
ZDS	Motorola Common AAA API					
ZDS	See Motorola Common Password Vault					
ZDS	See Common Software Repository - PERL					
ZDS	See Common Red Hat Linux Platform (RHEL6.x)					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
ZDS	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
ZDS	See Motorola Common License Library (CLL)					
Provisioning Manager -- User Configuration Manager / Server (PM / UCM-UCS)						
UCS_PM	A7.16	Middleware - Application Library	Hawtbuf	http://fusesource.org/forge/projects/hawtbuf	1.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Guice	http://code.google.com/p/google-guice/	2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache APR	http://apr.apache.org/	1.4.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	EhCache	http://ehcache.org	2.8.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	ICU4J	http://icu-project.org	54.1.1	Custom
UCS_PM	A7.16	Middleware - Application Library	Apache Avalon	http://avalon.apache.org	4.1.3	Apache License 1.1 (Apache-1.1)
UCS_PM	A7.16	Middleware - Application Library	saxpath	http://www.saxpath.org/	1	Custom
UCS_PM	A7.16	Middleware - Application Library	asset-pipeline	https://github.com/bertramdev/asset-pipeline	1.9.6	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xpp3	http://www.extreme.indiana.edu/xgws/xsoap/xpp/mxp1/index.html	1.1.4c	Custom
UCS_PM	A7.16	Middleware - Application Library	xmlpull	http://www.xmlpull.org/	1.1.3.1	Public Domain

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	javax.activation	http://java.sun.com/products/javabeans/jaf/index.jsp	1.1	Common Development and Distribution License 1.1 (CDDL-1.1)
UCS_PM	A7.16	Middleware - Application Library	xmlbeans	http://xmlbeans.apache.org/	2.3.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xml-apis	http://xml.apache.org/commons/components/external	1.4.01	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xml-apis	http://xml.apache.org/commons/components/external	2.9.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache httpcomponents-httpclient	http://hc.apache.org/httpcomponents-client-ga/	4.3.5	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache httpcore	http://hc.apache.org	4.3.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xerces2-j/	2.11.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xbean-spring	http://geronimo.apache.org/xbean/	3.16	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	xalan-j	http://xml.apache.org/xalan-j/	2.7.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	xalan-j-serializer	http://xml.apache.org/xalan-j/	2.7.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	WSDL4J	http://sourceforge.net/projects/wsdl4j/	1.6.2	Common Public License 1.0 (CPL-1.0)
UCS_PM	A7.16	Middleware - Application Library	wstx-asl (woodstox)	http://woodstox.codehaus.org/	3.2.6	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	stax-api	http://stax.codehaus.org/	1.2.0	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	snakeyaml	https://code.google.com/p/snakeyaml/	1.6	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.5	MIT License (MIT)
UCS_PM	A7.16	Middleware - Application Library	rome	https://github.com/rometools/rome	1.0.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	jboss-saaj-api_spec	http://www.jboss.org	1.3	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	A7.16	Middleware - Application Library	Apache POI	http://poi.apache.org	3.9	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-ognl	https://commons.apache.org/proper/commons-ognl/	2.6.9	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	apache.servicemix.bundles.josql	http://mvnrepository.com/artifact/org.apache.servicemix.bundles/org.apache.servicemix.bundles.josql	1.5_5	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	jasypt	http://www.jasypt.org	1.9.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	javax.transaction.jta	http://java.sun.com/products/jta	1.1	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	A7.16	Web Technologies	javax.json	http://jsonp.java.net	1	Common Development and Distribution License 1.1 (CDDL-1.1)
UCS_PM	A7.16	Middleware - Application Library	jdom	http://www.jdom.org/	1	Custom
UCS_PM	A7.16	Middleware - Application Library	jettison	http://mvnrepository.com/artifact/org.codehaus.jettison/jettison	1.3.4	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	jsr250-api	http://jcp.org/aboutJava/communityprocess/final/jsr250/index.html	1	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	A7.16	Middleware - Application Library	jboss-jstl-api_spec	http://www.jboss.org	1.2, 1.1.2	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	A7.16	Middleware - Application Library	jboss-jaxws-api_spec	http://www.jboss.org	2.1	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	A7.16	Middleware - Application Library	geronimo	https://github.com/apache/geronimo-specs	1.1.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-validator	http://commons.apache.org/proper/commons-validator/	1.4.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.1.3	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-digester	http://commons.apache.org/proper/commons-digester/	1.8	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-digester	http://commons.apache.org/proper/commons-digester/	3.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-fileupload	https://commons.apache.org/proper/commons-fileupload/	1.3.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.9	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-compress	http://commons.apache.org/proper/commons-compress/	1.9	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-daemon	http://commons.apache.org/proper/commons-daemon	1.0.15	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-beanutils	http://commons.apache.org/proper/commons-beanutils/	1.8.3	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Engineering and Product Development Tools	apache-ant	http://ant.apache.org/	1.9.4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Engineering and Product Development Tools	aspectjrt	http://eclipse.org/aspectj	1.8.0	Eclipse Public License 1.0 (EPL-1.0)
UCS_PM	A7.16	Engineering and Product Development Tools	aspectjweaver	http://eclipse.org/aspectj	1.8.0	Eclipse Public License 1.0 (EPL-1.0)
UCS_PM	A7.16	Web Technologies	Apache Tomcat Web Server (embedded)	http://tomcat.apache.org/	7.0.57	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	transactions-essentials	https://github.com/atomikos/transactions-essentials	3.9.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	User Interface Technologies	graham_scan	https://github.com/brian3kb/graham_scan_js	1	MIT License (MIT)
UCS_PM	A7.16	User Interface Technologies	hammer.js	https://github.com/hammerjs/hammer.js	2	MIT License (MIT)
UCS_PM	A7.16	User Interface Technologies	leaflet-pip	https://github.com/mapbox/leaflet-pip	1	Public Domain
UCS_PM	A7.16	User Interface Technologies	g-leaflet-draw	https://github.com/mstahv/g-leaflet-draw	0.4.8	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	User Interface Technologies	Concavehull	https://github.com/Wildhoney/ConcaveHull	v0.1.5	MIT License (MIT)
UCS_PM	A7.16	Virtualization Technologies	g-leaflet	https://github.com/mstahv/g-leaflet	0.4.9	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-beanutils	http://commons.apache.org/proper/commons-beanutils/	1.9.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Engineering and Product Development Tools	apache-ant	http://ant.apache.org/	1.8.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Database Technologies - Application	PostgreSQL JDBC Driver	http://www.postgresql.org	9.3-1102	PostgreSQL License (PostgreSQL)
UCS_PM	A7.16	Middleware - Application Library	Javassist	http://www.javassist.org/	3.18.1-GA	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	4.0.4.RELEASE	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	3.2.8.RELEASE	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.6.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-cli	http://commons.apache.org/proper/commons-cli/	1.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	velocity	http://velocity.apache.org/index.html	1.7	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	xstream	https://github.com/codehaus/xstream	1.4.5	BSD 3-Clause License ("Modified" BSD)
UCS_PM	A7.16	Middleware - Application Library	xstream	https://github.com/codehaus/xstream	1.4.7	BSD 3-Clause License ("Modified" BSD)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-io	http://commons.apache.org/io	2.4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	3.3.2	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	cglib	https://github.com/cglib/cglib	3.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	2.6	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	JAXB	https://jaxb.dev.java.net/	2.2.9	Common Development and Distribution License 1.1 (CDDL-1.1)
UCS_PM	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
UCS_PM	A7.16	Middleware - Application Library	gson	https://code.google.com/p/google-gson/	2.2.4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	Jackson	http://jackson.codehaus.org/	1.9.13	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	Jackson	http://jackson.codehaus.org/	2.4.4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	activemq	http://activemq.apache.org	5.10.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Database Technologies - Embedded	hibernate	http://hibernate.org	4.3.7.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UCS_PM	A7.16	Connectivity - Protocol Stacks	Apache commons-net	http://commons.apache.org/net	3.3	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	activeio-core	http://activemq.apache.org/	3.1.4	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
UCS_PM	A7.16	User Interface Technologies	timo-jsclipper	https://github.com/evispa/timo-jsclipper	6.1.3.2	Boost License (BPL-1.0)
UCS_PM	A7.16	User Interface Technologies	d3js	http://d3js.org/	3.4.13	BSD 3-Clause License ("Modified" BSD)
UCS_PM	A7.16	Middleware - Application Library	Aopalliance	http://aopalliance.sourceforge.net/	1	Public Domain

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Engineering and Product Development Tools	groovy	http://groovy.codehaus.org/	2.3.6	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	jboss-logging	http://www.jboss.org/	3.1.3.GA	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	jandex	https://github.com/wildfly/jandex	1.1.0.Final	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Web Technologies	Google Web Toolkit (gwt)	http://www.gwtproject.org	2.7.0	Apache License 2.0 (Apache-2.0)
UCS_PM	A7.16	Middleware - Application Library	jboss-transaction-api_spec	http://www.jboss.org	1.0.0	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_PM	See Motorola Common SNMP Agent					
UCS_PM	Motorola Common AAA API					
UCS_PM	See Motorola Common Password Vault					
UCS_PM	See Common Software Repository - PERL					
UCS_PM	See Common Red Hat Linux Platform (RHEL6.x)					
UCS_PM	See Common Red Hat Linux Platform (RHEL6.x) - Optional					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_PM	See Motorola Common License Library (CLL)					
Provisioning Manager -- User Configuration Manager SLACAR Application						
UCS_SLACAR	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.4.3	MIT License (MIT)
UCS_SLACAR	A7.16	Middleware - Application Library	Javassist	http://www.javassist.org/	3.15.0-GA	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.14	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	javax.activation	http://java.sun.com/products/javabeans/jaf/index.jsp	1.1	Common Development and Distribution License 1.1 (CDDL-1.1)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	2.5	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	hamcrest (JavaHamcrest)	https://code.google.com/p/hamcrest/	1.3	BSD 3-Clause License ("Modified" BSD)
UCS_SLACAR	A7.16	Middleware - Application Library	xml-apis	http://xml.apache.org/commons/components/external	1.0.b2	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache httpcomponents-httpclient	http://hc.apache.org/httpcomponents-client-ga/	4.3.5	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache httpcore	http://hc.apache.org	4.3.2	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	stax-api	http://stax.codehaus.org/	1.0.2	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_SLACAR	A7.16	Database Technologies - Application	PostgreSQL JDBC Driver	http://www.postgresql.org	9.3-1100	PostgreSQL License (PostgreSQL)
UCS_SLACAR	A7.16	Middleware - Application Library	jboss-transaction-api_spec	http://www.jboss.org	1.0.1	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_SLACAR	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
UCS_SLACAR	A7.16	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.1.3	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache commons-io	http://commons.apache.org/io	1.2	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
UCS_SLACAR	A7.16	Middleware - Application Library	transactions-essentials	http://www.atomikos.com/Main/AtomikosCommunity	3.8.0	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	objenesis	https://code.google.com/p/objenesis/	1.2	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Engineering and Product Development Tools	junit	http://junit.org/	4.11	Eclipse Public License 1.0 (EPL-1.0)
UCS_SLACAR	A7.16	Engineering and Product Development Tools	Mockito	https://code.google.com/p/mockito/	1.9.5	MIT License (MIT)
UCS_SLACAR	A7.16	Engineering and Product Development Tools	powermock	https://github.com/jayway/powermock	1.5.1	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Aopalliance	http://aopalliance.sourceforge.net/	1	Public Domain

