

Form No. DMS 234A (Rev. 1/86)  
 AUTHORITY: Act 431 of 1984  
 COMPLETION: Required  
 PENALTY: Failure to deliver in accordance with Contract terms  
 and conditions and this notice may be considered in default of Contract

STATE OF MICHIGAN  
 DEPARTMENT OF MANAGEMENT AND BUDGET  
 OFFICE OF PURCHASING  
 P.O. BOX 30026, LANSING, MI 48909  
 OR  
 530 W. ALLEGAN, LANSING, MI 48933

May 1, 1998

CHANGE NOTICE NO. 12  
 TO  
 CONTRACT AGREEMENT NO. 071B5000240  
 between  
 THE STATE OF MICHIGAN  
 and

NAME & ADDRESS OF VENDOR <b>Motorola, Inc.</b> <b>DBA/Motorola Communications &amp; Electronics, Inc.</b> <b>Attn: Martin J. Rogan</b> <b>1309 East Algonquin Road</b> <b>Schaumburg, IL 60196</b>		TELEPHONE Martin J. Rogan <b>(817) 538-6051</b>  <b>Christine Paul</b> <i>Christine Michel</i>
<b>800 MHz Radio System - Dept. of State Police</b>		
BPO PERIOD: 175 months		From: <b>December 8, 1994</b> To: <b>June 8, 2009</b>
TERMS <b>Net 30 Days</b>	SHIPMENT <b>As Specified Herein</b>	
F.O.B. <b>Delivered/Installed</b>	SHIPPED FROM <b>Various Locations</b>	
MINIMUM DELIVERY REQUIREMENTS <b>N/A</b>		

**NATURE OF CHANGE:**

Effective immediately, the attached modifications are hereby incorporated into this contract.

**AUTHORITY/REASON:**

Agency & AG's office request; vendor concurrence.

TOTAL CONTRACT VALUE REMAINS: \$187,275,915.00

**CONTRACT CHANGE NOTICE NO. 13**  
**TO THE**  
**STATE OF MICHIGAN**  
**800 MHZ RADIO SYSTEM & TELECOMMUNICATIONS BACKBONE NETWORK**  
**CONTRACT NO. 071B5000240**  
**BETWEEN**  
**THE STATE OF MICHIGAN**  
**AND MOTOROLA, INC.**  
**DATED DECEMBER 8, 1994**

Pursuant to the terms of Section 1.41 General, subparagraph B, the following modifications are hereby made:

- 1.) Add the Attached State of Michigan APC Codes schedule, dated June 1998 to Exhibit E. The State shall have the right to purchase the products listed on the schedule at their stated discount from Motorola's then current list price.
- 2.) In Exhibit E, Table of Contents, Section IV OPTIONAL PRICING, add a new sub-paragraph H., entitled MOSCAD Pricing, and add the attached MOSCAD Pricing list in sub-paragraph H.
- 3.) In Exhibit A - Section 9.5.2 Mechanical system Details - sub-paragraph 1, replace lead/lag controller-thermostat with Sentry Microprocessor controller as shown

1     ~~a lead/lag Sentry Microprocessor controller controller thermostat~~

delete sub-paragraphs 12 and 13 and replace with the following:

12.     All HVAC equipment shall be controlled by wall mounted controls to monitor and control indoor temperature and relative humidity.

13     The Sentry Microprocessor controller shall be wall mounted type with visible set point temperature indicator. The Sentry Microprocessor controller shall have external adjustments for minimum and maximum settings.

The cost to provide the new HVAC controller as requested is provided below, relative to Phase 1 Field Retro and Phase 2 Field or Factory Retro as applicable

Phase 1 Sites:	Cost
• Twenty three (23) Sites	
• Forty eight (48) Marvair Units	
• Twenty four (24) Sentry Microprocessor Controllers	\$ 2,150.00 ea x 24
• Forty eight (48) Field retrofits	\$ 1,100.00 ea x 48
• Total Phase 1 HVAC controller retrofits is:	\$ 104,400.00

<u>Phase 2 Sites:</u>	<u>Cost</u>
• Thirty six (36) Sites	
• Seventy nine (79) Marvair HVAC Units	
• Forty (40) Sentry Microprocessor Controllers	\$ 2,150.00 ea x 40
• Twenty two (22) Field retrofits (HVAC units)	\$ 1,100.00 ea x 22
 Total Phase 2 HVAC controller retrofits is:	 \$ 110,200.00

The above pricing applies to Phase 1 and Phase 2 only.

Optional One (1) each Pricing Relative to Future Requirements:

The Sentry Microprocessor is available upon selection of this option, and as a part of the acceptance of a Detailed Design Plan regarding future Phases. The following optional price expires on December 31, 2001

Sentry Microprocessor Controller	Cost
(One (1) each controller per two (2) Marvair HVAC Units)	\$ 3,193.00

- 4) In Exhibit A - Section 9 7.4 Gas Piping, Tank, and Foundations, delete the fourth sub-paragraph and replace with the following:

Motorola shall furnish and install, properly sized LPG fuel tanks with a low level fuel monitoring assembly and all associated control wiring and conduits as indicated on the drawings. The low level monitoring device shall be a model #7550 switch gauge assembly, as manufactured by Rochester Gauges, Inc. The devices shall be installed per DS-717. The required low level alarm point shall be coordinated with the State's project representative. The tanks shall be delivered to the appropriate Site with initial fuel fill, and secured to the fuel tank foundation.

Optional One (1) each Pricing Relative to Future Requirements:

The LPG Fuel Tanks are available upon selection of the desired option, and as a part of the acceptance of a Detailed Design Plan regarding future Phases. The following optional price(s) expires on December 31, 2001.

LPG Fuel Tanks:	Cost
One (1) each 1000 gallon LPG Fuel Tank	\$ 6,677.00
One (1) each 2000 gallon LPG Fuel Tank	\$15,146.00

- 5) In Exhibit A delete Section 6.0 TELECOMMUNICATIONS BACKBONE NETWORK (TBN) SYSTEM DESCRIPTION, in its entirety and replace with the following:

**6.0 TELECOMMUNICATIONS BACKBONE NETWORK (TBN)  
SYSTEM DESCRIPTION**

**6.1. General**

The Telecommunications Backbone Network (TBN) shall be a digital microwave network serving the Michigan State Police 800 MHz Radio System and State government. The TBN network implementation coincides with the four phases of the 800 MHz Radio System and the seven geographical State Police MSP districts. Implementation priority is to install the TBN in such a manner as to facilitate the schedule for the 800 MHz radio system implementation.

All TBN equipment shall be FCC type accepted and meet the industry standard DS1 or DS3 digital signal interfaces. DS3 radios require an external device to provide DS1 interface, except for Wayside DS1 channel.

**6.2. TBN Design**

Major design emphasis shall be placed on reliability, availability, network management, and maintenance. Leased telephone lines shall not be used for interconnection of the 800 MHz radio system, except for site 71Y, Northport, if all other microwave radio options for Northport have been exhausted. Connection to the TBN shall be at the DS1 level for the 800 MHz radio traffic. Future traffic additions will be by the addition of DS1 multiplex equipment at particular sites.

The TBN shall utilize frequencies in the 6 GHz and 18 GHz bands for Primary Backbone Network paths and 6 GHz or above for Spur Network paths. As outlined in Exhibit B - Statement of Work, Motorola shall conduct path surveys to determine actual antenna center lines. Building reflections and reflective surfaces in urban areas shall be taken into consideration in the path designs.

Motorola shall provide the frequency coordination search and prepare FCC license applications for the state and handle liaison with the FCC to facilitate license acquisition. The TBN design shall include prior frequency coordination to comply with all FCC rules and requirements.