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_SLACAR	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	4.0.4.RELEASE	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Database Technologies - Embedded	hibernate	http://hibernate.org	4.2.6.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UCS_SLACAR	A7.16	Web Technologies	Jackson	http://jackson.codehaus.org/	1.9.13	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	JAXB	https://jaxb.dev.java.net/	2.2.3	Common Development and Distribution License 1.1 (CDDL-1.1)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache commons-exec	http://commons.apache.org/proper/commons-exec/	1.1	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.6	Apache License 2.0 (Apache-2.0)
UCS_SLACAR	A7.16	Web Technologies	jboss-logging	http://www.jboss.org/	3.1.0.GA	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
Provisioning Manager -- User Configuration Manager Audit Report Viewer Application						
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Javassist	http://www.javassist.org/	3.17.1-GA	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Web Technologies	javax.transaction.jta	http://java.sun.com/products/jta	1.1	Common Development and Distribution License 1.0 (CDDL-1.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	2.6	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	eclipse-ecj	http://www.eclipse.org/eclipse/	4.2.2	Eclipse Public License 1.0 (EPL-1.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	yuicompressor	https://yui.github.io/yuicompressor/	2.4.7	BSD 3-Clause License ("Modified" BSD)
UCS_Audit_Report_Viewer	A7.16	Web Technologies	xalan-j-serializer	http://xml.apache.org/xalan-j/	2.7.1	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Database Technologies - Application	PostgreSQL JDBC Driver	http://www.postgresql.org	9.3-1102	PostgreSQL License (PostgreSQL)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	groovy	http://groovy.codehaus.org/	2.3.6	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-validator	http://commons.apache.org/proper/commons-validator/	1.4.0	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-io	http://commons.apache.org/io	2.2	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	cglib	https://github.com/cglib/cglib	2.2	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	aspectjrt	http://eclipse.org/aspectj	1.8.1	Eclipse Public License 1.0 (EPL-1.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	aspectjweaver	http://eclipse.org/aspectj	1.8.1	Eclipse Public License 1.0 (EPL-1.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	jsr166y	http://g.oswego.edu/dl/concurrency-interest/	1.7.0	Creative Commons Public Domain Dedication
UCS_Audit_Report_Viewer	A7.16	Database Technologies - Embedded	Liquibase	http://liquibase.org	2.0.1	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Web Technologies	sitemesh	http://wiki.sitemesh.org/wiki/display/sitemesh/Home	2.4	Custom
UCS_Audit_Report_Viewer	A7.16	User Interface Technologies	jline2	http://jline.sourceforge.net/	2.12	BSD 3-Clause License ("Modified" BSD)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	objenesis	https://code.google.com/p/objenesis/	1.4	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	User Interface Technologies	jansi	https://github.com/fusesource/jansi	1.11	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	gant_groovy1.8	http://mvnrepository.com/artifact/org.codehaus.gant/gant_groovy1.8	1.9.6	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	Grails	http://grails.org	2.4.3	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	Grails-datastore	http://grails.org	3.1.2	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	gpars	http://gpars.codehaus.org	1.2.1	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	h2database	http://h2database.com/	1.3.176	Mozilla Public License Version 2.0 (MPL-2.0)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	ASM	http://asm.ow2.org/	3.1	BSD 3-Clause License ("Modified" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	ConcurrentLinkedHashMap	http://code.google.com/p/concurrentlinkedhashmap	1.4	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Aopalliance	http://aopalliance.sourceforge.net/	1	Public Domain
UCS_Audit_Report_Viewer	A7.16	Database Technologies - Embedded	hibernate	http://hibernate.org	3.6.10.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	4.0.6.RELEASE	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	EhCache	http://ehcache.org	2.6.9	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	gson	https://code.google.com/p/google-gson/	2.2.4	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.5	MIT License (MIT)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-fileupload	https://commons.apache.org/proper/commons-fileupload/	1.3.1	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.6	Apache License 2.0 (Apache-2.0)
UCS_Audit_Report_Viewer	A7.16	Engineering and Product Development Tools	apache-ant	http://ant.apache.org/	1.8.4	Apache License 2.0 (Apache-2.0)
Unified Event Manager (UEM)						
Common_UEM	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	Apache commons-exec	http://commons.apache.org/proper/commons-exec/	1.3	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_UEM	A7.16	Web Technologies	jQuery-Timepicker	http://trentrichardson.com/examples/timepicker/	1.3.2	MIT License (MIT)
Common_UEM	A7.16	Web Technologies	javax.json	http://jsonp.java.net	1	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Web Technologies	Underscore.js	http://underscorejs.org/	1.8.2	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	hamcrest (JavaHamcrest)	https://code.google.com/p/hamcrest/	1.3	BSD 3-Clause License ("Modified" BSD)
Common_UEM	A7.16	Web Technologies	Backbone.js	http://backbonejs.org/	1.1.2	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	JsViews	http://www.jsviews.com/#github	1.0.0-alpha	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	jettison	http://mvnrepository.com/artifact/org.codehaus.jettison/jettison	1.3.3	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Database Technologies - Application	javax.persistence	https://jcp.org/aboutJava/communityprocess/final/jsr317/index.html	1.0.2	Eclipse Public License 1.0 (EPL-1.0)
Common_UEM	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.1.0	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	hk2.osgi-resource-locator	https://java.net/projects/hk2	1.0.1	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Middleware - Application Library	hk2.external.asm-all-repackaged	https://java.net/projects/hk2	2.2.0-b21	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Middleware - Application Library	hk2.external.cglib	https://java.net/projects/hk2	2.2.0-b21	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_UEM	A7.16	Middleware - Application Library	JSON-P	https://json-processing-spec.java.net/	1	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.7	MIT License (MIT)
Common_UEM	A7.16	Web Technologies	Handlebars.js	http://handlebarsjs.com/	3.0.0	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	javax.ws.rs-api	https://jax-rs-spec.java.net/	2.0-rc3	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Connectivity - Networking Services	javax.websocket-api	https://java.net/projects/websocket-spec/	1	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Web Technologies	Flot	http://www.flotcharts.org/	0.8.2	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	javax.annotation-api	https://jcp.org/en/jsr/detail?id=250	1.2	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Web Technologies	jQuery-UI	http://jqueryui.com/	1.11.2	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	jbzip2	https://code.google.com/p/jbzip2/	0.9.1	MIT License (MIT)
Common_UEM	A7.16	Web Technologies	Grizzly	http://grizzly.java.net	2.3.7	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Middleware - Application Library	geojson-jackson	https://github.com/opendatalab-de/geojson-jackson	1.1	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	Tyrus	https://tyrus.java.net/	1.3	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_UEM	A7.16	Middleware - Application Library	Guava	https://github.com/google/guava	14.0.1	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	jersey	http://jersey.java.net/	2.5	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Middleware - Application Library	hk2.external.javax.inject	https://java.net/projects/hk2	2.2.0-b21	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	7.0.59	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	3.3.2	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	osgi	http://mvnrepository.com/artifact/org.osgi/org.osgi.core	4.2.0	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	json2	https://github.com/douglascrockford/JSON-js	2	Public Domain
Common_UEM	A7.16	Web Technologies	Jackson	http://jackson.codehaus.org/	2.5.3	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	Apache commons-beanutils	http://commons.apache.org/proper/commons-beanutils/	1.8.3	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
Common_UEM	A7.16	Middleware - Application Library	SLF4J	http://www.slf4j.org	1.7.7	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	classmate	http://github.com/cowtowncoder/java-classmate	1.0.0	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	hibernate-validator	http://hibernate.org/validator/	5.1.3.FINAL	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_UEM	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Network Management Technologies	jsmiparser	http://www.jsmiparser.org	0.13	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Middleware - Application Library	javax.el-api	http://download.java.net/maven/2/javax/el/el-api/2.2.1-b04/	2.2.4	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	GIS/Mapping	Leaflet	http://www.leafletjs.org	0.7.2	BSD 2-Clause License ("Simplified" BSD)
Common_UEM	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.3.5	PostgreSQL License (PostgreSQL)
Common_UEM	A7.16	Middleware - Application Library	hk2.api	https://hk2.java.net	2.2.0-b21	Common Development and Distribution License 1.1 (CDDL-1.1)
Common_UEM	A7.16	Web Technologies	jboss-logging	http://www.jboss.org/	3.1.3.GA	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	jQuery	http://jquery.com/	2.1.1	MIT License (MIT)
Common_UEM	A7.16	Data Compression	UnZip (Info-Zip)	http://www.info-zip.org/	6	Custom
Common_UEM	A7.16	Data Compression	Zip (Info-Zip)	http://www.info-zip.org/	3	Custom
Common_UEM	A7.16	Middleware - Application Library	Apache Jakarta Oro	http://jakarta.apache.org/oro/	2.0.8	Apache License 1.1 (Apache-1.1)
Common_UEM	A7.16	Middleware - Application Library	Castor	http://castor.codehaus.org	1.2	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Connectivity - Networking Services	JavaMail	http://kenai.com/projects/javamail	1.4.2	Common Development and Distribution License 1.0 (CDDL-1.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Common_UEM	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xerces-j	2.7.1	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	Spring Framework	http://www.springsource.org	3.2.8.RELEASE	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Virtualization Technologies	VMware Virtual Infrastructure (vSphere) Java API	http://vijava.sourceforge.net/	5.0.1	BSD 3-Clause License ("Modified" BSD)
Common_UEM	A7.16	Web Technologies	Freemarker	http://freemarker.sourceforge.net/	2.3.19	BSD 4-Clause License ("Original" BSD)
Common_UEM	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
Common_UEM	A7.16	Database Technologies - Application	PostgreSQL JDBC Driver	http://www.postgresql.org	9.3-1101 JDBC 41	PostgreSQL License (PostgreSQL)
Common_UEM	A7.16	Web Technologies	hoverIntent	http://cherne.net/brian/resources/jquery.hoverIntent.html	r7	MIT License (MIT)
Common_UEM	A7.16	Web Technologies	DataTables.js	http://www.datatables.net/	1.9.4	BSD 3-Clause License ("Modified" BSD)
Common_UEM	A7.16	Web Technologies	jqModal	http://jquery.iceburg.net/jqModal/	r14	MIT License (MIT)
Common_UEM	A7.16	Web Technologies	Apache commons-codec	http://commons.apache.org/proper/commons-codec/	1.7	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	xalan-j	http://xml.apache.org/xalan-j	2.7.0	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.1.1	Apache License 2.0 (Apache-2.0)
Common_UEM	A7.16	Web Technologies	jsTree	http://www.jstree.com/	1.0 fix 2	MIT License (MIT)
Common_UEM	A7.16	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.6.0	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.1.1	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	Apache commons-beanutils	http://commons.apache.org/proper/commons-beanutils/	1.8.3	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Web Technologies	hibernate-validator	http://hibernate.org/validator/	5.1.3.FINAL	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	javax.el-api	http://download.java.net/maven/2/javax/el/el-api/2.2.1-b04/	2.2.4	Common Development and Distribution License 1.1 (CDDL-1.1)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	classmate	http://github.com/cowtowncoder/java-classmate	1.0.0	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Network Management Technologies	jsmiparser	http://www.jsmiparser.org	0.13	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	SLF4J	http://www.slf4j.org	1.7.7	MIT License (MIT)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
Element_Management_Toolkit	ELEMENT_MGT_R1.0	Web Technologies	jboss-logging	http://www.jboss.org/	3.1.3.GA	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UEM	See Motorola Common SNMP Agent					
UEM	Motorola Common AAA API					
UEM	See Motorola Common Password Vault					
UEM	See Common Software Repository - PERL					
UEM	See Common Red Hat Linux Platform (RHEL6.x)					
UEM	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
UEM	See Motorola Common License Library (CLL)					
Unified Network Configurator (UNC)						
UNC	A7.16	Middleware - Application Library	Jackson-core	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Jackson-databind	http://wiki.fasterxml.com/JacksonHome	2.4.3	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Jackson-annotations	http://wiki.fasterxml.com/JacksonHome	2.4.0	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNC	A7.16	Middleware - Application Library	org.javassist:javassist:	http://www.javassist.org/	3.17.1-GA	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	asset-pipeline	https://github.com/bertramdev/asset-pipeline	1.9.9	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	xbean-spring	http://geronimo.apache.org/xbean/	4.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Apache commons-ognl	https://commons.apache.org/proper/commons-ognl/	2.6.11	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	jasypt	http://www.jasypt.org	1.9.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	org.grails.plugins:hibernate4	http://grails.org/plugin/hibernate4	4.3.5.5	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org	1.1.0.Final	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	geronimo-jms_1.1_spec	http://geronimo.apache.org/	1.1.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Apache commons-io	http://commons.apache.org/io/	2.2	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	grails-ant	http://grails.org/plugin/grails-ant	0.1.3	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	jsr166y	http://gee.cs.oswego.edu/dl/concurrency-interest	1.7.0	Creative Commons Public Domain Dedication
UNC	A7.16	Database Technologies - Embedded	Liquibase	http://liquibase.org	2.0.5	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	sitemesh	http://wiki.sitemesh.org/wiki/display/sitemesh/Home	2.4	Custom
UNC	A7.16	Engineering and Product Development Tools	Grails	http://grails.org	2.4.4	Apache License 2.0 (Apache-2.0)

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UNC	A7.16	Database Technologies - Embedded	h2database	http://www.h2database.com	1.3.176	Mozilla Public License Version 2.0 (MPL-2.0)
UNC	A7.16	Middleware - Application Library	ConcurrentLinkedHashMap	http://code.google.com/p/concurrentlinkedhashmap	1.4	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	gpars	http://gpars.codehaus.org	1.2.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	classmate	https://github.com/cowtowncoder/java-classmate	1.0.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	aspectjweaver	https://eclipse.org/aspectj/	1.8.2	Eclipse Public License 1.0 (EPL-1.0)
UNC	A7.16	Security - Applications/Services	grails-spring-security-core	http://grails-plugins.github.io/grails-spring-security-core/	2.0-RC4	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Security - Applications/Services	spring-security-core	http://spring.io/spring-security	3.2.3.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Apache commons-validator	http://commons.apache.org/validator/	1.4.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Hawtbuf	http://fusesource.com	1.9	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	aspectjrt	https://eclipse.org/aspectj/	1.8.2	Eclipse Public License 1.0 (EPL-1.0)
UNC	A7.16	Middleware - Application Library	geronimo-j2ee-management_1.1_spec	http://geronimo.apache.org/	1.0.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	spring-orm	https://github.com/spring-projects/spring-framework	4.0.7.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	spring-binding	https://github.com/SpringSource/spring-webflow	2.4.1.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	spring-js-resources	https://github.com/SpringSource/spring-webflow	2.4.1.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	User Interface Technologies	Leaflet.contextmenu	https://github.com/aratcliffe/Leaflet.contextmenu	1.0.0	MIT License (MIT)
UNC	A7.16	Web Technologies	spring-webflow	https://github.com/SpringSource/spring-webflow	2.4.1.RELEASE	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNC	A7.16	Web Technologies	spring-js	https://github.com/SpringSource/spring-webflow	2.4.1.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	SockJS Client	http://sockjs.org	0.3.4	MIT License (MIT)
UNC	A7.16	Web Technologies	grails-webflow-plugin	https://github.com/grails-plugins/grails-webflow-plugin	2.1.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	STOMP.js	https://github.com/jmesnil/stomp-websocket	2.3.4	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	hawtdispatch	http://fusesource.com	1.11	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	hawtdispatch-transport	http://fusesource.com	1.11	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	grails-spring-websocket	https://github.com/zyro23/grails-spring-websocket	1.2.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Database Technologies - Embedded	grails-database-migration	https://github.com/grails-plugins/grails-database-migration	1.4.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	grails-cache	http://grails-plugins.github.com/grails-cache/	1.1.8	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	grails-webxml	https://github.com/burtbeckwith/grails-webxml	1.4.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	mqtt-client	http://fusesource.com	1.3	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	grails-svn	http://grails.org/plugin/svn	1.0.0.M1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	hibernate-validator	http://validator.hibernate.org	5.0.3.FINAL	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	hibernate-ehcache	http://ehcache.org	4.3.5.FINAL	Apache License 2.0 (Apache-2.0)
UNC	A7.16	GIS/Mapping	Leaflet.FreeDraw	https://github.com/Wildhoney/Leaflet.FreeDraw	1.1.6	MIT License (MIT)
UNC	A7.16	Web Technologies	grails-datastore-rest-client	https://github.com/grails-plugins/grails-rest-client-builder/	2.0.3	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNC	A7.16	GIS/Mapping	Leaflet	http://www.leafletjs.org	0.7.3	BSD 2-Clause License ("Simplified" BSD)
UNC	A7.16	User Interface Technologies	Leaflet.MousePosition	https://github.com/ardhi/Leaflet.MousePosition	30-Nov-12	MIT License (MIT)
UNC	A7.16	Security - Cryptography	Zebedee	http://www.winton.org.uk/zebedee/	2.4.1	GNU General Public License Version 2.0 or Later (GPL-2.0+)
UNC	A7.16	Middleware - Application Library	gson	https://code.google.com/p/google-gson/	2.2.4	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xerces2-j/	2.11.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.5	MIT License (MIT)
UNC	A7.16	Web Technologies	xalan-j	http://xml.apache.org/xalan-j/	2.7.2	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	7.0.59	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	jQuery-BlockUI	http://malsup.com/jquery/block/	2.31	MIT License (MIT)
UNC	A7.16	Middleware - Application Library	Spring Framework	http://projects.spring.io/spring-framework/	4.0.7.RELEASE	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	Jackson	http://jackson.codehaus.org/	1.9.13	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	activemq	http://activemq.apache.org	5.7.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	activemq-kahadb	http://activemq.apache.org/	5.7.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	activemq-protobuf	http://activemq.apache.org/	1.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
UNC	A7.16	Middleware - Application Library	Apache commons-lang	https://commons.apache.org/proper/commons-lang/	2.6	Apache License 2.0 (Apache-2.0)

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UNC	A7.16	Database Technologies - Embedded	hibernate	http://hibernate.org	4.3.5.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UNC	A7.16	Connectivity - Protocol Stacks	Apache commons-net	http://commons.apache.org/net	3.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Engineering and Product Development Tools	Rhino	https://developer.mozilla.org/en-US/docs/Mozilla/Projects/Rhino	1.7R4	Mozilla Public License Version 2.0 (MPL-2.0)
UNC	A7.16	Middleware - Application Library	activeio-core	http://activemq.apache.org/	3.1.4	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain
UNC	A7.16	User Interface Technologies	d3js	http://d3js.org/	3.4.13	BSD 3-Clause License ("Modified" BSD)
UNC	A7.16	User Interface Technologies	timo-jsclipper	https://github.com/evispa/timo-jsclipper	6.1.3.2	Boost License (BPL-1.0)
UNC	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Aopalliance	http://aopalliance.sourceforge.net/	1	Public Domain
UNC	A7.16	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.6	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	Apache commons-fileupload	https://commons.apache.org/proper/commons-fileupload/	1.3.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	EhCache	http://ehcache.org	2.4.8	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNC	A7.16	Engineering and Product Development Tools	groovy	http://groovy.codehaus.org/	2.4.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Engineering and Product Development Tools	apache-ant	http://ant.apache.org/	1.7.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	jandex	https://github.com/wildfly/jandex	1.1.0.Final	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	jboss-logging	http://www.jboss.org/	3.1.0.GA	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UNC	A7.16	Middleware - Application Library	grails-jms	https://grails.org/plugin/jms	1.3	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	grails-scaffolding	http://grails.org/plugin/scaffolding	2.1.2	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Middleware - Application Library	jboss-transaction-api_spec	http://www.jboss.org	1.0.0	Common Development and Distribution License 1.0 (CDDL-1.0)
UNC	A7.16	Web Technologies	Google Web Toolkit (gwt)	http://www.gwtproject.org	2.7.0	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Web Technologies	jQuery	http://jquery.com/	1.7.2	MIT License (MIT)
UNC	A7.16	Web Technologies	jQuery	http://jquery.com/	2.1.1	MIT License (MIT)
UNC	A7.16	Web Technologies	jQuery	http://jquery.com/	1.11.1	MIT License (MIT)
UNC	A7.16	Web Technologies	grails-jquery	http://grails.org/plugin/jquery	1.11.1	Apache License 2.0 (Apache-2.0)
UNC	A7.16	Database Technologies - Application	PostgreSQL	http://www.postgresql.org	9.0.7	PostgreSQL License (PostgreSQL)
UNC	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	6.0.39	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNC	A7.16	Middleware - Application Library	Apache commons-digester	http://commons.apache.org/proper/commons-digester/	1.7	Apache License 2.0 (Apache-2.0)
UNC	See Motorola Common SNMP Agent					
UNC	Motorola Common AAA API					
UNC	See Motorola Common Password Vault					
UNC	See Common Software Repository - PERL					
UNC	See Common Red Hat Linux Platform (RHEL6.x)					
UNC	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Unified Network Configurator Device Server (UNCDS)						
UNCDS	A7.16	Middleware - Application Library	xerces-j	http://xerces.apache.org/xerces2-j/	2.11.0	Apache License 2.0 (Apache-2.0)
UNCDS	A7.16	Web Technologies	xalan-j	http://xml.apache.org/xalan-j/	2.7.2	Apache License 2.0 (Apache-2.0)
UNCDS	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	7.0.59	Apache License 2.0 (Apache-2.0)
UNCDS	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
UNCDS	A7.16	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	6.0.39	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNCDS	A7.16	Middleware - Application Library	Apache commons-digester	http://commons.apache.org/proper/commons-digester/	1.7	Apache License 2.0 (Apache-2.0)
UNCDS	See Motorola Common SNMP Agent					
UNCDS	Motorola Common AAA API					
UNCDS	See Motorola Common Password Vault					
UNCDS	See Common Software Repository - PERL					
UNCDS	See Common Red Hat Linux Platform (RHEL6.x)					
UNCDS	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
Configuration Manager (CM) - K and Express Systems Only						
Configuration Manager (CM)	A7.16	Web Application Framework / Services	Apache Tomcat	http://tomcat.Apache.org/	6.0.18	Apache 2.0
Configuration Manager (CM)	A7.16	Logging utility	Log4j	http://logging.Apache.org/log4j/docs/index.html	1.2.17	Apache 2.0
Configuration Manager (CM)	A7.16	SNMP protocol library	SNMP4J	https://www.snmp4j.org	1.11	Apache 2.0
Configuration Manager (CM)	A7.16	Database	PostgreSQL	http://www.postresql.org	9.3.3	BSD Type
Configuration Manager (CM)	A7.16	Messaging Services	ActiveMQ	http://activemq.apache.org	5.4.2	Apache 2.0 + Other OSS Licenses

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Configuration Manager (CM)	A7.16	Messaging Services	ActiveMQ-CPP	http://activemq.apache.org	3.1.3	Apache 2.0 + Other OSS Licenses
Configuration Manager (CM)	A7.16	Messaging Services Platform Library	Apache Apr	http://apr.apache.org	1.3.6	Apache 2.0 + Other OSS Licenses
Configuration Manager (CM)	A7.16	Messaging Services Platform Library	Apache Apr-Iconv	http://apr.apache.org	1.3.8	Apache 2.0 + Other OSS Licenses
Configuration Manager (CM)	A7.16	Messaging Services Platform Library	Apache Apr-Util	http://apr.apache.org	1.3.9	Apache 2.0 + Other OSS Licenses
Configuration Manager (CM)	A7.16	Java Script Toolkit	Groovy	http://www.dojotoolkit.org	1.7.8	Apache 2.0
Configuration Manager (CM)	A7.16	Web Toolkit	Google Web Toolkit	http://www.gwtproject.org/?csw=1	2.5.1	Creative Commons Attribution 3.0
Configuration Manager (CM)	A7.16	Directory Services	OpenDJ	http://forgerock.com/products/open-identity-stack/opendj/	2.6.0	CDDLv1 + Other OSS Licenses
Configuration Manager (CM)	A7.16	Daemon API	procrun	http://commons.apache.org/proper/commons-daemon/procrun.html	1.0.15	Apache 2.0
Configuration Manager (CM)	A7.16	library	google-guice	https://code.google.com/p/google-guice/	2	Apache 2.0
Configuration Manager (CM)	A7.16	library	AOP Alliance	http://aopalliance.sourceforge.net/	1.0	Public Domain
Configuration Manager (CM)	A7.16	library	Simple Logging Facade for Java	http://www.slf4j.org/	1.7.5	MIT License
Configuration Manager (CM)	A7.16	library	guava-libraries	https://code.google.com/p/guava-libraries/	13.0.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	Logback	http://logback.qos.ch/	1.0.9	EPL v1.0 LGPL 2.1
Configuration Manager (CM)	A7.16	library	commons-cli	http://commons.apache.org/proper/commons-cli/	1.2	Apache 2.0
Configuration Manager (CM)	A7.16	library	commons-dbcp	http://commons.apache.org/proper/commons-dbcp/	1.4	Apache 2.0
Configuration Manager (CM)	A7.16	library	commons-lang	http://commons.apache.org/proper/commons-lang/	3.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	commons-pool	http://commons.apache.org/proper/commons-pool/	1.5.4	Apache 2.0

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Configuration Manager (CM)	A7.16	library	activemq-client	https://activemq.apache.org/activemq-580-release.html	5.8.0	Apache 2.0
Configuration Manager (CM)	A7.16	library	hawtbuf	http://hawtbuf.fusesource.org/	1.9	Apache 2.0
Configuration Manager (CM)	A7.16	library	aspectjrt	http://www.eclipse.org/aspectj/	1.7.4	Mozilla 1.1
Configuration Manager (CM)	A7.16	library	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD Type
Configuration Manager (CM)	A7.16	Software Framework	Spring	http://spring.io/	4.0.0	Apache 2.0
Configuration Manager (CM)	A7.16	library	xml-apis		1.4.01	Apache 2.0
Configuration Manager (CM)	A7.16	library	json		20090211	MIT Type
Configuration Manager (CM)	A7.16	library	xstream	http://xstream.codehaus.org/	1.4.5	BSD Type
Configuration Manager (CM)	A7.16	library	xpp3_min	http://www.extreme.indiana.edu/xgws/xsoap/xpp/	1.1.4c	Indiana University Extreme! Lab Software License, Version 1.1.1
Configuration Manager (CM)	A7.16	library	Jettison	http://jettison.codehaus.org/License	1.3.4	Apache 2.0
Configuration Manager (CM)	A7.16	library	StAX	http://stax.codehaus.org/	1.2.0	Apache 2.0
Configuration Manager (CM)	A7.16	library	Gson	https://code.google.com/p/google-gson/	2.2.4	Apache 2.0
Configuration Manager (CM)	A7.16	library	Apache Commons	http://commons.apache.org/		Apache 2.0
Configuration Manager (CM)	A7.16	library	hibernate	http://www.hibernate.org/	4.3.4	LGPL 2.1
Configuration Manager (CM)	A7.16	library	EhCache	http://ehcache.org/	2.8.0	Apache 2.0
Configuration Manager (CM)	A7.16	The JBoss Logging Framework	jboss-logging	http://www.jboss.org	3.1.3 GA	Apache 2.0
Configuration Manager (CM)	A7.16	library	Jboss Transaction API 1.2	http://fisheye.jboss.org/browse/JBossAS/projects/specs/tags/jboss-transaction-api_1.1_spec-1.0.0.Final	1.0.0 Final	CDDL
Configuration Manager (CM)	A7.16	Java Annotation Indexer	Jandex	https://github.com/wildfly/jandex	1.1.0 Final	Apache 2.0
Configuration Manager (CM)	A7.16	ANother Tool for Language Recognition	antlr	http://www.antlr.org/	2.7.7	BSD Type

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Configuration Manager (CM)	A7.16	Library	JBoss.org - Javassist	http://www.csg.ci.i.u-tokyo.ac.jp/~chiba/javassist/	3.18.1-GA	Mozilla Public License 1.1
Configuration Manager (CM)	A7.16	Library	Atomikos TransactionsEssentials	http://www.atomikos.com/Main/TransactionsEssentials	3.9.2	Apache 2.0
Configuration Manager (CM)	A7.16	Library	Code Generation Library (cglib)	http://sourceforge.net/projects/cglib/files/cglib3/	3.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	geronimo-jms_1.1_spec	https://geronimo.apache.org/	1.1.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	geronimo-j2ee-management_1.1_spec	https://geronimo.apache.org/	1.0.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	org.osgi.core	http://mvnrepository.com/artifact/org.osgi/org.osgi.core/4.3.1	4.3.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	jasypt	http://www.jasypt.org/	1.9.1	Apache 2.0
Configuration Manager (CM)	A7.16	library	icu4j	http://icu-project.org/apiref/icu4j/	52.1	ICU License (BSD like)
Configuration Manager (CM)	A7.16	Library	Apache POI	http://poi.apache.org/	3.9	Apache 2.0
Configuration Manager (CM)	A7.16	Library	XMLBeans	http://xmlbeans.apache.org/	2.3.0	Apache 2.0
Configuration Manager (CM)	See Motorola Common Password Vault					
Configuration Manager (CM)	See Windows Supplemental CD					
Network Management Client Applications Software						
NM_Client	A7.16	Database Technologies - Application	PostgreSQL ODBC Driver (psqlODBC)	http://www.postgresql.org	09.03.0400	GNU Library General Public License v2 or Later (LGPL-2.0+)
NM_Client	A7.16	Middleware - Application Library	Java7 JCE	http://www.oracle.com	1.7.0_67	Custom
NM_Client	A7.16	Security - Applications/Services	libssh2	http://www.libssh2.org	1.4.3	BSD 3-Clause License ("Modified" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
NM_Client	A7.16	Middleware - Application Library	JNA	https://github.com/twall/jna	3.2.7	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
NM_Client	A7.16	Middleware - Application Library	Java CSV	http://sourceforge.net/projects/javacsv	2.1	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
NM_Client	A7.16	Middleware - Application Library	SwingX	https://swingx.java.net	1.6.4	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
NM_Client	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
NM_Client	A7.16	Network Management Technologies	AdventNet SNMP Components	http://www.net-snmp.org	4.0.0	Custom
NM_Client	A7.16	Database Technologies - Application	PostgreSQL JDBC Driver	http://jdbc.postgresql.org	9.2-1000	PostgreSQL License (PostgreSQL)
NM_Client	A7.16	Middleware - Application Library	xerces-C++	http://xerces.apache.org/xerces-c	3.1.1	Apache License 2.0 (Apache-2.0)
NM_Client	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
NM_Client	A7.16	Network Management Technologies	snmp4j	http://www.snmp4j.org/	2.1.0	Apache License 2.0 (Apache-2.0)
NM_Client	A7.16	Middleware - Application Library	ICU4C	http://icu-project.org	4.4.1	BSD 3-Clause License ("Modified" BSD)
NM_Client	A7.16	Network Management Technologies	jsmiparser	http://www.jsmiparser.org	0.5	Apache License 2.0 (Apache-2.0)
NM_Client	A7.16	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.7	Public Domain