All channel interfaces provided by the microwave system shall be at the DS1 level. M12 or M13 multiplex equipment shall be integrated with the microwave terminals or supplied as part of the package.

The TBN shall be fully compatible with the 800 MHz radio system, consoles, and channel banks, and shall not degrade or limit the performance of these systems or any subsystems.

**6.2.1. Design and Performance Responsibility**

Motorola has complete responsibility for the digital microwave network design and for the performance of the entire System. As a minimum, corrective actions to satisfy the long term availability requirements shall consist of installing space diversity configurations. Angular diversity shall not be used to meet long term availability requirements.

Motorola shall be responsible for both short term and long term path performance.

**6.2.2. Alternate Routing**

The System shall be implemented with the alternate routing capabilities as shown below. This option will be requested by the State at the time of Contract Release. The functional aspects of this alternate routing are shown below.

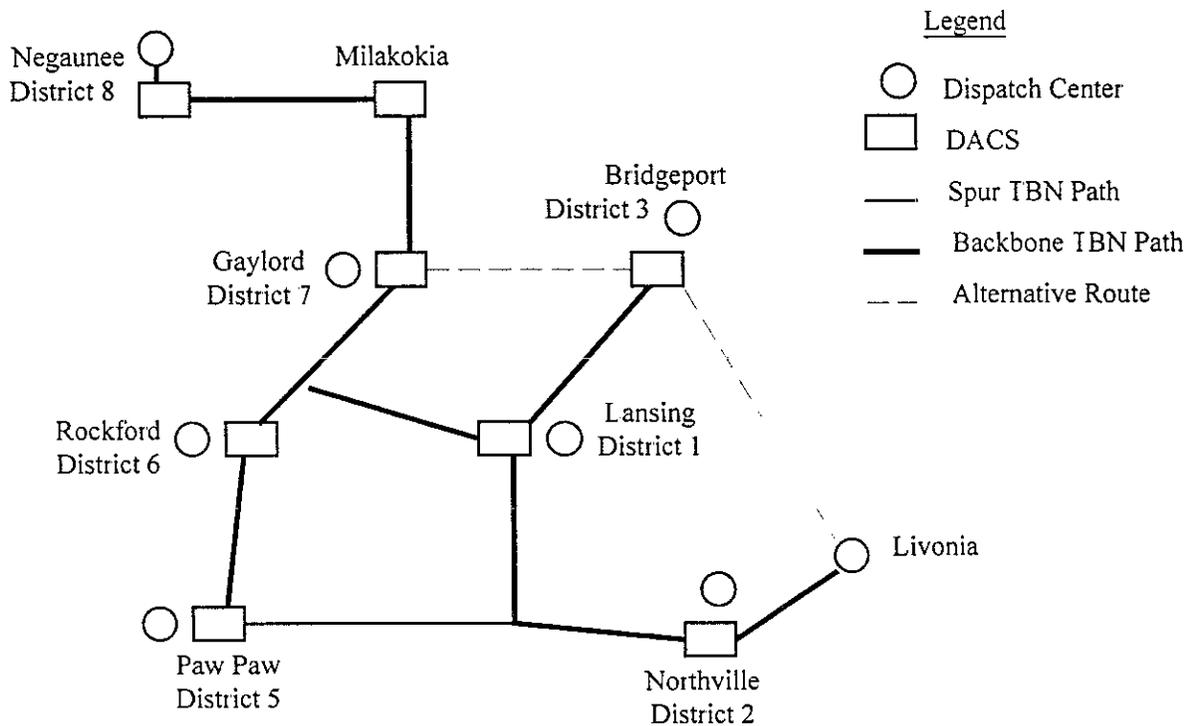


Figure 6 5 - Alternative Routing

**6.3. IBN Performance**

**6.3.1. Microwave Path Propagation Availability**

Motorola shall provide IBN microwave links to meet the following path availability criteria: 1) 99.9999% on all DS3 paths, and 2) 99.999% on all paths less than DS3.

**6.3.2. SECTION DELETED**

**6.3.3. Errored Second Performance**

All individual paths and routes in the TBN shall meet the AT&T errored second performance standards measured over 5 day as described as follows:

Circuit miles	End to End
<250	1.00%
250-1000	4.00%

**6.3.4. Diversity Protection**

Diversity protection shall be employed as required to meet the following availability specifications: backbone paths 99.9999%; non-backbone paths 99.999% long term availability.

**6.3.5. Equipment Configuration**

Monitored Hot Standby protection shall have a manual override switch which locks the transmitter and receiver on either the A or B channel. The front panel of the modem unit shall indicate which channel is on line and whether the system is working in automatic switch mode or manual override mode.

To improve the dispersive fade margin (DFM) of hops with excessive multipath fading, Adaptive Time Domain Equalizers (ATDE) shall be used. ATDEs shall be installed on all 6 GHz Primary Backbone DS3 radios.

#### 6.4. Special Requirements for Data Transmission CCO#10.2

The TBN shall provide error correction and a synchronized network which shall eliminate bit slips in normal operation and provide a high quality BER of  $10^{-6}$  during most microwave fades. Forward Error Correction (FEC) shall be provided using the Digital Data Service (DDS) 3-out-of-5 majority voting. The FEC shall be incorporated into the channel bank installed at every 800 MHz radio site.

A master/slave timing control configuration shall be employed in the TBN to ensure that data and voice transmissions are synchronous. The synchronization shall be traceable to UTC (Coordinated Universal Time). Synchronous timing control shall be derived from a Stratum 1 compliant Primary Reference Source (PRS). The synchronization is distributed to each digital equipment location through a master and tributary-like network. Transmissions shall be both bit and byte synchronized.

The timing system shall prohibit phase jitter and phase hit propagation through the TBN. If branches of the timing distribution network became detached, the individual timing supplies shall have sufficient frequency accuracy in a free-running mode to continue service without interruption. However, occasional slips may occur between the severed parts.

Several categories of DS1 (Primary Rate) connections are transported via the TBN.

1. Channelized DS1; channel bank to Digital Access and Cross Connect System (DACS)
2. Channelized DS1; DACS to DACS
3. Non-channelized DS1; packet switch to packet switch
4. Non-channelized DS1; CEB circuits

The system synchronization is traceable to Coordinated Universal Time (UTC) which is the time standard for North America. All channel banks shall be configured for loop timing. Each zone master site shall be equipped with a Primary Reference Source (PRS) which is traceable to UTC. The PRS will serve as the synchronization reference for the zone. The PRS will clock the DACS which, in turn, will clock all of the channelized DS1 circuits and the non-channelized DS1 circuits via the AEB. The packet switch will primarily be used for inter-zone connections.

The system synchronization shall employ a Modular Frequency/Time System (MFTS), by using signals from the universally-available Global Positioning System (GPS) to discipline high performance oscillators. The GPS Time Synchronization, traceable to universal time standards, shall be capable of utilizing a 48 VDC power source from the existing power supply used for the Telecommunications Backbone Equipment. The output frequency of the clock shall be 1544 MHz. The clock output will be tied into the DACS equipment at each master site. Each master site will have its own GPS disciplined timing source. The Timing System shall have built-in fault monitoring for remote reporting via RS232 and an optional Fault Terminal Relay board with N.C., N.O. and Common connections. The GPS unit's stability is  $\pm 5 \times 10^{-13}$  while disciplined, and while undisciplined the unit shall maintain a stability of  $\pm 2 \times 10^{-11}$ .