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
NM_Client	A7.16	Security - Applications/Services	JSch	http://www.jcraft.com/jsch	0.1.43	BSD 2-Clause License ("Simplified" BSD)
NM_Client	A7.16	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
NM_Client	See Motorola Common Password Vault					
NM_Client	See Windows Supplemental CD					
NM_Client	See Motorola Common License Library (CLL)					
NM_Client	See Motorola Common AAA API					
NM_Client	See Configuration Service Software (CSS)					
NM_Client	See Software Download Manager (SWDL)					
NM_Client	See SDM3000 Builder					
Configuration Service Software (CSS)						
CSS	A7.16	Middleware - Application Library	JNA	https://github.com/twall/jna	4.1.0	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CSS	A7.16	Security - Applications/Services	JSch	http://www.jcraft.com/jsch	0.1.51	BSD 2-Clause License ("Simplified" BSD)
CSS	A7.16	Connectivity - Networking Services	dnsjava	http://www.dnsjava.org	2.1.5	BSD 2-Clause License ("Simplified" BSD)
CSS	A7.16	Security - Cryptography	BouncyCastle - Java	http://www.bouncycastle.org/	1.5	MIT License (MIT)
CSS	A7.16	Middleware - Application Library	EclipseLink MOXy	http://www.eclipse.org/eclipselink/moxy.php	2.5.2	Eclipse Public License 1.0 (EPL-1.0)
CSS	A7.16	Engineering and Product Development Tools	OpenJDK - Windows	http://openjdk.java.net	1.8 u20	GNU General Public License Version 2.0 or Later (GPL-2.0+) + CLASSPATH Exception
CSS	A7.16	Installation Software	WiX Toolset	http://wixtoolset.org/	3.7.1224.0	Microsoft Reciprocal License (MS-RL)
CSS	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
CSS	A7.16	Installation Software	NSIS	http://nsis.sourceforge.net	2.46	Custom
CSS	A7.16	Installation Software	NSIS Application ID Plugin	http://nsis.sourceforge.net/ApplicationID_plug-in	V1.0	Custom
CSS	A7.16	Data Compression	jzlib	http://www.jcraft.com/jzlib	1.1.0	BSD 2-Clause License ("Simplified" BSD)
CSS	A7.16	Connectivity - Protocol Stacks	RXTX	http://users.frii.com/jarvi/rxtx/index.html	2.1-7r2	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
Software Download Manager (SWDL)						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PC SWDL	A7.16	Connectivity - Networking Services	dnsjava	http://www.dnsjava.org	2.1.5	BSD 2-Clause License ("Simplified" BSD)
PC SWDL	A7.16	Middleware - Application Library	jCUP	http://www2.cs.tum.edu/projects/cup/	11b	Custom
PC SWDL	A7.16	Engineering and Product Development Tools	jflex	http://jflex.de	1.6.0	Custom
PC SWDL	A7.16	Engineering and Product Development Tools	JNA	https://github.com/twall/jna	4.1.0	Apache License 2.0 (Apache-2.0)
PC SWDL	A7.16	Security - Cryptography	BouncyCastle - Java	http://www.bouncycastle.org/	1.5	MIT License (MIT)
PC SWDL	A7.16	Middleware - Application Library	guava	https://github.com/google/guava	14.0.1	Apache License 2.0 (Apache-2.0)
PC SWDL	A7.16	Security - Applications/Services	Apache MINA SSHD	http://mina.apache.org/sshd	0.14.0	Apache License 2.0 (Apache-2.0)
PC SWDL	A7.16	Connectivity - Protocol Stacks	Apache MINA	http://mina.apache.org/mina-project/	2.0.7	Apache License 2.0 (Apache-2.0)
PC SWDL	A7.16	Middleware - Application Library	EclipseLink MOXy	http://www.eclipse.org/eclipselink/moxy.php	2.5.2	Eclipse Public License 1.0 (EPL-1.0)
PC SWDL	A7.16	Middleware - Application Library	Motorola Common Cygwin	http://www.cygwin.com	Motorola_Common_CYGWIN_04.05.00 (cygwin 1.7.33-1)	GNU General Public License Version 3.0 or Later (GPL-3.0+)
PC SWDL	A7.16	Engineering and Product Development Tools	OpenJDK - Windows	http://openjdk.java.net	1.8 u20	GNU General Public License Version 2.0 or Later (GPL-2.0+) + CLASSPATH Exception
PC SWDL	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.17	Apache License 2.0 (Apache-2.0)
PC SWDL	A7.16	Installation Software	WiX Toolset	http://wixtoolset.org/	3.7.1224.0	Microsoft Reciprocal License (MS-RL)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PC SWDL	A7.16	Middleware - Application Library	Apache commons-cli	http://commons.apache.org/proper/commons-cli/	1.2	Apache License 2.0 (Apache-2.0)
3600 Gateways (SmartX)						
SmartX	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
SmartX	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
SmartX	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
SmartX	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
SmartX	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
SmartX	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
SmartX	See Motorola Common SNMP Agent					
GCM 8000 Comparator Products						
GCM8000	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GCM8000	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GCM8000	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GCM8000	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
GCM8000	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GCM8000	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GCM8000	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GCM8000	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
GCM8000	See Motorola Common SNMP Agent					
GTR 8000 Station/Radio Products						
GTR8000	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GTR8000	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GTR8000	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
GTR8000	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
GTR8000	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GTR8000	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GTR8000	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GTR8000	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
GTR8000	See Motorola Common SNMP Agent					
GTR 3600 Station/Radio Products						
GTR3600	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GTR3600	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GTR3600	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
GTR3600	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
GTR3600	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GTR3600	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GTR3600	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GTR3600	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
GTR3600	See Motorola Common SNMP Agent					
GPW 8000 Receiver Products						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GPW8000	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GPW8000	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GPW8000	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
GPW8000	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
GPW8000	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GPW8000	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GPW8000	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GPW8000	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
GPW8000	See Motorola Common SNMP Agent					
GCP 8000 Site Controller Products						
GCP8000	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GCP8000	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GCP8000	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
GCP8000	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GCP8000	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GCP8000	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GCP8000	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GCP8000	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
GCP8000	See Motorola Common SNMP Agent					
GPB 8000 Reference Distribution Module Product						
GPB8000	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
GPB8000	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.57.0	Boost License (BPL-1.0)
GPB8000	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
GPB8000	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
GPB8000	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
GPB8000	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GPB8000	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
GPB8000	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GPB8000	See Motorola Common SNMP Agent					
MLC8000 Configuration Tool (CT)						
MLC8000_CT	A7.16	User Interface Technologies	CProgressBar	http://www.codeproject.com/KB/miscctrl/progressbar.aspx	1.4	Code Project Open License Version 1.02 (CPOL-1.02)
MLC8000_CT	A7.16	Security - Applications/Services	PuTTY	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	0.6	MIT License (MIT)
MLC8000_CT	A7.16	User Interface Technologies	CMNCTRL1 Samples	http://msdn.microsoft.com/en-us/library/ftzc04bf(VS.80).aspx	n/a	CodeGuru License
MLC8000_CT	A7.16	User Interface Technologies	CustomizedReportListCtrl	http://www.codeproject.com/KB/list/CustomizedReportListCtrl.aspx	Dec-03	Code Project Open License Version 1.02 (CPOL-1.02)
MLC8000_CT	A7.16	User Interface Technologies	DrawingBitmapTransparently	http://www.codeguru.com/cpp/g-m/bitmap/specialeffects/article.php/c1749	5-Aug-98	CodeGuru License
MLC8000_CT	A7.16	User Interface Technologies	YABFFW	http://www.codeguru.com/cpp/w-p/files/browserfunctionsdialogs/article.php/c4443	18-Aug-03	CodeGuru License
MLC8000_CT	A7.16	User Interface Technologies	MultiLineListCtrl	http://www.codeproject.com/Articles/20007/Expandable-List-Control-to-Accept-Multilines	14-Aug-07	Freeware
MLC8000_CT	A7.16	User Interface Technologies	XListCtrl	http://www.codeproject.com/KB/list/xlistctrl.aspx	1.3	Code Project Open License Version 1.02 (CPOL-1.02)
MLC8000_CT	A7.16	User Interface Technologies	SortTextItems	http://www.codeguru.com/cpp/controls/listview/sorting/article.php/c969	16-Aug-98	CodeGuru License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MLC8000_CT	A7.16	User Interface Technologies	ControlPos	http://www.codeguru.com/cpp/w-d/dislog/resizabledialogs/article.php/c1947	1.01	CodeGuru License
MLC8000_CT	A7.16	User Interface Technologies	MFC Grid Control	http://www.codeproject.com/Articles/8/MFC-Grid-control-2-27	2.27	Custom
MLC8000_CT	A7.16	User Interface Technologies	SplashWnd	http://www.codeproject.com/kb/dialog/dialogspl.aspx	1	Freeware
MLC8000_CT	A7.16	User Interface Technologies	CTreeCtrlMultiColumn	http://www.codeguru.com/cpp/controls/treeview/misc-advanced/article.php/c671	19-Oct-98	CodeGuru License
MLC8000_CT	A7.16	User Interface Technologies	XFloorWnd	http://www.codeguru.com/Cpp/COM-Tech/activex/controls/article.php/c2653	21-Dec-98	CodeGuru License
MLC8000_CT	A7.16	Security - Cryptography	AES-256	http://www.literatecode.com/	5-May-09	BSD 2-Clause License ("Simplified" BSD)
MLC8000_CT	A7.16	User Interface Technologies	GetFolder	http://www.codeguru.com/cpp/w-p/files/browserfunctionsdialogs/article.php/c4465/index.html	13-Feb-01	CodeGuru License
MLC8000_CT	See Windows Supplemental CD					
MLC8000 Gateway Unit (GU)						
MLC8000_GU	A7.16	Connectivity - Protocol Stacks	NETBSD - TELNET Definitions	http://cvsweb.netbsd.org/bsdweb.cgi/src/include/arpa/telnet.h?rev=1.11&content-type=text/x-cvsweb-markup	n/a	BSD 3-Clause License ("Modified" BSD)
MLC8000_GU	A7.16	Security - Cryptography	RSA MD5 Message-Digest Algorithm	http://www.ietf.org	n/a	Custom
MLC8000_GU	A7.16	Data Compression	zlib	http://www.zlib.net/	1.1.3	zlib/libpng License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MLC8000 Dispatch Application						
MLC8000_DA	A7.16	GUI controls library	AvalonControlsLibrary	http://avaloncontrolslib.codeplex.com/	2	Microsoft Public License (MsPL)
MLC8000_DA	A7.17	GUI controls library	Chronos WPF	http://chronoswpf.codeplex.com/	v1.0 RC 2	MIT
MLC8000_DA	A7.18	GUI controls library	Implementing an Observable Dictionary	http://drwpf.com/blog/2007/09/16/can-i-bind-my-itemscontrol-to-a-dictionary/	n/a	BSD Type License
MLC8000_DA	A7.19	GUI controls library	WPF GridView Column Width Calculator	http://www.leghumped.com/blog/2009/03/11/wpf-gridview-column-width-calculator	n/a	Public Domain
MLC8000_DA	A7.20	GUI controls library	WPFDeveloperTools	http://wpfdevelopertools.codeplex.com	n/a	Microsoft Public License (MsPL)
MLC8000_DA	See Windows Supplemental CD					
S2500 Gateway						
S2500 Gateway	A7.16	Secure Communications	OpenSSH	http://www.openssh.org	4.5.1	BSD Type
S2500 Gateway	A7.16	Secure Communications / Encryption	OpenSSL	http://www.openssl.org	0.9.8b	BSD Type
S2500 Gateway	A7.16	Random Number Function	random	none	N/A	BSD Type
S2500 Gateway	A7.16	CRC Algorithm	CRC	none	N/A	Public Domain
S2500 Gateway	A7.16	Lightweight Directory Services Framework	LDAP	University of Michigan	3.3	BSD Type
S2500 Gateway	A7.16	Protocol Support	l2tpd	none	N/A	BSD Type

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
S2500 Gateway	A7.16	Encrytion	md5	none	N/A	Public Domain / Freeware
S2500 Gateway	A7.16	Protocol Support	pqh	none	N/A	BSD Type
S2500 Gateway	A7.16	Regular Expression Library	regexp	none	1.3	BSD/MIT Type
S2500 Gateway	A7.16	Protocol Support	rsvp	none	N/A	BSD/MIT Type
S2500 Gateway	A7.16	String Utilities	snprintf	none	N/A	MIT
S2500 Gateway	A7.16	Hash Algorithm	superfasthash	none	N/A	BSD Type
S2500 Gateway	A7.16	data transfer protocol	Zmodem Protocol	http://www.omen.com	N/A	Public Domain
S2500 Gateway	A7.16	time functions	ctime	none	N/A	Public Domain
S2500 Gateway	A7.16	IKE Services	racoon2	http://www.racoon2.wide.ad.jp/w/	20100526a	BSD Type License
S2500 Gateway	See Motorola Common SNMP Agent					
S6000 Gateway						
S6000 Gateway	A7.16	Secure Communications	OpenSSH	http://www.openssh.org	6.7p1	BSD Type
S6000 Gateway	A7.16	Secure Communications / Encryption	OpenSSL	http://www.openssl.org	1.0.1c / FIPS-2.0.1	BSD Type
S6000 Gateway	A7.16	String Utilities	snprintf	none	N/A	MIT
S6000 Gateway	A7.16	Hash Algorithm	superfasthash	none	N/A	BSD Type
S6000 Gateway	A7.16	data transfer protocol	Zmodem Protocol	http://www.omen.com	N/A	Public Domain
S6000 Gateway	A7.16	time functions	ctime	none	N/A	Public Domain
S6000 Gateway	A7.16	IKE Services	racoon2	http://www.racoon2.wide.ad.jp/w/	20100526a	BSD Type License
S6000 Gateway	A7.16	CRC Algorithm	CRC	none	N/A	Public Domain

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
S6000 Gateway	A7.16	Lightweight Directory Services Framework	LDAP	University of Michigan	3.3	BSD Type
S6000 Gateway	A7.16	Regular Expression Library	regexp	none	1.3	BSD/MIT Type
S6000 Gateway	See Motorola Common SNMP Agent					
GGM8000 Gateway						
GGM8000 Gateway	A7.16	Secure Communications	OpenSSH	http://www.openssh.org	6.7p1	BSD Type
GGM8000 Gateway	A7.16	Secure Communications / Encryption	OpenSSL	http://www.openssl.org	1.0.1c / FIPS-2.0.1	BSD Type
GGM8000 Gateway	A7.16	String Utilities	snprintf	none	N/A	MIT
GGM8000 Gateway	A7.16	Hash Algorithm	superfasthash	none	N/A	BSD Type
GGM8000 Gateway	A7.16	data transfer protocol	Zmodem Protocol	http://www.omen.com	N/A	Public Domain
GGM8000 Gateway	A7.16	time functions	ctime	none	N/A	Public Domain
GGM8000 Gateway	A7.16	IKE Services	racoon2	http://www.racoon2.wide.ad.jp/w/	20100526a	BSD Type License
GGM8000 Gateway	A7.16	CRC Algorithm	CRC	none	N/A	Public Domain
GGM8000 Gateway	A7.16	Lightweight Directory Services Framework	LDAP	University of Michigan	3.3	BSD Type
GGM8000 Gateway	A7.16	Regular Expression Library	regexp	none	1.3	BSD/MIT Type

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GGM8000 Gateway	See Motorola Common SNMP Agent					
Telephony Media Gateway (TMG)						
TMG	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
TMG	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License
TMG	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
TMG	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
TMG	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
TMG	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
TMG	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
TMG	See Motorola Common SNMP Agent					
Voice Processing Module (VPM)						
VPM	A7.16	Operating System	ENEA OSE	http://www.enea.com	5.5.3	Commercial + OSS Licenses
VPM	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8n	OpenSSL License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
VPM	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.1.4	Custom
VPM	A7.16	Data Compression	libbzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
VPM	A7.16	Data Compression	bzip2	http://www.bzip.org	1.0.6	BSD 4-Clause License ("Original" BSD)
VPM	A7.16	Middleware - Application Library	OpenBSD Buffer Management	http://www.openbsd.org	n/a	BSD 3-Clause License ("Modified" BSD)
VPM	A7.16	Middleware - Application Library	POSIX.2 CRC	http://www.netlib.org/crc/crc.c	1	BSD 4-Clause License ("Original" BSD)
VPM	See Motorola Common SNMP Agent					
Fixed Data Products: Alerting Master Computer (AMC)						
AMC	A7.16	OS utilities	setacl	http://setacl.sourceforge.net/	2.2.0.0	GPLv2
AMC	A7.16	Library	Ndde	http://ndde.codeplex.com	v2.01.0563	Shared Source License for Ndde
AMC	A7.16	Library	WASP	http://wasp.codeplex.com	1.8149	Microsoft Reciprocol License (Ms-RL)
AMC	A7.16	.NET Framework	.NET Framework	http://www.microsoft.com/NET	3.5, 4.0	Microsoft .NET Framework Redistribution License
AMC	See Windows Supplemental CD					
Fixed Data Products: Graphical Master Computer (GMC)						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
GMC	A7.16	OS utilities	setacl	http://setacl.sourceforge.net/	2.2.0.0	GPLv2
GMC	A7.16	Library	Ndde	http://ndde.codeplex.com	v2.01.0563	Shared Source License for Ndde
GMC	A7.16	Library	WASP	http://wasp.codeplex.com	1.8149	Microsoft Reciprocol License (Ms-RL)
GMC	A7.16	.NET Framework	.NET Framework	http://www.microsoft.com/NET	3.5, 4.0	Microsoft .NET Framework Redistribution License
GMC	See Windows Supplemental CD					
Fixed Data Products: SDM3000 Builder						
SDM3000 Builder	A7.16	IP Address GUI control	Ariad IP Address Control	http://www.freevbcode.com/ShowCode.Asp?ID=368	1.2.0.19	Freeware
SDM3000 Builder	A7.16	Balloon GUI control	Balloon.Net	http://www.codeproject.com/cs/miscctrl/balloonnet.asp	1.0.1885.37343	CPOL 1.02
SDM3000 Builder	A7.16	Timezone database	Olson TZ database	http://www.twinsun.com/tz/tz-link.htm	2013i code, 2013i data	Public Domain
SDM3000 Builder	A7.16	ZIP compression and archivation library	Info-Zip	http://www.info-zip.org/	Zip 2.32, UnZip 5.52	BSD Type
SDM3000 Builder	See Windows Supplemental CD					
Fixed Data Products: SDM3000 RTU						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
SDM3000 RTU	A7.16	Embedded Linux OS	WindRiver Linux	http://www.windriver.com	4.0 Update 3	Commercial + OSS Licenses
SDM3000 RTU	A7.16	Timezone database	Olson TZ database	http://www.twinsun.com/tz/tz-link.htm	2013i code, 2013i data	Public Domain
SDM3000 RTU	A7.16	XML free/open source library	Arabica	http://www.jezuk.co.uk/arabica	2004-Feb and 2012-November	BSD Type
SDM3000 RTU	A7.16	OS utilities	Audit	http://people.redhat.com/sgrubb/audit	2.3.1	GPLv2
SDM3000 RTU	A7.16	web server CGI	CGICC	http://www.gnu.org/software/cgicc/	3.2.2	GPLv2
SDM3000 RTU	A7.16	DHCP Daemon	DHCPD	http://www.isc.org/index.pl?/sw/dhcp /	3.0.5	ISC License (BSD Type)
SDM3000 RTU	A7.16	Process control daemon	doinkd	http://linux.softpedia.com/get/System/Monitoring/doinkd-12649.shtml	0.01	GPLv2
SDM3000 RTU	A7.16	XML free/open source library	Expat	http://expat.sourceforge.net/	1.95.7	MIT
SDM3000 RTU	A7.16	web server	HTTPD	http://httpd.Apache.org /	2.2.22	Apache 2.0 + Other OSS Licenses
SDM3000 RTU	A7.16	Security library	Linux-PAM	http://www.kernel.org/pub/linux/libs/pam/	1.1.16	BSD, GPL
SDM3000 RTU	A7.16	module for Apache httpd	mod_evasive	http://www.zdziarski.com/projects/mod_evasive/	1.10.1	GPLv2
SDM3000 RTU	A7.16	module for Apache httpd	modsecurity	http://www.modsecurity.org/	2.7.2	GPLv2
SDM3000 RTU	A7.16	FTP Deamon	wu-ftpd	http://www.wu-ftpd.org /	2.6.2	WU-FTP License
SDM3000 RTU	A7.16	Encryption / Network utiltities/libraries	openssh	http://www.openssh.com/	5.5p1	BSD Type
SDM3000 RTU	A7.16	Encryption / Network utiltities/libraries	openssl	http://www.openssl.org/	1.0.0e	Dual BSD Type
SDM3000 RTU	A7.16	Library	PStreams	http://pstreams.sourceforge.net/	0.5.2	LGPLv2.1
SDM3000 RTU	A7.16	OS utilities	sudo	http://www.sudo.ws/	1.8.1p2	BSD Type
SDM3000 RTU	A7.16	Network utiltities	tcpdump	http://www.tcpdump.org/	3.9.5	BSD Type

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
SDM3000 RTU	A7.16	Boot Loader	U-Boot	http://www.denx.de/wiki/Uboot	1.1.1	GPLv2
SDM3000 RTU	A7.16	compression library	zlib	http://www.zlib.net/	1.2.5	BSD/MIT
SDM3000 RTU	A7.16	Authentication Services	PAM Radius	http://freeradius.org/pam_radius_aut	1.3.17	GPLv2
SDM3000 RTU	A7.16	Network utiltities	PPP	http://ppp.samba.org/index.html	2.4.5	BSD + GPLv2 + Public Domain
SDM3000 RTU	A7.16	Utilities	libxml2	http://xmlsoft.org/index.html	2.7.8	MIT
SDM3000 RTU	A7.16	library providing ping support	libping	http://directory.fsf.org/project/libping/	1.15	GPLv2
SDM3000 RTU	See Motorola Common SNMP Agent					
Fixed Data Products: SDM3000 Network Translator						
SDM3000 Network Translator	A7.16	Embedded Linux OS	WindRiver Linux	http://www.windriver.com	4.0 Update 3	Commercial + OSS Licenses
SDM3000 Network Translator	A7.16	Timezone database	Olson TZ database	http://www.twinsun.com/tz/tz-link.htm	2013i code, 2013i data	Public Domain
SDM3000 Network Translator	A7.16	XML free/open source library	Arabica	http://www.jezuk.co.uk/arabica	2004-Feb and 2012-November	BSD Type
SDM3000 Network Translator	A7.16	OS utilities	Audit	http://people.redhat.com/sgrubb/audit	2.3.1	GPLv2
SDM3000 Network Translator	A7.16	web server CGI	CGICC	http://www.gnu.org/software/cgicc/	3.2.2	GPLv2
SDM3000 Network Translator	A7.16	DHCP Daemon	DHCPD	http://www.isc.org/index.pl?/sw/dhcp /	3.0.5	ISC License (BSD Type)
SDM3000 Network Translator	A7.16	Process control daemon	doinkd	http://linux.softpedia.com/get/System/Monitoring/doinkd-12649.shtml	0.01	GPLv2
SDM3000 Network Translator	A7.16	XML free/open source library	Expat	http://expat.sourceforge.net/	1.95.7	MIT
SDM3000 Network Translator	A7.16	web server	HTTPD	http://httpd.Apache.org /	2.2.22	Apache 2.0 + Other OSS Licenses

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
SDM3000 Network Translator	A7.16	Security library	Linux-PAM	http://www.kernel.org/pub/linux/libs/pam/	1.1.16	BSD, GPL
SDM3000 Network Translator	A7.16	module for Apache httpd	mod_evasive	http://www.zdziarski.com/projects/mod_evasive/	1.10.1	GPLv2
SDM3000 Network Translator	A7.16	module for Apache httpd	modsecurity	http://www.modsecurity.org/	2.7.2	GPLv2
SDM3000 Network Translator	A7.16	FTP Deamon	wu-ftpd	http://www.wu-ftpd.org /	2.6.2	WU-FTP License
SDM3000 Network Translator	A7.16	Encryption / Network utiltities/libraries	openssh	http://www.openssh.com/	5.5p1	BSD Type
SDM3000 Network Translator	A7.16	Encryption / Network utiltities/libraries	openssl	http://www.openssl.org/	1.0.0e	Dual BSD Type
SDM3000 Network Translator	A7.16	Library	PStreams	http://pstreams.sourceforge.net/	0.5.2	LGPLv2.1
SDM3000 Network Translator	A7.16	OS utilities	sudo	http://www.sudo.ws/	1.8.1p2	BSD Type
SDM3000 Network Translator	A7.16	Network utiltities	tcpdump	http://www.tcpdump.org/	3.9.5	BSD Type
SDM3000 Network Translator	A7.16	Boot Loader	U-Boot	http://www.denx.de/wiki/Uboot	1.1.1	GPLv2
SDM3000 Network Translator	A7.16	compression library	zlib	http://www.zlib.net/	1.2.5	BSD/MIT
SDM3000 Network Translator	A7.16	Authentication Services	PAM Radius	http://freeradius.org/pam_radius_aut	1.3.17	GPLv2
SDM3000 Network Translator	A7.16	Network utiltities	PPP	http://ppp.samba.org/index.html	2.4.5	BSD + GPLv2 + Public Domain
SDM3000 Network Translator	A7.16	Utilities	libxml2	http://xmlsoft.org/index.html	2.7.8	MIT
SDM3000 Network Translator	A7.16	library providing ping support	libping	http://directory.fsf.org/project/libping/	1.15	GPLv2
SDM3000 Network Translator	See Motorola Common SNMP Agent					
Fixed Data Products: MCC 7500 Aux I/O Server						
MCC 7500 Aux I/O Server	A7.16	Embedded Linux OS	WindRiver Linux	http://www.windriver.com	4.0 Update 3	Commercial + OSS Licenses

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC 7500 Aux I/O Server	A7.16	Timezone database	Olson TZ database	http://www.twinsun.com/tz/tz-link.htm	2013i code, 2013i data	Public Domain
MCC 7500 Aux I/O Server	A7.16	XML free/open source library	Arabica	http://www.jezuk.co.uk/arabica	2004-Feb and 2012-November	BSD Type
MCC 7500 Aux I/O Server	A7.16	OS utilities	Audit	http://people.redhat.com/sgrubb/audit	2.3.1	GPLv2
MCC 7500 Aux I/O Server	A7.16	web server CGI	CGICC	http://www.gnu.org/software/cgicc/	3.2.2	GPLv2
MCC 7500 Aux I/O Server	A7.16	DHCP Daemon	DHCPD	http://www.isc.org/index.pl?/sw/dhcp /	3.0.5	ISC License (BSD Type)
MCC 7500 Aux I/O Server	A7.16	Process control daemon	doinkd	http://linux.softpedia.com/get/System/Monitoring/doinkd-12649.shtml	0.01	GPLv2
MCC 7500 Aux I/O Server	A7.16	XML free/open source library	Expat	http://expat.sourceforge.net/	1.95.7	MIT
MCC 7500 Aux I/O Server	A7.16	web server	HTTPD	http://httpd.Apache.org /	2.2.22	Apache 2.0 + Other OSS Licenses
MCC 7500 Aux I/O Server	A7.16	Security library	Linux-PAM	http://www.kernel.org/pub/linux/libs/pam/	1.1.16	BSD, GPL
MCC 7500 Aux I/O Server	A7.16	module for Apache httpd	mod_evasive	http://www.zdziarski.com/projects/mod_evasive/	1.10.1	GPLv2
MCC 7500 Aux I/O Server	A7.16	module for Apache httpd	modsecurity	http://www.modsecurity.org/	2.7.2	GPLv2
MCC 7500 Aux I/O Server	A7.16	FTP Deamon	wu-ftpd	http://www.wu-ftpd.org /	2.6.2	WU-FTP License
MCC 7500 Aux I/O Server	A7.16	Encryption / Network utiltities/libraries	openssh	http://www.openssh.com/	5.5p1	BSD Type
MCC 7500 Aux I/O Server	A7.16	Encryption / Network utiltities/libraries	openssl	http://www.openssl.org/	1.0.0e	Dual BSD Type
MCC 7500 Aux I/O Server	A7.16	Library	PStreams	http://pstreams.sourceforge.net/	0.5.2	LGPLv2.1
MCC 7500 Aux I/O Server	A7.16	OS utilities	sudo	http://www.sudo.ws/	1.8.1p2	BSD Type
MCC 7500 Aux I/O Server	A7.16	Network utiltities	tcpdump	http://www.tcpdump.org/	3.9.5	BSD Type
MCC 7500 Aux I/O Server	A7.16	Boot Loader	U-Boot	http://www.denx.de/wiki/Uboot	1.1.1	GPLv2