The antenna shall be quadrafilar helix volute. The antenna unit shall be mounted in a configuration that will maintain the highest space vehicle availability. The GPS antenna, if mounted outside, will have a lightning arrestor installed per Motorola R56 Install Standards.

The output of each MFTS in each zone will feed the Primary and Secondary inputs of the master DACS in the associated zone. The zone shall then recover this clock for synchronization purposes via the T-1s. In the case of a GPS failure, the Rubidium Oscillator will continue to keep synchronization until GPS tracking can be re-established. The Rubidium Oscillator will maintain stability at  $\pm 2 \times 10^{-11}$  while free running (undisciplined). During a Rubidium Oscillator failure the master DACS will revert back to its internal Stratum 3 free run clock. During path failures the

segregated (non master) DACS(s) in the same zone will then free run on their internal Stratum 3 Clock until the path is restored.

Clock Hierarchy is as follows: 1) Master Clock - Stratum-1 (GPS disciplined with Rubidium backup), 2) DACS - Stratum-3, and 3) Channel Bank - Stratum-4

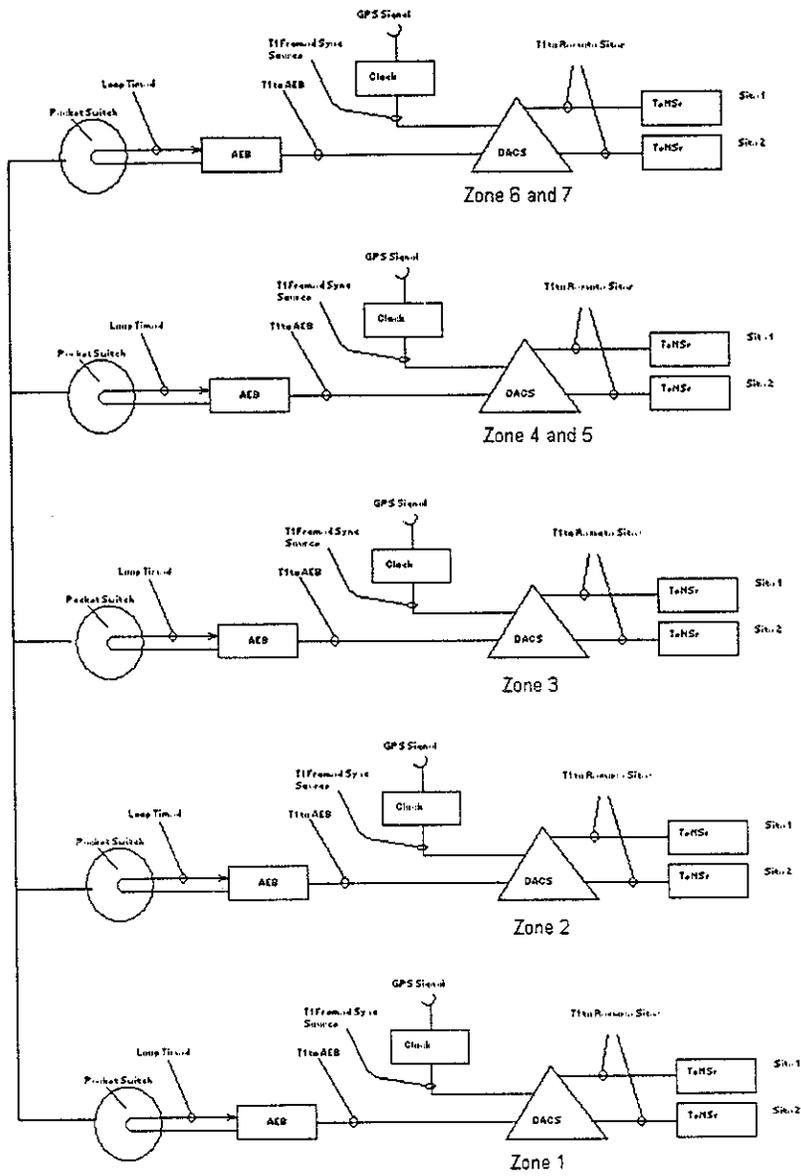


Figure 6.6 System Synchronization (CCO#10.2)

## **6.5. Capacity Requirements**

The TBN shall include all required capacity for the 800 MHz traffic. Additionally, at a minimum, 50 percent growth capacity shall be provided into the TBN.

The TBN shall include, at a minimum, capacity of 10 channels of 800 MHz radio traffic at each site. If the 10 channel per site expansion exceeds the 50 percent growth capacity, then the 10 channel per site expansion capacity shall govern the required bandwidth of the TBN.

### **6.5.1. Primary Backbone Network Bandwidth Requirement**

The Primary Backbone Network is defined as any link or combination of links that will carry traffic between Lansing and MSP District Dispatch Centers. The Primary Backbone Network shall have as a minimum one DS3 capacity (28 DS1s). The Mason Building shall also be included as part of the Primary Backbone Network.

Any link exceeding the 50% or up to 10 - 800 MHz channel per site growth capacity for 800 MHz circuits only, which exceeds 12 DS1s shall be considered part of the Primary Backbone Network.

### **6.5.2. Spur Network Bandwidth Requirement**

The spur network shall be equipped with a minimum capacity of 8 DS1s. The bandwidth required for the spur network shall support the 800 MHz traffic including the 50% growth capacity or 10 channel expansion capacity, whichever is greater.

## **6.6. Redundant Equipment**

### **6.6.1. General**

All microwave TBN transmitters, receivers and high speed multiplex equipment shall include automatically switched, hot standby equipment. The TBN shall ensure that failure of any hot standby equipment shall not effect operations.

Any failure or switch of the TBN equipment shall be alarmed at ACS terminals. Manual switching shall not cause alarms.

Major pieces of equipment used in the TBN shall include various levels of standby protection. As a minimum the following major equipment items will be equipped with standby protection components.

### **6.6.2. RF Radio Equipment**

All versions of the TBN radios shall provide various levels of protection to switch from radio A to radio B. Automatic switching shall occur when a module fails or if the receive signal falls below the radio Bit Error Rate (BER) threshold level. A second method of switching shall be a user-controlled, manual switch. Manual switching shall be used for maintenance and testing purposes. The radios shall be equipped with two switch planes. These are:

- 1) Digital Shelf
- 2) Transmitter Modulator/Receiver Demodulator

### **6.6.3. Digital Multiplexers**

All digital M1-3 multiplex equipment shall employ monitored hot standby 1:n protection for the low speed and high speed cards. Two types of M1-3 multiplexers will be employed; Alcatel's DMX-3003N and Alcatel's RD-3100e.

The Alcatel DMX-3003N low speed modules shall be protected on a 1:7 basis, the high speed cards shall be protected on a 1:1 basis.

The RDI-3100e combines low and high speed functions on a single card and is protected on a 1:1 basis. Automatic switching shall occur when a module fails or if the receive signal falls below the BER threshold level. A second method of switching shall be a user-controlled, manual switch.

#### **6.6.4. Digital Access and Cross Connect System**

Digital Access and Cross Connect System (DACCS) shall have redundancy incorporated into its architecture in the common equipment (e.g.: switch matrix and power supply units). The DS1 port modules are not redundant.

#### **6.6.5. Battery Chargers**

The battery chargers shall be designed as redundant units. Rectifier modules shall be sized for 1+n redundancy. Chargers are configured for load sharing unless loading dictates a hot standby configuration.

#### **6.7. Demarcation**

All multiplex sites shall include punch blocks (type 66 with split connectors or approved equal) for audio connection of radio or data channels. Punch blocks shall be mounted in EIA 19 inch racks.