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC 7500 Aux I/O Server	A7.16	compression library	zlib	http://www.zlib.net/	1.2.5	BSD/MIT
MCC 7500 Aux I/O Server	A7.16	Authentication Services	PAM Radius	http://freeradius.org/pam_radius_aut	1.3.17	GPLv2
MCC 7500 Aux I/O Server	A7.16	Network utiltities	PPP	http://ppp.samba.org/index.html	2.4.5	BSD + GPLv2 + Public Domain
MCC 7500 Aux I/O Server	A7.16	Utilities	libxml2	http://xmlsoft.org/index.html	2.7.8	MIT
MCC 7500 Aux I/O Server	A7.16	library providing ping support	libping	http://directory.fsf.org/project/libping/	1.15	GPLv2
MCC 7500 Aux I/O Server	See Motorola Common SNMP Agent					
ACE 3600 Products						
ACE3600 Firmware	A7.16	SNMP Manager	CMU SNMP	ftp://ftp.andrew.cmu.edu/pub/net/snmp/cmu-snmp-V1.14.tar.gz	1.14	BSD Type
ACE3600 Firmware	A7.16	Time Management	ntp	http://www.ntp.org	4.2.0a	BSD Type
ACE3600 Firmware	A7.16	ZIP compression and archivation library	Zlib	http://www.zlib.net/	1.2.3	BSD Type
ACE3600 Firmware	A7.16	ZIP compression and archivation library	Zlib	Provided as part of RTBF software vendor's SMA component. http://www.zlib.net/	1.1.3	BSD Type
ACE3600 System Tools Suite	A7.16	ZIP compression and archivation library	Info-Zip	http://www.info-zip.org/	Zip 2.32, UnZip 5.52	BSD Type
ASTRO25 Console Products: MCC7500 Console						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC7500_Console	A7.16	Middleware - Application Library	ReSIProcate	http://www.resiprocate.org	1.7.0	Custom
MCC7500_Console	A7.16	Middleware - Application Library	Apache APR-iconv	http://apr.apache.org/	1.3.8	Apache License 2.0 (Apache-2.0)
MCC7500_Console	A7.16	Middleware - Application Library	Apache APR-util	http://apr.apache.org/	1.3.9	Apache License 2.0 (Apache-2.0)
MCC7500_Console	A7.16	Connectivity - Networking Services	ActiveMQ-CPP	http://activemq.apache.org/cms/index.html	3.1.3	Apache License 2.0 (Apache-2.0)
MCC7500_Console	A7.16	Middleware - Application Library	Apache APR	http://apr.apache.org/	1.3.6	Apache License 2.0 (Apache-2.0)
MCC7500_Console	A7.16	Security - Applications/Services	libssh2	http://www.libssh2.org	1.2	BSD 3-Clause License ("Modified" BSD)
MCC7500_Console	A7.16	Installation Software	NSIS	http://nsis.sourceforge.net	2.46	Custom
MCC7500_Console	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1i	OpenSSL License
MCC7500_Console	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.4.1	Custom
MCC7500_Console	A7.16	Middleware - Application Library	TAO	http://www.cs.wustl.edu/~schmidt/ACE.htm	1.4.1	Custom
MCC7500_Console	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.21	Custom
MCC7500_Console	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.55.0	Boost License (BPL-1.0)
MCC7500_Console	See Motorola Common Password Vault					
MCC7500_Console	See Motorola Common AAA API					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC7500_Console	See Motorola Common SNMP Agent					
MCC7500_Console	See Windows Supplemental CD					
ASTRO25 Console Products: MCC7100 Console						
MCC7100_Console	A7.16	Middleware - Application Library	Apache APR-iconv	http://apr.apache.org/	1.3.8	Apache License 2.0 (Apache-2.0)
MCC7100_Console	A7.16	Audio Processing	Sun G.711 Codec	http://gnuradio.org/redmine/projects/gnuradio/repository/revisions/877683e50587cc208d2869efa0273351784dcb76/entry/gr-vocoder/lib/g7xx/g711.c	n/a	Custom
MCC7100_Console	A7.16	Audio Processing	G.728 LD-CELP Codec	ftp://svr-ftp.eng.cam.ac.uk/pub/comp.speech/coding/ldcelp-2.0.tar.gz	2	Custom
MCC7100_Console	A7.16	Middleware - Application Library	ReSIProcate	http://www.resiprocate.org	1.7.0	Custom
MCC7100_Console	A7.16	Audio Processing	SoundTouch	http://www.surina.net/soundtouch	1.7.0	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
MCC7100_Console	A7.16	Middleware - Application Library	Apache APR-util	http://apr.apache.org/	1.3.9	Apache License 2.0 (Apache-2.0)
MCC7100_Console	A7.16	Connectivity - Networking Services	ActiveMQ-CPP	http://activemq.apache.org/cms/index.html	3.1.3	Apache License 2.0 (Apache-2.0)
MCC7100_Console	A7.16	Middleware - Application Library	Apache APR	http://apr.apache.org/	1.3.6	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC7100_Console	A7.16	Audio Processing	NAudio	http://naudio.codeplex.com/releases/view/96875	1.6	Microsoft Public License (MS-PL)
MCC7100_Console	A7.16	Installation Software	NSIS	http://nsis.sourceforge.net	2.46	Custom
MCC7100_Console	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1i	OpenSSL License
MCC7100_Console	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.4.1	Custom
MCC7100_Console	A7.16	Middleware - Application Library	TAO	http://www.cs.wustl.edu/~schmidt/ACE.htm	1.4.1	Custom
MCC7100_Console	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.21	Custom
MCC7100_Console	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.55.0	Boost License (BPL-1.0)
MCC7100_Console	See Motorola Common Password Vault					
MCC7100_Console	See Motorola Common AAA API					
MCC7100_Console	See Motorola Common SNMP Agent					
MCC7100_Console	See Windows Supplemental CD					
ASTRO25 Console Products: PRX7000_Console_Proxy						
PRX7000_Console_Proxy	A7.16	Installation Software	NSIS	http://nsis.sourceforge.net	2.46	Custom
PRX7000_Console_Proxy	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1i	OpenSSL License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PRX7000_Console_Proxy	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.4.1	Custom
PRX7000_Console_Proxy	A7.16	Middleware - Application Library	TAO	http://www.cs.wustl.edu/~schmidt/ACE.htm	1.4.1	Custom
PRX7000_Console_Proxy	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.21	Custom
PRX7000_Console_Proxy	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.55.0	Boost License (BPL-1.0)
PRX7000_Console_Proxy	See Motorola Common Password Vault					
PRX7000_Console_Proxy	See Motorola Common AAA API					
PRX7000_Console_Proxy	See Motorola Common SNMP Agent					
PRX7000_Console_Proxy	See Windows Supplemental CD					
ASTRO25 Console Products: MCC 5500						
MCC 5500	A7.16	Data Base	FireBird	http://www.firebirdsql.org/	2.1.3	Initial Developer's Public License + Interbase Public License + Other OSS Licenses
MCC 5500	A7.16	Data Base Connector	IBPP - C++ API for Firebird RDBMS	http://www.ibpp.org/	2.5.3.1	IBPP License (MIT Type License)
MCC 5500	A7.16	C++ Utilities Library	boost	http://www.boost.org/	1.37.0	Boost License (BSD/MIT Type)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCC 5500	See Windows Supplemental CD					
Transcoder						
Transcoder	A7.16	Middleware - Application Library	Apache APR-iconv	http://apr.apache.org/	1.3.8	Apache License 2.0 (Apache-2.0)
Transcoder	A7.16	Audio Processing	Sun G.711 Codec	http://gnuradio.org/redmine/projects/gnuradio/repository/revisions/877683e50587cc208d2869efa0273351784dcb76/entry/gr-vocoder/lib/g7xx/g711.c	n/a	Custom
Transcoder	A7.16	Audio Processing	G.728 LD-CELP Codec	ftp://svr-ftp.eng.cam.ac.uk/pub/comp.speech/coding/ldcelp-2.0.tar.gz	2	Custom
Transcoder	A7.16	Middleware - Application Library	ReSIProcate	http://www.resiprocate.org	1.7.0	Custom
Transcoder	A7.16	Audio Processing	SoundTouch	http://www.surina.net/soundtouch	1.7.0	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
Transcoder	A7.16	Middleware - Application Library	Apache APR-util	http://apr.apache.org/	1.3.9	Apache License 2.0 (Apache-2.0)
Transcoder	A7.16	Connectivity - Networking Services	ActiveMQ-CPP	http://activemq.apache.org/cms/index.html	3.1.3	Apache License 2.0 (Apache-2.0)
Transcoder	A7.16	Middleware - Application Library	Apache APR	http://apr.apache.org/	1.3.6	Apache License 2.0 (Apache-2.0)
Transcoder	A7.16	Audio Processing	NAudio	http://naudio.codeplex.com/releases/view/96875	1.6	Microsoft Public License (MS-PL)
Transcoder	A7.16	Installation Software	NSIS	http://nsis.sourceforge.net	2.46	Custom

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
Transcoder	A7.16	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1i	OpenSSL License
Transcoder	A7.16	Middleware - Application Library	ACE	http://www.cs.wustl.edu/~schmidt/ACE.htm	5.4.1	Custom
Transcoder	A7.16	Middleware - Application Library	TAO	http://www.cs.wustl.edu/~schmidt/ACE.htm	1.4.1	Custom
Transcoder	A7.16	Data Compression	7-Zip	http://www.7-zip.org	9.21	Custom
Transcoder	A7.16	Middleware - Application Library	Boost	http://www.boost.org/	1.55.0	Boost License (BPL-1.0)
Transcoder	See Motorola Common Password Vault					
Transcoder	See Motorola Common AAA API					
Transcoder	See Motorola Common SNMP Agent					
Transcoder	See Windows Supplemental CD					
Console Alias Management Server (CAM)						
CAM	A7.16	Logging Services	SLF4J	http://www.slf4j.org/	1.7.10	MIT License (MIT)
CAM	A7.16	Middleware - Application Library	EhCache	http://ehcache.org	2.9.0	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Middleware - Application Library	eclipse-ecj	http://www.eclipse.org/eclipse/	4.4	Eclipse Public License 1.0 (EPL-1.0)
CAM	A7.16	Web Technologies	Apache Tomcat Web Server (embedded)	http://tomcat.apache.org/	7.0.59	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CAM	A7.16	Database Technologies - Application	HyperSQL	http://hsqldb.org	2.3.2	BSD 4-Clause License ("Original" BSD)
CAM	A7.16	Web Technologies	Apache Tomcat Native Library	http://tomcat.apache.org/native-doc/	1.1.32	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Web Technologies	Apache Tomcat Extras	http://tomcat.apache.org/	7.0.59	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Database Technologies - Application	Liquibase	http://www.liquibase.org/index.html	3.3.2	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Web Technologies	Apache Wicket	http://wicket.apache.org	6.19.0	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Web Technologies	jersey	http://jersey.java.net/	1.19	Common Development and Distribution License 1.1 (CDDL-1.1)
CAM	A7.16	Middleware - Application Library	activemq	http://activemq.apache.org/	5.11.1	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.1	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Middleware - Application Library	cglib	http://cglib.sourceforge.net/	2.2	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Web Technologies	javax.transaction.jta	http://java.sun.com/products/jta	1.1	Common Development and Distribution License 1.0 (CDDL-1.0)
CAM	A7.16	Middleware - Application Library	Javassist	http://www.javassist.org/	3.12.0.GA	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Middleware - Application Library	Apache commons-daemon	http://commons.apache.org/proper/commons-daemon	1.0.15	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Logging Services	log4cplus	http://sourceforge.net/projects/log4cplus	1.0.4	Apache License 1.1 (Apache-1.1)
CAM	A7.16	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CAM	A7.16	Database Technologies - Application	Liquibase-slf4j	https://github.com/mattbertolini/liquibase-slf4j	1.0.0	MIT License (MIT)
CAM	A7.16	Logging Services	log4j	http://logging.apache.org/log4j	1.2.16	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Security - Applications/Services	SPNEGO	http://spnego.sourceforge.net	r7	GNU Lesser General Public License v3 or Later (LGPL-3.0+)
CAM	A7.16	Middleware - Application Library	Hawtbuf	http://fusesource.org/forge/projects/hawtbuf	1.9	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Engineering and Product Development Tools	ASM	http://asm.ow2.org/	3.1	BSD 3-Clause License ("Modified" BSD)
CAM	A7.16	Middleware - Application Library	geronimo	https://github.com/apache/geronimo-specs	1.1.1	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Middleware - Application Library	c3p0	http://www.mchange.com/projects/c3p0/index.html	0.9.1	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
CAM	A7.16	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.6.0	Apache License 2.0 (Apache-2.0)
CAM	A7.16	Database Technologies - Embedded	hibernate	http://hibernate.org	3.6.9.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
CAM	See Motorola Common Password Vault					
CAM	See Motorola Common AAA API					

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
CAM	See Motorola Common SNMP Agent					
CAM	See Windows Supplemental CD					
Astro Radio Products: XTS/XTL Radio Product Family						
XTS/XTL Radio Product Family	A7.16	C Run-Time library	avr-libc	http://www.nongnu.org/avr-libc	1.0.4	BSD Type
XTS/XTL Radio Product Family	A7.16	Unicode Libraries	ICU	http://www.icu-project.org	2.8	BSD Type
XTS/XTL Radio Product Family	A7.16	Encryption	MD4	http://tools.ietf.org/html/rfc1320 , http://tools.ietf.org/html/rfc1321	n/a	RSA License (BSD Type)
XTS/XTL Radio Product Family	A7.16	Encryption	MD5 Message-Digest Algorithms	http://tools.ietf.org/html/rfc1320 , http://tools.ietf.org/html/rfc1321	n/a	RSA License (BSD Type)
XTS/XTL Radio Product Family	A7.16	implements the Microsoft Challenge-Handshake	MSCHAP	http://tools.ietf.org/html/rfc2433	n/a	ISC License (Modified BSD-Type)
Astro Radio Products: XTS/XTL CPS						
XTS/XTL CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.02	BSD Type
XTS/XTL CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.03 Beta	BSD Type
XTS/XTL CPS	A7.16	FlashPlayer	Adobe Flash Player	http://www.adobe.com/	n/a	Adobe Distribution License + End User License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
XTS/XTL CPS	A7.16	Reports Libraries	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	N/A	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008 LICENSE AGREEMENT - DISTRIBUTION
XTS/XTL CPS	A7.16	Standard Template Library	Standard Template Library	ftp://butler.hpl.hp.com/stl http://www.acm.org/crossroads/xrds2-3/ovp.html	N/A	BSD Type
XTS/XTL CPS	A7.16	Windows Registry Utilities	Windows Registry Utilities	http://www.codeguru.com	N/A	Freeware
XTS/XTL CPS	A7.16	Windows Key Handling	Windows Key Handling Utilities	http://www.codeguru.com	N/A	Freeware
XTS/XTL CPS	A7.16	Encryption	THE BLOWFISH ENCRYPTION ALGORITHM	http://www.schneier.com/blowfish-download.html	19960625	Public Domain
XTS/XTL CPS	A7.16	GUI Utilities	Macintosh-like Slider Control (Windows Programming)	http://www.codeguru.com	N/A	Freeware
XTS/XTL CPS	A7.16	GUI Utilities	MFC Grid Control	http://www.codeguru.com	N/A	Freeware
XTS/XTL CPS	A7.16	GUI Utilities	Edit Controls	http://www.codeguru.com	N/A	Freeware
XTS/XTL CPS	See Windows Supplemental CD					

Astro Radio Products: APX Radio Product Family

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
APX Radio Product Family	A7.16	Unicode Libraries	ICU	http://www.icu-project.org	2.8	BSD Type
APX Radio Product Family	A7.16	Unicode Libraries	ICU4C	http://www.icu-project.org	4.4.1	BSD Type
APX Radio Product Family	A7.16	CRC Algorithm	CRC Calculation Logic	N/A (published in PC Tech Magazine 4/85	n/a	Public Domain
APX Radio Product Family	A7.16	data transfer protocol	Zmodem Protocol	http://www.omen.com	n/a	Public Domain
APX Radio Product Family	A7.16	Compression	LZMA SDK	http://www.7-zip.org/sdk.html	4.65	Public Domain
APX Radio Product Family	A7.16	Fonts Library	DejaVu Fonts	http://dejavu.sf.net	2.3	BSD Type + Public Domain
APX Radio Product Family	A7.16	Encryption Libraries	Part of Commercial TRECK IP Stack: OpenSSL, OpenBSD, WIDE Project Functions	http://www.highintegritysystems.com	N/a	BSD Type
APX Radio Product Family	A7.16	Geographic Translator	MSP GEOTRANS	http://earth-info.nima.mil/GandG/geotrans/	3.0	GEOTRANS
APX Radio Product Family	A7.16	vocoder	G711	https://frostie.cs.ucl.ac.uk/repos/mmedia/rat/tags/for_isabelle/codec_g711.c	G911c	Sun MIT style
Astro Radio Products: APX CPS						
APX CPS	A7.16	Encryption	THE BLOWFISH ENCRYPTION ALGORITHM	http://www.schneier.com/blowfish-download.html	19960625	Public Domain
APX CPS	A7.16	wav file parsing	WaveEdit	http://www.codeproject.com/KB/audio-video/WaveEdit.aspx	2004 July 28	Freeware
APX CPS	A7.16	drag and drop functionality	DragDropManager	http://pavanpodila.spaces.live.com/blog/cns!9C9E888164859398!199.entry	39041	Freeware
APX CPS	A7.16	drag and drop functionality	ListViewDragDropManager	http://www.codeproject.com/KB/WPF/ListViewDragDropManager.aspx	Jan. 2007	CPOL 1.02
APX CPS	A7.16	Images from this library	Visual Studio 2008 Image Library	http://msdn.microsoft.com/en-us/library/ms247035.aspx	2008 Image Library	Visual Studio Redistributables
APX CPS	A7.16	FlashPlayer	Adobe Flash Player	http://www.adobe.com/	10.x	Adobe Distribution License + End User License

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
APX CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.02	BSD Type
APX CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.03 Beta	BSD Type
APX CPS	A7.16	Expression Evaluation Library	Expression Evaluator for C# based on Expression Tree	http://www.codeproject.com/KB/recipes/expression_evaluator.aspx	38261	Freeware
APX CPS	A7.16	Reports Libraries	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	N/A	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008 LICENSE AGREEMENT - DISTRIBUTION
APX CPS	A7.16	Compression Library	fastlzlib	http://github.com/exalead/fastlzlib	n/a	MIT
APX CPS	A7.16	Compression Library	LZRW3-A	http://ross.net/compression/lzrw3a.html	n/a	Public Domain
APX CPS	A7.16	Compression Library	SharpZipLib	http://www.icsharpcode.net/OpenSource/SharpZipLib/Default.aspx	0.85.5	GPLv2 + Classpath Linking Exception
APX CPS	A7.16	Encryption Library	ACryptoHash.Net	http://sourceforge.net/projects/acryptohashnet	1.0-beta	LGPLv2.1
APX CPS	A7.16	Encryption / Network utiltities/libraries	openssl	http://www.openssl.org/	1.0.0d	Dual BSD Type
APX CPS	A7.16	Compression Library	LZMA SDK	http://www.7-zip.org/sdk.html	4.65	Public Domain
APX CPS	A7.16	WPF Utilities Library	Microsoft patterns & practices: Prism	http://compositewpf.codeplex.com/	4	Microsoft Patters and Practices License + Creative Commons Attribution License 3.0 Unported

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
APX CPS	A7.16	Windows SDK	Windows SDK for Windows Server 2008 and .NET Framework 3.5	http://msdn.microsoft.com/en-us/windowsserver/bb986638.aspx	6.1	Windows Server 2008 and .NET Framework 3.5 License
APX CPS	A7.16	Database	Microsoft SQL Server 2008 Express	http://www.microsoft.com/Sqlserver/2008/en/us/express.aspx	2008	Microsoft SQL Express Distribution License
APX CPS	See Motorola Common License Library (CLL)					
APX CPS	See Windows Supplemental CD					
Astro Radio Products: HPD Modem						
HPD Modem	A7.16	C Run-Time library	avr-libc	http://www.nongnu.org/avr-libc	1.0.4	BSD Type
HPD Modem	A7.16	Unicode Libraries	ICU	http://www.icu-project.org	2.8	BSD Type
HPD Modem	A7.16	Encryption	MD4	http://tools.ietf.org/html/rfc1320, http://tools.ietf.org/html/rfc1321	n/a	RSA License (BSD Type)
HPD Modem	A7.16	Encryption	MD5 Message-Digest Algorithms	http://tools.ietf.org/html/rfc1320, http://tools.ietf.org/html/rfc1321	n/a	RSA License (BSD Type)
HPD Modem	A7.16	implements the Microsoft Challenge-Handshake	MSCHAP	http://tools.ietf.org/html/rfc2433	n/a	ISC License (Modified BSD-Type)
HPD Modem	A7.16	C++ Library	STLPort	http://www.stlport.org	04.06.02	BSD Type
Astro Radio Products: HPD Modem CPS						

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
HPD Modem CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.02	BSD Type
HPD Modem CPS	A7.16	Driver Libraries	1-Wire Drivers	http://www.maxim-ic.com/	4.03 Beta	BSD Type
HPD Modem CPS	A7.16	FlashPlayer	Adobe Flash Player	http://www.adobe.com/	n/a	Adobe Distribution License + End User License
HPD Modem CPS	A7.16	Reports Libraries	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	N/A	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008	CRYSTAL REPORTS BASIC FOR MICROSOFT VISUAL STUDIO 2008 LICENSE AGREEMENT - DISTRIBUTION
HPD Modem CPS	A7.16	Standard Template Library	Standard Template Library	ftp://butler.hpl.hp.com/stl http://www.acm.org/crossroads/xrds2-3/ovp.html	N/A	BSD Type
HPD Modem CPS	A7.16	Windows Registry Utilities	Windows Registry Utilities	http://www.codeguru.com	N/A	Freeware
HPD Modem CPS	A7.16	Windows Key Handling	Windows Key Handling Utilities	http://www.codeguru.com	N/A	Freeware
HPD Modem CPS	A7.16	Encryption	THE BLOWFISH ENCRYPTION ALGORITHM	http://www.schneier.com/blowfish-download.html	19960625	Public Domain
HPD Modem CPS	A7.16	GUI Utilities	Macintosh-like Slider Control (Windows Programming)	http://www.codeguru.com	N/A	Freeware
HPD Modem CPS	A7.16	GUI Utilities	MFC Grid Control	http://www.codeguru.com	N/A	Freeware
HPD Modem CPS	A7.16	GUI Utilities	Edit Controls	http://www.codeguru.com	N/A	Freeware

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
HPD Modem CPS	See Windows Supplemental CD					
MISC. OPTIONAL MOTOROLA SOLUTIONS PRODUCTS						
MCD 5000 Products: MCD5000 Configuration Tool						
MCD5000_ACP_CT	2.2	Security - Cryptography	AES-256	http://www.literatecode.com/	5-May-09	BSD 2-Clause License ("Simplified" BSD)
MCD5000_ACP_CT	2.2	Security - Applications/Services	PuTTY	http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html	0.6	MIT License (MIT)
MCD5000_ACP_CT	2.2	User Interface Technologies	CTreeCtrlMultiColumn	http://www.codeguru.com/cpp/controls/treeview/misc-advanced/article.php/c671	19-Oct-98	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	XFloorWnd	http://www.codeguru.com/Cpp/COM-Tech/activex/controls/article.php/c2653	21-Dec-98	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	CProgressBar	http://www.codeproject.com/KB/miscctrl/progressbar.aspx	1.4	Code Project Open License Version 1.02 (CPOL-1.02)
MCD5000_ACP_CT	2.2	User Interface Technologies	SplashWnd	http://www.codeproject.com/kb/dialog/dialogspl.aspx	1	Freeware
MCD5000_ACP_CT	2.2	User Interface Technologies	ControlPos	http://www.codeguru.com/cpp/w-d/dislog/resizabledialogs/article.php/c1947	1.01	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	XListCtrl	http://www.codeproject.com/KB/list/xlistctrl.aspx	1.3	Code Project Open License Version 1.02 (CPOL-1.02)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCD5000_ACP_CT	2.2	User Interface Technologies	CustomizedReportListCtrl	http://www.codeproject.com/KB/list/CustomizedReportListCtrl.aspx	Dec-03	Code Project Open License Version 1.02 (CPOL-1.02)
MCD5000_ACP_CT	2.2	User Interface Technologies	DrawingBitmapTransparently	http://www.codeguru.com/cpp/g-m/bitmap/specialeffects/article.php/c1749	5-Aug-98	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	YABFFW	http://www.codeguru.com/cpp/w-p/files/browserfunctionsdialogs/article.php/c4443	18-Aug-03	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	SortTextItems	http://www.codeguru.com/cpp/controls/listview/sorting/article.php/c969	16-Aug-98	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	CMNCTRL1 Samples	http://msdn.microsoft.com/en-us/library/ftzc04bf(VS.80).aspx	n/a	CodeGuru License
MCD5000_ACP_CT	2.2	User Interface Technologies	MFC Grid Control	http://www.codeproject.com/Articles/8/MFC-Grid-control-2-27	2.27	Custom
MCD5000_ACP_CT	2.2	User Interface Technologies	GetFolder	http://www.codeguru.com/cpp/w-p/files/browserfunctionsdialogs/article.php/c4465/index.html	13-Feb-01	CodeGuru License
MCD 5000 Products: MCD5000 OMC						
MCD5000_OMC	2.2	Security - Applications/Services	libssh2	http://www.libssh2.org	1.2.6	BSD 3-Clause License ("Modified" BSD)
MCD5000_OMC	2.2	Database Technologies - Application	libmysqlpp	http://tangentsoft.net/mysql++/	3.1.0-1	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
MCD5000_OMC	2.2	Operating Systems - Desktop/Server	Red Hat Enterprise Linux	http://www.redhat.com	5.8	GNU General Public License Version 2.0 or Later (GPL-2.0+)
MCD 5000 Products: MCD5000 Gateway Unit (GU)						
MCD5000_GU	2.2	User Interface Technologies	SIL (OFL)	http://www.sil.org/resources/software_fonts	NA	Custom
MCD5000_GU	2.2	Web Technologies	jQuery-Validation	http://jqueryvalidation.org/	1.13.1	MIT License (MIT)
MCD5000_GU	2.2	User Interface Technologies	mplus-1c-bold-font	http://www.fonts2u.com/m-1c-bold.font	1.047	Freeware
MCD5000_GU	2.2	Middleware - Application Library	libroxml	http://www.libroxml.net/index.html	2.3.0	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
MCD5000_GU	2.2	Connectivity - Protocol Stacks	NETBSD - TELNET Definitions	http://cvsweb.netbsd.org/bsdweb.cgi/src/include/arpa/telnet.h?rev=1.11&content-type=text/x-cvsweb-markup	n/a	BSD 3-Clause License ("Modified" BSD)
MCD5000_GU	2.2	Security - Cryptography	RSA MD5 Message-Digest Algorithm	http://www.ietf.org	n/a	Custom
MCD5000_GU	2.2	Data Compression	zlib	http://www.zlib.net/	1.1.3	zlib/libpng License
Unified Network Services (UNS)						
UNS	UNS5.0	Middleware - Application Library	Python	https://www.python.org/	2.6.6	PYTHON License v2.0
UNS	UNS5.0	User Interface Technologies	wxPython	http://www.wxpython.org/	2.8	GNU Library General Public License v2 or Later (LGPL-2.0+)
UNS	UNS5.0	Connectivity - Protocol Stacks	SuperWebSocket	https://superwebsocket.codeplex.com/	0.7	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNS	UNS5.0	Connectivity - Protocol Stacks	OpenPop.NET	http://hpop.sourceforge.net/	2.0.6.1102	Creative Commons Public Domain Dedication
UNS	UNS5.0	Security - Cryptography	pyOpenSSL	https://launchpad.net/pyopenssl	0.11	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UNS	UNS5.0	Middleware - Application Library	.NET framework	http://www.microsoft.com/NET/	4.5.2	Custom
UNS	UNS5.0	Database Technologies - Application	Microsoft SQL Server Express	http://www.microsoft.com/en-us/server-cloud/products/sql-server-editions/	2012	Custom
UNS	UNS5.0	Middleware - Application Library	Microsoft Enterprise Library	http://msdn.microsoft.com/en-us/library/ff632023.aspx	5	Microsoft Public License (MS-PL)
UNS	UNS5.0	Logging Services	log4net	http://logging.apache.org/log4net	1.2.10	Apache License 2.0 (Apache-2.0)
UNS	UNS5.0	Middleware - Application Library	OpenSSL.NET	http://openssl-net.sourceforge.net/	1.0.1.5	BSD 2-Clause License ("Simplified" BSD)
UNS	UNS5.0	Security - Cryptography	OpenSSL	http://www.openssl.org	0.9.8k-FIPS	OpenSSL License
UNS	UNS5.0	Middleware - Application Library	xerces-C++	http://xerces.apache.org/xerces-c/	2.5.0	Apache License 1.1 (Apache-1.1)
UNS	UNS5.0	Middleware - Application Library	SharpZipLib	http://www.icsharpcode.net/opensource/sharpziplib/	0.84.0.0	GNU General Public License Version 2.0 or Later (GPL-2.0+) + CLASSPATH Exception
UNS	UNS5.0	Web Technologies	DotNetNuke	http://www.dotnetnuke.com/	05.05.00	MIT License (MIT)
UNS	UNS5.0	Middleware - Application Library	C# IP Address Control	http://www.codeproject.com/KB/miscctrl/IpAddrCtrlLib.aspx	VS2005 / VS2008	MIT License (MIT)
UNS	UNS5.0	Middleware - Application Library	Bounded Blocking Queue (One Lock)	http://www.codeproject.com/KB/recipes/boundedblockingqueue.aspx	08/17/2004 – V1	Freeware