DSX-1 digital cross connect panels shall be used to form the demarcation points for signals terminated at the DS1 primary path. There shall be a DSX-1 cross connect port provided for each DS1 dropped or cross connected at all sites.

The jackfields on the DSX-1 cross connect panels shall be wired and connected to allow independent testing of the "line" and the "equipment". The jackfields shall be equipped with a bridged monitor port for non intrusive testing.

All multiplex, signaling, data and audio cables which leave the shelter or equipment room shall be protected with gas discharge tubes or other approved surge protection devices complying with Motorola R56 standards.

## 6.8. TBN Microwave Equipment Technical Specifications

### 6.8.1. General Requirements

The TBN primary backbone radios shall utilize 10 MHz bandwidth for 28 DS1 capacity radios. The spur network radios shall utilize 3.75 MHz of bandwidth for 8 DS1 and 12 DS1 capacity radios. These radios shall be FCC type accepted/approved and meet the industry standard DS1 and DS3 digital signal interfaces.

All radios shall be supplied in EIA 19 inch racks. Multiplex equipment shall also be mounted in EIA 19 inch racks.

The radios shall be rated for continuous duty service in a fixed plant environment. With the exception of the transmitter relay, all switching within the 6 GHz radios shall be solid state. Relays shall also be permitted in the alarm output circuitry.

The TBN radios shall be equipped with the following features:

- 1) Forward Error Correction (FEC) - FEC shall enhance radio performance by correcting bit errors that occur during transmission.
- 2) When implemented, Automatic Power Control (APC) - APC shall hold transmitter power 10 dB lower than maximum and increase power only when a severe fade occurs.
- 3) Adaptive Time Domain Equalizer (ATDE) on DS3 radios - The Adaptive Time Domain Equalizer (ATDE) shall be a multiple-tap, transversal filter which shall be used when a radio operates on a path with excessive multipath activity.
- 4) Hot Standby transmitters shall normally operate at full power and are switched, not combined.
- 5) Multiple Protection Switching Layers - A multiple layer protection switching technique shall be used to improve the protection capabilities as well as prevent a local transmitter failure from affecting the local receiver and (vice versa). All cards that integrate transmit and receive functions shall be designed to allow switching of their transmit and receive sections independently.
- 6) Reverse Channel Switching - Reverse Channel Switching shall protect against silent TX failures. This feature shall allow a near-end radio to detect and counter problems at the far-end transmitter.
- 7) The Extended Link Monitor Channel (ELMC) provides service personnel with the ability to remain at one location and view real-time alarms, status, control and performance monitoring data. Also, the ELMC enables the same personnel to perform many provisioning (parameter setting) functions remotely (However, service-affecting functions such as radio operation mode, radio configuring, and remote address setting can not be provisioned or changed remotely). Remote access features and functionality will be available to all contiguously connected, ELMC equipped radios and RDI-3100e multiplex.

The Extended Link Monitor Channel uses a 16 kb/s command path in the radio overhead which is separate and distinct from the MCS-11 monitor and control system. User access is furnished by way of a properly configured personal computer connected to the RS232 serial data port on the radio or mux controller. Each ELMC device will have a unique case sensitive five character alphanumeric address which can only be assigned or changed locally. Any device(s) lacking a qualified address will be restricted access to the Extended Link Monitor Channel.

The ELMC option can be purchased by the State at above contract baseline.

- 8) Each DS3 radio unit shall be equipped with a Wayside unit. The Wayside unit provides a DS1 which is separate and distinct from the DS3 payload, and therefore does not require M13 multiplexing.

The Wayside unit option can be purchased by the State at above contract baseline.

All microwave radios employed in this system shall employ FEC and errorless receiver switching.

### 6.8.1.1. TBN Radio Specifications

Technical parameters of the radios are listed below:

System Definitions	MDR-5606	MDR-6506	MDR-6706
	DS3	8 DS1	12 DS1
Transmitter Power (Std)	29 dBm	29 dBm	29 dBm
Transmitter Power (High)	31 dBm	31 dBm	31 dBm
Receiver Sensitivity (Rxs) Threshold @ BER = 10e-6 for multiple DS1 radios guaranteed.		-83 dBm	-77 dBm
Threshold @ BER = 10e-7 for DS3 radios guaranteed.	-74.2 dBm		
Operational RXs	For Space Diversity configurations, the main and SD receivers have equal receiver threshold Full and equal system gain is provided for both receivers. For Hot-Standby radio configurations, the standby receiver threshold is 9 dB lower than the main receiver.		
RX Threshold Outage @ BER = 10e-3	-76.5 dBm	-85 dBm	-79 dBm
Dispersive Fade Margin @ BER = 10e-3	57 dB	57 dB	57 dB
Unfaded BER	10e-11	10e-11	10e-11

### 6.8.1.2. Equipment Metering

A properly configured personal computer shall interface with the 6 GHz radio via a craft interface. This interface shall provide the technician with radio control functions, alarm indicators and test point access. The interface shall further enable the operator to access menus which report the status of the radios and individual modules down to the circuit level. The craft interface also provides access to a continuously updated 255-event history log (alarms, events, etc.) and the 7-day performance statistics (BER, ES, SES, etc.) Further, the user shall be able to control both the local and remote radios through the craft interface (switching, loopback, etc.) Modular DS1 jackfields shall be provided as required based on the number of DS1s dropped or cross connected at each site. No jackfields shall be dropped in association with integral service channels.

6 GHz radios shall contain built in metering and test point facilities for maintenance and trouble shooting. The accuracy of the metering facility shall be such that all adjustments requiring these facilities shall meet the equipment requirement limits. As a minimum, the metering and test point facilities must provide measurement and monitoring of the following: transmitter power/receiver L.O., transmitter frequency, receiver signal level, transmitter AFC, receiver squelch, amplifier current, receiver BER, transmitter L.O., receiver AGC, and power supply voltage.

### 6.8.1.3. Orderwire System

All TBN radios shall be equipped with integral order-wire with DTMF, selective calling and an orderwire termination unit equipped with an internal 4-wire, 4-way bridge. One leg of the bridge shall be used within the termination unit, leaving three legs available for other orderwire uses. The Alcatel radios provided contain three (MDR-6000) or four (MDR-5606) 64 KB/s auxiliary channels. Typically the auxiliary channels are assigned as follows:

AUX 1	DTMF Orderwire
AUX 2	MCS-11 Fault Alarm
AUX 3	Voice or Data
AUX 4	Voice or Data

One of these VF channels shall be used for orderwire inter-site communications without disruption of primary traffic. All sites shall be equipped with a speaker and handset.

### 6.8.2. Operating Environment

The TBN radios shall operate and meet performance standards under the following conditions: 1) temperature range from 0-50 degrees Celsius, 2) relative humidity of 95 percent, and 3) altitude of 15,000 feet above mean sea level.

### 6.8.3. Connections

Electrical power connections shall be made using a screw/lug.

Standard DSX-1 patch bays shall be provided.

## 6.9. Antenna System

Motorola shall furnish and install all necessary antenna system components and ancillary equipment necessary for a complete and operational system.

Antenna types (standard, high performance or ultra high performance) and polarizations (single or dual) shall be determined by frequency coordination and FCC licensing requirements. Each microwave antenna shall be covered with a radome to reduce wind and ice load.

### 6.9.1. Technical Standards

The antenna system shall meet or exceed established requirements as described in the latest revision of EIA standards 222 and RS-195. Where the specification is more strict than the EIA standard, this specification shall take precedence over the EIA standards.

### 6.9.2. Antenna Types

Antennas shall be solid reflector low VSWR types for the 6.545 to 6.870 GHz and 18 GHz bands. Exact antenna sizes and types shall be determined by the frequency coordination constraints.

### 6.9.3. Antenna Radiation Patterns

Antenna radiation patterns shall conform to the standards referenced above. Motorola shall submit manufacturer's radiation pattern envelopes on all types of antenna proposed if requested by the State.

#### **6.9.4. Radiating Element**

Antenna feed or radiating element shall be single polarized type. Antenna shall have a 360 degree polarization adjustment of the feed. This adjustment shall be possible from the rear of the antenna dish. Pressurized antenna shall be capable of withstanding a continuous pressure of 10 pounds per square inch.

#### **6.9.5. VSWR**

Motorola shall adjust the VSWR of each antenna system using sweep return loss measurement equipment. Minimum return loss for the total antenna system shall be measured from the bottom connector. Dent tuning will not be allowed.

Return loss shall meet or exceed the return loss values as calculated using the antenna system manufacturer's recommended method.

#### **6.9.6. Mounting and Mounting Hardware**

The antenna shall attach to a vertical mount consisting of a standard 4-1/2" O.D. pipe. Pipe mounts are furnished and installed as part of each ground-mounted tower structure.

The mount shall allow a plus or minus 5 degree adjustment in both azimuth and elevation. An outboard stabilizer strut shall be used on all antennae of eight (8) feet or larger in diameter.

Locking nuts shall be installed on all antenna mounting and adjusting hardware. Adjusting hardware shall be stainless steel.

#### **6.9.7. Radomes**

All standard antennas shall be equipped with fiberglass reinforced plastic radomes. Radomes shall be unheated. Radomes shall be attached with manufacturer's hardware to the reflector. High performance and ultra high performance antennas shall be equipped with a planar type polymer coated radome. Planar type radomes shall be Andrew Corporation TEGLAR radomes.

Additional attenuation due to the radome shall not exceed 1.0 dB at 6 GHz.

#### **6.9.8. Wind Loading**

Antennas, including mounts, shall withstand without damage a 125 MPH wind with 0.5 inch of radial ice and shall maintain deflection to less than 0.1 degree in 70 MPH winds.

#### **6.9.9. Pressurization System**

Motorola shall furnish and install an Andrew Corporation fully automatic membrane dehydrator and pressurization system at the necessary Sites. The dehydrator and pressurization equipment shall be sized in accordance with the manufacturer's recommendations.

The pressurization system shall include a distribution manifold with a pressure gauge and shutoff valve for each transmission line plus one (1) extra port equipped with pressure gauge and shutoff valve. An additional bleeder valve shall be provided on the distribution manifold which is separate from the extra transmission line port. The pressurization system shall be a 19" rack mount type, including, polyethylene tubing, connectors, straps, and other mounting hardware as required.

The dehydrator unit shall be equipped with a pressurization monitor to detect and provide alarm contact for the following conditions: 1) low pressure below 1.5 pounds per square foot.

Dehydrator and monitor shall be 19" rack mounted and mounted two and one-half feet (2 1/2 ft) above the floor. The dehydrator shall be connected to a 120 volt, 60 Hz. power source with a standard 3 wire grounded plug.

All lines shall be purged with dry air prior to final pressurization. Transmission line leak rate shall not exceed the manufacturers published recommendations.

#### **6.9.10. Power Requirements**

The microwave radios will be powered from -48 VDC input voltages. A power panel with fuses for each microwave radio will be provided.

#### **6.10. TBN Channel Bank and Multiplex Equipment**

The multiplex equipment supplied as part of the TBN shall meet or exceed pertinent current Bell System and CCITT standards. The primary requirement for the channel bank equipment shall be to interface the 800 MHz radio equipment (DS0) to the TBN at a DS1 level. The secondary requirements shall be to provide channels for the other State Police requirements including telephone and LEIN data terminals. The type of terminating channel units required at each site shall depend on the 800 MHz radio System design. Only channel bank equipment needed to support the 800 MHz Radio System shall be provided.

##### **6.10.1. Digital Multiplex**

Motorola shall provide M13 digital multiplex; Alcatel DMX-3003n (28 DS1) and the Alcatel RDI-3100e drop and insert multiplex.

Both multiplexers have self-monitoring capabilities executed by its Control Card. The Control Card constantly monitors on-line and off-line functions. The Control Card displays failures information via an LED. Alarm and diagnostic information can also be accessed via the User System Interface (USI). The RDI can be optionally configured for Extended Link Monitor Control (ELMC). ELMC provides for diagnostic access from any ELMC equipped and connected Mux or Radio in the TBN system.

Alarm reporting shall use a serial interface. This serial interface is MCS-11.

The following line interfaces shall be provided: 1) DS1 Line Code: AMI or B8ZS strappable, 2) DS2 Line Code: B6ZS, and 3) DS-3 Line Code: B3ZS.

Alcatel DMX-3003n digital multiplexers will be employed primarily at locations that interface DS3 radios to DACS and at sites with three-way DS3 junctions. DS3 repeater sites requiring less than 8 DS1 drops, shall primarily employ the Alcatel RDI-3100e drop and insert multiplexer.

##### **6.10.2. Channel Bank Equipment**

The channel bank shall have the following capabilities and features: 1) Line rate: 1.544 Mbps, 2) Format: D4 and ESF capable, 3) Line Code: B7, B8ZS, OR AMI, 4) Provide a 64 kb/s clear channel capability, 5) Operate with the following channel units: a) FXO Channel Units, b) FXS Channel Units, c) Four (4) Wire, Data Channel Units, d) Four (4) Wire, Audio Channel Unit, 6) Support data ports of 2.4, 4.8, 9.6, 19.2, 38.4, and 56/64 kb/s, 7) Have channel unit test extenders, 8) Optional Remote diagnostic capability, 9) Power Requirements: -44 to -56 V DC or -21 to -28 V DC, 10) Shelf Dimensions: EIA 19" and 11) Environmental Operating Minimum Requirements: a) Temperature: 0° degree to 45° degrees C, b) Humidity: Up to 90 percent at 35° degrees C.

## 6.11. TBN Digital Access and Cross Connect System (DACS) Equipment

The DACS equipment shall be used to perform hubbing, circuit grooming, alternate routing, remote diagnostic and network access. The DACS equipment shall feature redundant central matrix equipment and a modular architecture. The DACS equipment shall form a hubbing network within the TBN network.

The DACS equipment shall be administered by a network control and management system located at NCC. The NCC will monitor, control and diagnose all of the DACS units in the network. The DACS shall be equipped for test access and grooming changes locally or at the NCC. The DACS shall be equipped for programming from the NCC and for circuit rerouting to provide alternate paths.

The DACS equipment shall be equipped to: 1) Groom the DS0 time slots within several DS1 signals into a smaller number of DS1s that can, in turn, be carried over the DS3 microwave link to 800 MHz zone controllers, 2) Segregates all voice channels on a separate DS1 set and data channels on another DS1 set, and 3) Provide test access for individual audio and data channels (DS0s) without using external channel banks.

The diagnostic and self-testing capabilities shall include a 24 hour report that tracks bit errors and alarms. It shall also calculate errored second and severely errored second performance quality parameters for connected DS1 circuits. The DACS shall provide automatic trouble reporting to the NCC.

Multi-level password access shall ensure that only authorized operators can alter the cross connect maps. Lower password levels shall prevent access to any operational circuits and only allow performance monitoring or allow test access of single circuits. Access shall be available both locally and remotely.

Redundant EEPROM storage of cross-connect maps shall ensure that the cross-connect configuration will be unchanged by power resets or power outages.