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNS	UNS5.0	Middleware - Application Library	expat	http://expat.sourceforge.net/	1.95.7	MIT License (MIT)
UNS	UNS5.0	Middleware - Application Library	libxml++	http://libxmlplusplus.sourceforge.net/	1.0.0	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
UNS	UNS5.0	Data Compression	zlib	http://www.zlib.net	1.2.3	zlib/libpng License
UNS	UNS5.0	Data Compression	SevenZipSharp	http://sevenzipsharp.codeplex.com/	0.64	GNU Lesser General Public License v3 or Later (LGPL-3.0+)
UNS	UNS5.0	Middleware - Application Library	libiconv	http://www.gnu.org/s/libiconv/	1.9.1	GNU Library General Public License v2 or Later (LGPL-2.0+)
UNS	UNS5.0	Logging Services	log4cxx	http://logging.apache.org/log4cxx	0.10.0	Apache License 2.0 (Apache-2.0)
UNS	UNS5.0	Database Technologies - Application	Microsoft.SqlServer.Types	http://www.nuget.org/packages/Microsoft.SqlServer.Types/	11.0.1	Custom
UNS	UNS5.0	Engineering and Product Development Tools	libxml2	http://xmlsoft.org/index.html	2.7.6	MIT License (MIT)
UNS	UNS5.0	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1c-FIPS	OpenSSL License
UNS	UNS5.0	Security - Cryptography	OpenSSL	http://www.openssl.org	1.0.1c-FIPS	OpenSSL License
UNS	UNS5.0	Engineering and Product Development Tools	libxml2	http://xmlsoft.org/index.html	2.9.0	MIT License (MIT)
UNS	UNS5.0	Connectivity - Networking Services	c-ares	http://c-ares.haxx.se	1.9.1	MIT License (MIT)
UNS	UNS5.0	Connectivity - Protocol Stacks	IETF Standards	http://www.ietf.org	RFCs 3261-3265	Custom

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
UNS	UNS5.0	Security - Cryptography	RFC3174 - SHA1	http://www.rfc-editor.org/rfc/rfc3174.txt	n/a	Custom
UNS	UNS5.0	Security - Cryptography	RSA MD5 Message-Digest Algorithm	http://www.ietf.org	n/a	Custom
UNS	See Motorola Common Password Vault					
UNS	See Windows Supplemental CD					
UNS	See Motorola Common License Library (CLL)					
UNS Configuration Manager (PSCM)						
PSCM	UNS5.0	Office/Document Processing	Adobe Flash Player	http://www.adobe.com	10.1	Custom
PSCM	UNS5.0	Web Technologies	Apache Tomcat Web Server	http://tomcat.apache.org	8.0.15	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	metro.webservices-rt	https://metro.java.net/	2.1.1	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	metro.webservices-api	https://metro.java.net/	2.1.1	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Engineering and Product Development Tools	JNA platform	https://github.com/twall/jna	3.2.7	GNU Lesser General Public License v2.1 Only (LGPL-2.1)
PSCM	UNS5.0	Database Technologies - Enterprise	PostgreSQL	http://www.postgresql.org/	9.3	PostgreSQL License (PostgreSQL)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Middleware - Application Library	Apache commons-daemon	http://commons.apache.org/proper/commons-daemon	1.0.15	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	spring-tomcat-weaver	http://projects.spring.io/spring-framework/	2.5.6	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Logging Services	log4jna	http://log4jna.codeplex.com/	1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	Spring Framework	http://spring.io/	4.1.2.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	Spring Framework	http://spring.io/	4.1.5.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	spring-boot	http://projects.spring.io/spring-boot/	1.2.2.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	JNA	https://github.com/twall/jna/	4.1.0	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Engineering and Product Development Tools	ASM	http://asm.ow2.org/	3.3.1	BSD 3-Clause License ("Modified" BSD)
PSCM	UNS5.0	Database Technologies - Application	PostgreSQL JDBC Driver	http://www.postgresql.org	9.3-1102 JDBC 41	PostgreSQL License (PostgreSQL)
PSCM	UNS5.0	Logging Services	SLF4J	http://www.slf4j.org	1.7.10	MIT License (MIT)
PSCM	UNS5.0	Web Technologies	jersey-client	http://jersey.java.net/	1.19	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	jersey-core	http://jersey.java.net/	1.19	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	javax.json	http://jsonp.java.net	1	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Middleware - Application Library	xml-apis	http://xml.apache.org/commons/components/external	1.4.01	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	xml-apis	http://xml.apache.org/commons/components/external	1.3.04	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	jaxb-api	https://jaxb.java.net/	2.2.6	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Logging Services	log4j	http://logging.apache.org/log4j	1.2.14	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	javax.servlet.servlet-api	http://www.oracle.com/technetwork/java/index-jsp-135475.html	3.0.1	Common Development and Distribution License 1.0 (CDDL-1.0)
PSCM	UNS5.0	Middleware - Application Library	Jackson Core	http://wiki.fasterxml.com/JacksonHome	2.4.5	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Jackson Core	http://wiki.fasterxml.com/JacksonHome	2.4.5	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	javax.ws.rs.jsr311-api	https://jsr311.java.net/	1.1.1	Common Development and Distribution License 1.0 (CDDL-1.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-codec	http://commons.apache.org/codec/	1.9	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-io	https://commons.apache.org/proper/commons-io/	1.2	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	geronimo-jms_1.1_spec	http://geronimo.apache.org/	1.1.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Engineering and Product Development Tools	aspectjweaver	http://eclipse.org/aspectj	1.8.3	Eclipse Public License 1.0 (EPL-1.0)
PSCM	UNS5.0	Middleware - Application Library	cglib	https://github.com/cglib/cglib	2.2.2	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Middleware - Application Library	snakeyaml	https://bitbucket.org/asomov/snakeyaml	1.14	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	snakeyaml	https://bitbucket.org/asomov/snakeyaml	1.6	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	snakeyaml	https://bitbucket.org/asomov/snakeyaml	1.8-beta	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	cglib	https://github.com/cglib/cglib	2.2	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	Apache Wicket	http://wicket.apache.org/	1.5.7	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	Apache Wicket	http://wicket.apache.org/	6.20.0	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Security - Applications/Services	org.springframework.security.spring-security	http://projects.spring.io/spring-security/	3.2.5.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Logging Services	logback	http://logback.qos.ch	1.1.2	Eclipse Public License 1.0 (EPL-1.0)
PSCM	UNS5.0	Engineering and Product Development Tools	org.aspectj	http://eclipse.org/aspectj	1.8.5	Eclipse Public License 1.0 (EPL-1.0)
PSCM	UNS5.0	Logging Services	log4j-over-slf4j	http://www.slf4j.org	1.7.10	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-exec	http://commons.apache.org/proper/commons-exec/	1.2	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-exec	http://commons.apache.org/proper/commons-exec/	1.3	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	spring-web	http://projects.spring.io/spring-framework/	3.2.8.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	Apache Tomcat Webserver (Embed)	http://tomcat.apache.org	8.0.20	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	jose4j	https://bitbucket.org/b_c/jose4j/wiki/Home	0.4.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-cli	http://commons.apache.org/proper/commons-cli/	1.2	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Middleware - Application Library	Jackson Core	http://wiki.fasterxml.com/JacksonHome	2.5.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	spring-data	http://projects.spring.io/spring-data-jpa/	1.3.5.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	spring-data-commons	http://projects.spring.io/spring-data-jpa/	1.5.3.RELEASE	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache httpcomponents-httpcore	http://hc.apache.org/	4.4.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache httpcomponents-httpclient	http://hc.apache.org/	4.4.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	hibernate	http://hibernate.org/orm	3.6.5.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
PSCM	UNS5.0	Middleware - Application Library	antlr	http://www.antlr.org/index.html	2.7.6	Public Domain
PSCM	UNS5.0	Web Technologies	hibernate-entitymanager	http://hibernate.org/orm	3.6.5.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
PSCM	UNS5.0	Web Technologies	hibernate-validator	http://hibernate.org/validator/	4.1.0.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
PSCM	UNS5.0	Web Technologies	hibernate-jpa-2.0-api	http://hibernate.org	1.0.0.FINAL	Eclipse Public License 1.0 (EPL-1.0)
PSCM	UNS5.0	Web Technologies	hibernate-commons-annotations	http://hibernate.org/	3.2.0.FINAL	GNU Lesser General Public License v2.1 or Later (LGPL-2.1+)
PSCM	UNS5.0	Connectivity - Protocol Stacks	snmp4j	http://www.snmp4j.org/	1.10.2	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Connectivity - Protocol Stacks	snmp4j	http://www.snmp4j.org/	2.2.3	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Security - Cryptography	jasypt	http://www.jasypt.org/	1.7	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-collections	http://commons.apache.org/proper/commons-collections/	3.2.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	javax.transaction.jta	http://java.sun.com/products/jta	1.1	Common Development and Distribution License 1.0 (CDDL-1.0)
PSCM	UNS5.0	Security - Cryptography	BouncyCastle - Java	http://www.bouncycastle.org	1.44	MIT License (MIT)
PSCM	UNS5.0	Engineering and Product Development Tools	ASM	http://asm.ow2.org/	3.1	BSD 3-Clause License ("Modified" BSD)
PSCM	UNS5.0	Web Technologies	jersey-container-servlet-core	https://java.net/projects/jersey/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	jersey-common	https://java.net/projects/jersey/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	jersey-server	https://java.net/projects/jersey/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	jersey-client	http://jersey.java.net/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	hk2.external.asm-all-repackaged	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Middleware - Application Library	hk2.external.javax.inject	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	Javassist	http://www.javassist.org/	3.18.2.GA	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Data Compression	Zip4j	http://www.lingala.net/zip4j/	1.3.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-io	http://commons.apache.org/io	2.4	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Guava	https://code.google.com/p/guava-libraries/	14.0.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Connectivity - Networking Services	Apache commons-dbcp	http://commons.apache.org/dbcp/	1.4	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	hk2.external.cglib	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	dom4j	http://dom4j.sourceforge.net/	1.6.1	BSD 3-Clause License ("Modified" BSD)
PSCM	UNS5.0	Middleware - Application Library	javax.ws.rs-api	https://jax-rs-spec.java.net/	2	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Web Technologies	xalan-j	http://xml.apache.org/xalan-j/	2.7.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Connectivity - Protocol Stacks	Apache commons-net	http://commons.apache.org/net	2	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	javax.validation.validation-api	http://beanvalidation.org/	1.0.0.GA	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	activemq-core	http://activemq.apache.org/	5.5.0	Apache License 2.0 (Apache-2.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Web Technologies	jQuery	http://jquery.com/	1.9.0	MIT License (MIT)
PSCM	UNS5.0	Middleware - Application Library	osgi	http://www.osgi.org/Download/HomePage	4.1.0	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.5.4	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	geronimo-j2ee-management_1.1_spec	http://geronimo.apache.org/	1.0.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	geronimo-j2ee-management_1.1_spec	http://geronimo.apache.org/	1.1.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	hk2.locator	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	hk2.utils	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	jmustache	https://github.com/samskivert/jmustache	1.8	BSD 3-Clause License ("Modified" BSD)
PSCM	UNS5.0	Logging Services	Apache commons-logging	http://commons.apache.org/proper/commons-logging/	1.1.3	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Web Technologies	javax.inject	https://code.google.com/p/atinject/	1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Engineering and Product Development Tools	aspectjrt	http://eclipse.org/aspectj	1.7.2	Eclipse Public License 1.0 (EPL-1.0)
PSCM	UNS5.0	Middleware - Application Library	hk2.osgi-resource-locator	https://java.net/projects/hk2	1.0.1	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	javax.annotation-api	https://jcp.org/en/jsr/detail?id=250	1.2	Common Development and Distribution License 1.1 (CDDL-1.1)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
PSCM	UNS5.0	Web Technologies	Bootstrap	https://github.com/twbs/bootstrap	3.1.1	MIT License (MIT)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-lang	http://commons.apache.org/lang/index.html	2.4	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Aopalliance	http://aopalliance.sourceforge.net/	1	Public Domain
PSCM	UNS5.0	Middleware - Application Library	activemq-kahadb	http://activemq.apache.org/	5.5.0	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	activemq-protobuf	http://activemq.apache.org/	1.1	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	activeio-core	http://activemq.apache.org/	3.1.2	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	hk2.api	https://java.net/projects/hk2	2.1.88	Common Development and Distribution License 1.1 (CDDL-1.1)
PSCM	UNS5.0	Middleware - Application Library	jqwicket	https://code.google.com/p/jqwicket/	0.7	Apache License 2.0 (Apache-2.0)
PSCM	UNS5.0	Middleware - Application Library	Apache commons-pool	http://commons.apache.org/pool/	1.6.0	Apache License 2.0 (Apache-2.0)
PSCM	See Motorola Common Password Vault					
Identity Management Server (IDM_Server)						
IDM_Server	UNS5.0	Middleware - Application Library	Python-requests	https://pypi.python.org/pypi/requests	2.7.0	Apache License 2.0 (Apache-2.0)
IDM_Server	UNS5.0	Middleware - Application Library	Boost	http://www.boost.org/users/history/version_1_58_0.html	1.58.0	Boost License (BPL-1.0)

Product	Product Release	OSS Package Component Type	OSS Package	OSS Package WebSite	OSS Version	OSS License Category
IDM_Server	UNS5.0	Engineering and Product Development Tools	Apache JMeter	http://jmeter.apache.org/index.html	2.13	Apache License 2.0 (Apache-2.0)
IDM_Server	See Common Red Hat Linux Platform (RHEL6.x)					
IDM_Server	See Common Red Hat Linux Platform (RHEL6.x) - Optional					
IDM_Server	See Common Software Repository - PERL					