Synchronization inputs shall provide synchronized operation from either a local GPS Stratum 1 signal or a DS1 which can be traced back to Stratum 1. The DACS is also equipped with an internal Stratum 3 clock which provides protection during a timing input failure.

The DACS management system (DMS) shall use a "point and click" graphical interface. Complete DS1 circuits shall be viewed between different dispatch centers across multiple DACS equipment. The DACS shall provide an electronic database of all connected DS1s so that the function and routing of the DS1s can be seen without referring to paper charts.

The DMS is capable of storing multiple alternative cross-connect maps for fast DS1 rerouting in the event of a network disaster.

Minimum technical specifications for the DACS equipment shall be: 1) Port Capacity: equipped as shown in Figure 6.7 - Expandable to 128 ports. 2) DS-1 Line Interface: a) Line Rate: 1.544 Mb/s, b) DS-1 Frame Structure: D4/ESF selectable, c) DS1 Line Code: AMI/B8ZS selectable, 3) Administrative Port Interface: RS-232-C or RS-422, 4) Data Transfer Rate: Asynchronous full duplex 300, 1200, 9600 bps.

Other features and capabilities shall include: 1) Availability of DS1 and DS0 access for fault finding, 2) Error monitoring of all connected DS1s, 3) Trunk conditioning of DS0 channels used for telephone use, and 4) Digital broadcast capability allowing the connection of one complete input DS-1 to up to four output DS-1s.

Environmental operating conditions shall be: 1) Operating Temperature: 0 to 50 degrees C, 2) Relative Humidity: 5 to 95% non-condensing, 3) Power Supply: -42 to -56 V DC or -21 to -28 V DC.

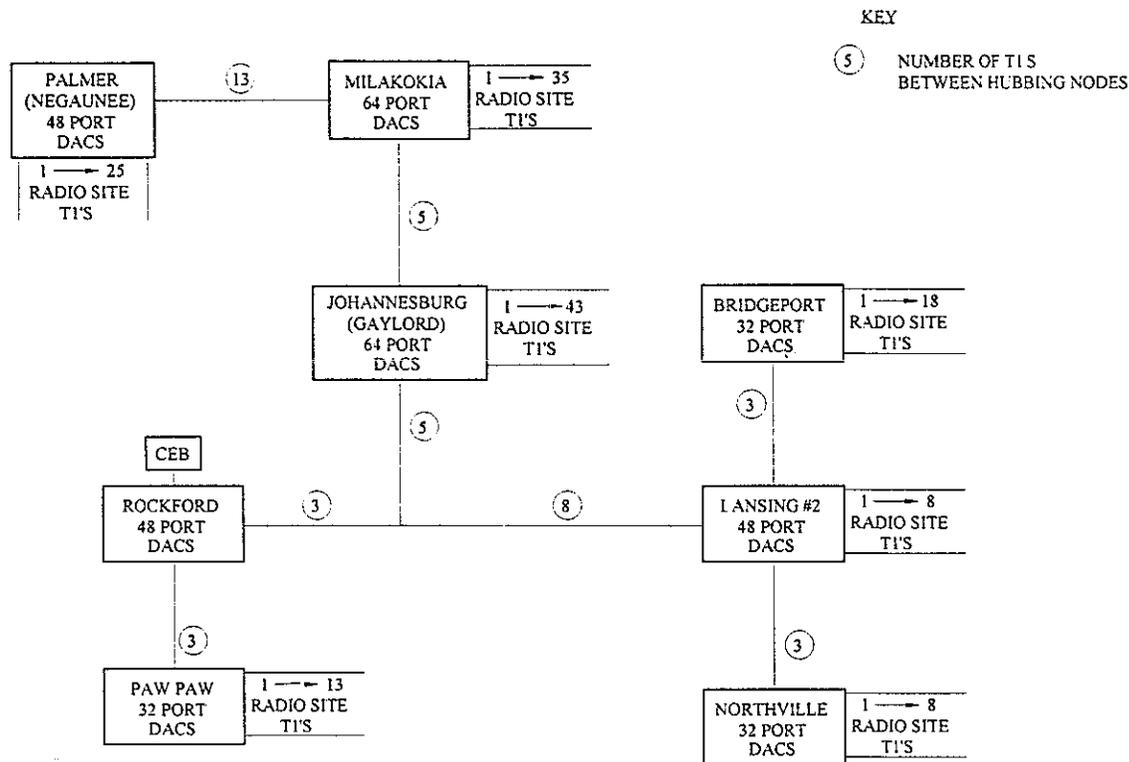


Figure 6.7 - DACS Network Diagram

## 6.12. Equipment DC Power Requirements

### 6.12.1. General

DC power for the IBN equipment is required at all sites as a standby backup system to supply load current to microwave equipment, multiplex, and alarm system, in case of main power supply failure. The standby DC supply must be a battery floating system with dual chargers to automatically equalize the batteries when discharged

Motorola shall provide a DC power supply system comprised of redundant 1+n load share chargers and maintenance-free batteries. The DC power equipment will serve as a standby back-up system to supply load current to microwave equipment, multiplex, and ancillary equipment in case of commercial AC power supply failure

The redundant 1+n chargers shall be Power Conversion Products (PCP). The maintenance-free or sealed batteries shall be the Dynasty product family from Johnson Controls

The AH provided is based on an eight-hour discharge rate. Future expansion of at least 25% shall be provided.

### 6.12.2. Batteries

Maintenance-free batteries with a nominal voltage of -48 Volts of the lead-acid Dynasty family will be provided at all sites

The Battery features shall be: 1) Advanced technology and reliable performance,

2) Rechargeable battery, recommended cycle every six months at 77 degrees F when battery has self-discharged to 80% of its capacity,

3) Wide operating temperature range, (-76 to +140) degrees F when fully charged,

4) High impact plastic case prevents corrosion and will not cause short circuit or support organic growth,

5) Series connection to obtain higher voltage, or in parallel to obtain increased capacities

Batteries, chargers, and ancillary equipment at terminal and some repeater sites of moderate AH capacity shall be installed into a EIA 19 inch rack. For sites with higher AH capacities, Motorola shall provide batteries and chargers installed in separate EIA 19" or 23" racks.

### **6.12.3. Chargers CCO#10.1**

The charger system shall be designed for Load Sharing Operation except in the circumstance of equipment load less than 10% of the combined charger capability, in which case a Hot Standby Mode may be utilized

In Load Sharing Operation, the PCP charger system will be fully redundant with two chargers operating in parallel on a load sharing basis. Each charger will be capable of supplying full load when its redundant charger fails. The charger system will simultaneously supply full load current and charge a fully discharged battery. External timers will be supplied to automatically fully charge a battery within 24 hours

In Hot Standby Mode, the PCP charger system will be fully redundant, operating with two chargers. Each charger will be capable of supplying full load current and charge a fully discharged battery. The Hot Standby Operation will take all the load off the secondary charger, except when the primary charger fails or is current limited and its voltage drops, in which case the standby rectifier will supply the full load as required. External timers will be supplied to automatically fully charge a battery within 24 hours

Charger specifications are 1) Input Voltage: 120/208/240 Volts A.C., 2) Regulation: + - 5% with 10% A.C. Line Variance, 3) Environmental Conditions - Temperature: 0 to 5 degrees Celsius and Humidity: 95% non-condensing. CCO#10.1

#### **6.12.3.1. Battery Disconnects.**

Motorola shall furnish and install a manual, visible means of disconnect (block type preferred) with enclosure to allow the battery plant to be isolated for maintenance purposes, allowing the battery chargers to supply power on a stand alone basis. Disconnect shall be rack mounted

#### **6.12.3.2. Limiting**

Charger shall be self-limiting as to load current. Charger circuitry shall be such that the charger shall not rely on blowing of fuses or opening of breakers to limit current except under short-circuit conditions. Limiting shall occur at 115% of maximum rated output.

#### **6.12.3.3. High Voltage Shutdown**

A high voltage shutdown shall be provided. Relays shall shutdown the charger when the DC voltage rises above a pre-set value

#### **6.12.3.4. Low Voltage Disconnect and Pick-up**

A low voltage disconnect on the drain side of the battery shall be furnished and installed. Disconnect functions shall be sensed and automatically controlled

#### **6.12.3.5. Alarms**

The charger / battery eliminator shall be equipped with the following alarm contacts.

High voltage alarm, adjustable from 50 to 55 volts for 48 volt charger. High voltage alarm and high voltage shutdown shall be coincident.

#### **6.13. SECTION DELETED**

- 6) In Exhibit A delete Section 7.0 NETWORK MANAGEMENT, replace sections 7.1 through 7.2.4 with the following:

## **7.0. NETWORK MANAGEMENT**

### **7.1. Network Management**

#### **7.1.1. Network Control Center**

The System shall be equipped with network management equipment for control, diagnostic and automatic alarming capabilities for the 800 MHz trunking equipment, TBN equipment, towers and shelters. Network management equipment shall be installed at the Network Control Center (NCC) site 1108, the backup NCC at site 1102 and at other sites to be identified.

The NCC will be located at 4000 Collins Road, Lansing, MI, and operated by the Michigan State Police. The MSP will be responsible for the day to day operation of the System and the coordination of the maintenance.

#### **7.1.2. District Dispatch Centers**

District Dispatch Centers (DDC) shall be equipped for monitoring and control of the System. DDC locations are listed in Exhibit A, Section 4.1.1.

### **7.2. System Management - Alarm & Control System (ACS)**

An Alarm and Control System (ACS) shall be provided for System management, which shall continuously monitor and control the 800 MHz trunking equipment, TBN equipment, shelters and towers. The ACS shall be equipped for monitoring and locating problems on all System equipment, including, but not limited to:

- 1) 800 MHz Trunking System Controllers,
- 2) 800 MHz Trunking System Packet Switch Network,
- 3) 800 MHz Audio Switching Equipment,
- 4) 800 MHz Central Electronics Bank Console Equipment,
- 5) 800 MHz Site Control Equipment,
- 6) 800 MHz RF Repeater Equipment,
- 7) 800 MHz Antenna System Equipment,
- 8) TBN Microwave Radio Equipment,
- 9) TBN DACS Equipment,
- 10) Multiplex and Channel Bank Equipment,
- 11) Shelter Environmental Equipment,
- 12) Shelter Security Equipment,
- 13) Shelter Electrical Equipment, and
- 14) Tower Lighting Equipment

The ACS shall employ a self-healing feature to ensure that alarms are always received by rerouting alarms to redundant computers at other locations. Equipment alarms shall be a relay contact, an analog voltage, or 8-bit word (ASCII-based) serial protocol. Any failure of the ACS shall not inhibit 800 MHz equipment operation. All alarms that are detected and identified as associated with the microwave radio sites will be reported to all graphic work stations. ACS shall include password access control and data hand-off to a trouble ticket system. The State will define the information to be handed off from the ACS to the trouble ticket system. Motorola shall provide the format and the details of the physical handoff to the State. MSP will coordinate the integration of the third party software and the ACS data.

The ACS software shall be based on industry standard platforms including but not limited to 1) MS Windows NT 2) Intouch Wonderware. The ACS hardware shall utilize standard computing processors, such as Intel Pentium and Motorola 68302 or later versions of each.

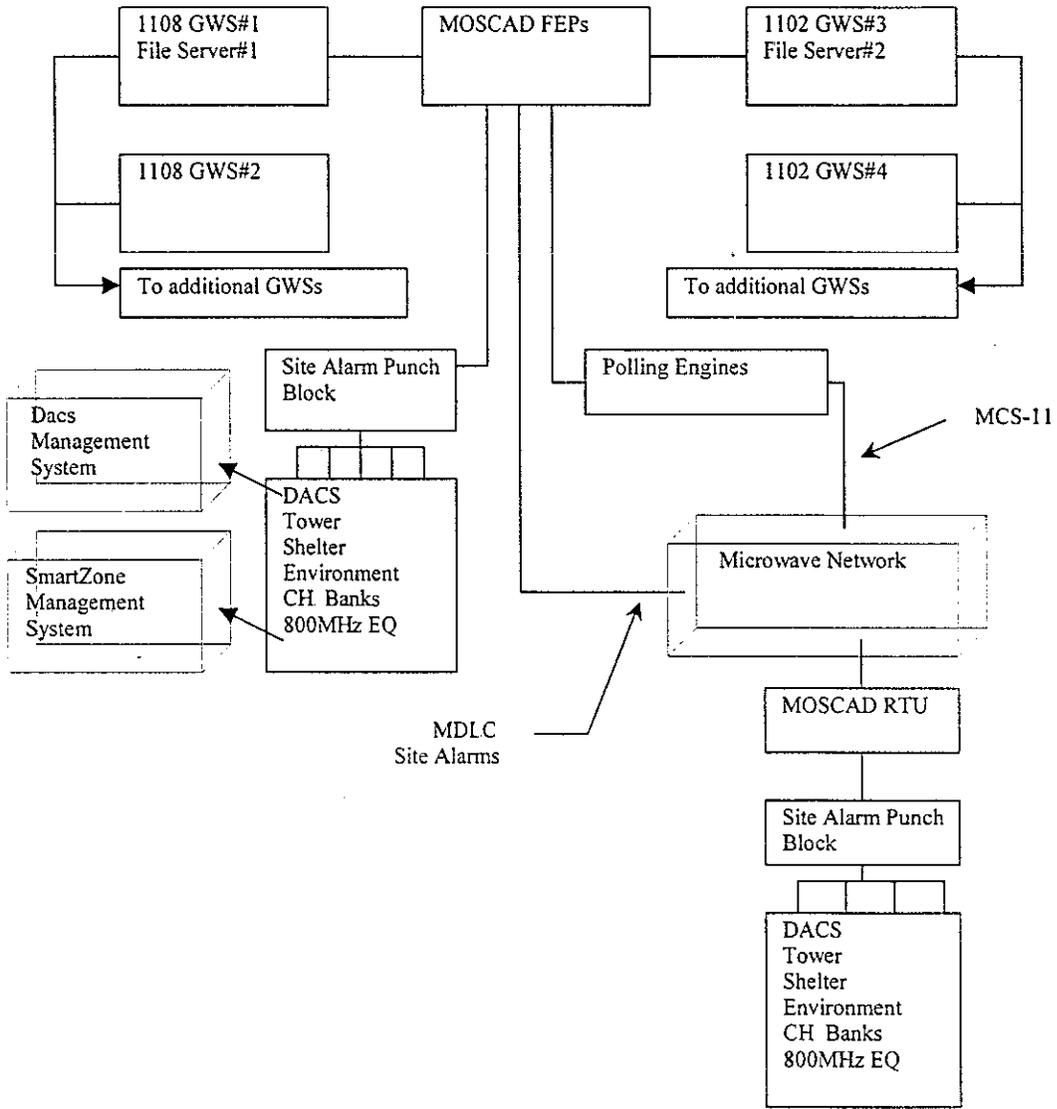


Figure 7.1 - System Network Management Diagram

### 7.2.1. ACS Hardware

The ACS shall consist of four master stations with a total of eight Graphic Work Stations (GWS). The master stations shall be located at the NCC (1108), 1102 and other locations.

The master stations shall be interconnected via common network communications channels. The network communications channel shall utilize the radio service channel or a DS0 or both. The network shall be divided into segments.

The system elements of the master stations are:

- Database File Server (FS): The FS shall be a software function provided within the primary Graphic Work Station (GWS) computer at each master location to allow parallel processing of system alarms

Each File Server shall contain a RocketPort. The RocketPort shall consist of a communications card and I/O adapter cables. It shall provide 16 physical high-speed RS-232 connection ports into the file server computer and manage the communications functions for up to 32 serial devices locally. The RocketPort shall allow multiple data communications links without requiring a separate computer for each multiple of four serial ports supported by Windows NT. In the MPSCS the data links include the MCS-11 polling engines, MOSCAD FEP modules, and wireline modems for dial-in access and paging

- Graphic Work Stations (GWS): The GWS provides alarm network administration and monitoring functions.
- The GWS hardware shall consist of a platform that as a minimum provides the following :
  - Pentium Pro computer with a 300 MHz processor, 128 Mbytes RAM, 4 GB hard drive, 32X CD-ROM drive, 100 MB ZIP drive, and monitor.

The four master stations shall be connected to the ACS network via separate serial data links. The master stations shall be connected to the FEP(s). The FEP(s) will then communicate with the MCS-11 polling engine(s) and the RTU(s) in the associated segment.

All of the Remote Terminal Units (RTU) and MCS-11 devices that are employed to monitor alarm and status shall be connected to its associated ACS network segment and channel.

The Graphics Work Stations (GWS) at the NCC facilities, File Servers (FS), Front-End Processors (FEP) and Polling Engines (PE), microwave radios and Remote Terminal Units (RTU), constitute the skeleton of the ACS.

#### **7.2.1.1. ACS Master Station Equipment**

The ACS Master Station shall consist of an InTouch Windows NT File Server (FS), and InTouch Windows NT Client Graphic Work Stations (GWS) The Master Stations shall operate in the multi-master mode. The File Servers shall be connected to the MOSCAD and MCS-11 FEPs, and the GWSs shall access alarm information through the local network connection

The FEP is a MOSCAD CPU with an application specific software package installed. The FEP is dedicated to RTU and polling engine interrogation, storing and routing of status messages and local I/O module processing (site alarms and controls). Data acquired through periodic polling and real-time alarm reporting of COS conditions is stored in the FEP's resident database. The operator sends commands, which are required for control functions, from the GWS through the FEP to a designated RTU or polling engine. A single FEP module can control an MCS-11 polling engine (127 MCS-11 device addresses) or up to 32,000 MOSCAD RTU addresses

All display monitors within the ACS shall be 1024 x 768 Super VGA 17" color monitors.

#### **7.2.1.2 ACS Remote Site (MOSCAD) Equipment**

Each site shall have an intelligent Remote Terminal Unit (RTU). The RTU shall collect and report: alarms and status conditions to the master stations. The RTU shall also be capable of dry contact output controls. The data communications speed shall be at least 2400 Bps. The minimum number of alarms shall be 32 inputs and 8 digital control outputs. Sites with a Zone Controller shall be provided with additional alarm or control expansion modules. Sites required to monitor other devices such as QUANTAR stations, Trak® time standards, or Premisys™ channel banks shall be equipped with the appropriate additional modules

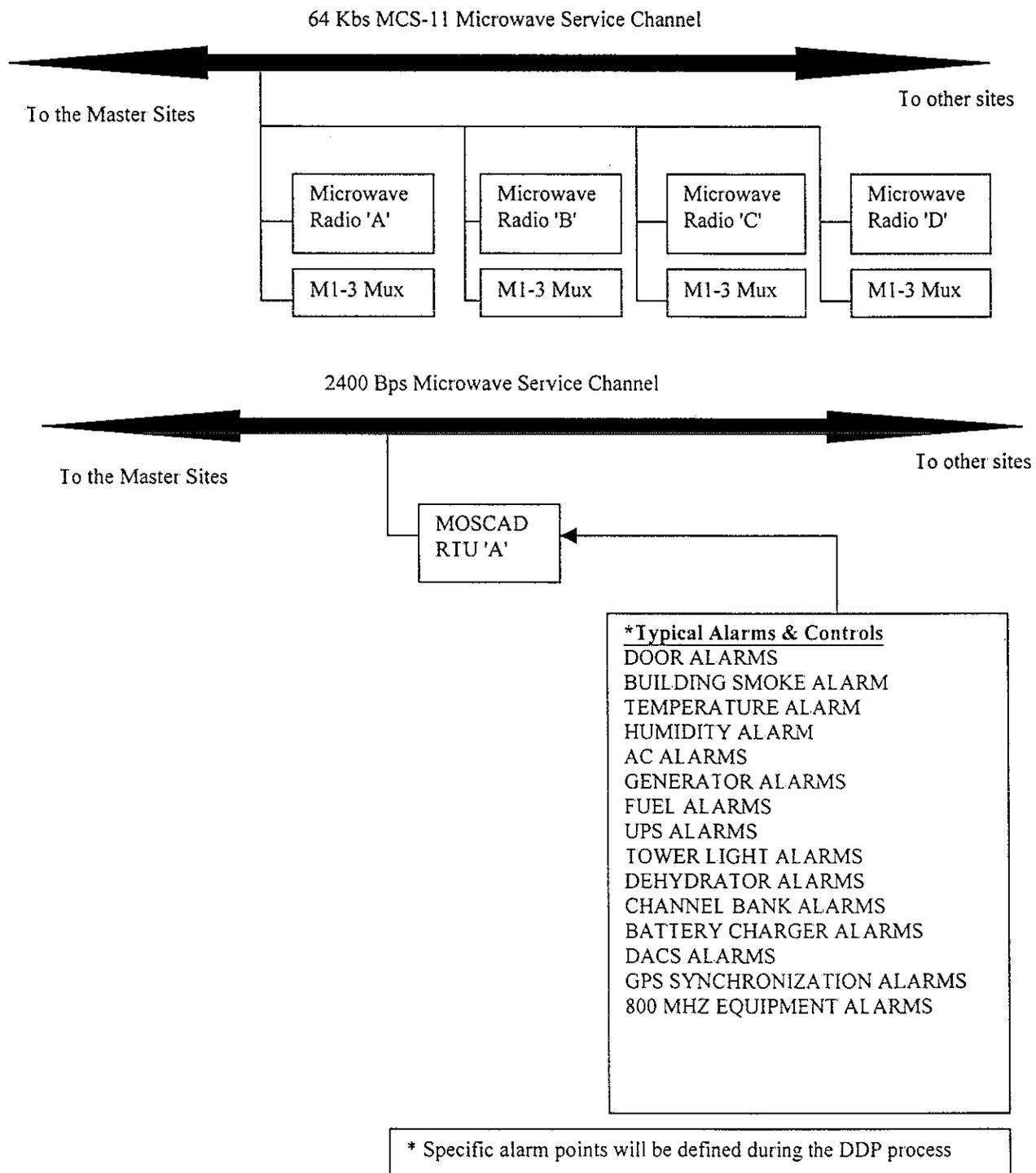


Figure 7.2 - Typical Alarms collected and reported

### **7.2.1.3 ACS Microwave Radio (MCS-11) Equipment**

MCS-11 polling engines will provide the conversion of alarm and control information from the microwave radio overhead to the MOSCAD FEP. The MCS-11 Polling Engine (PE) units shall continuously poll their associated Alcatel microwave radios and digital multiplex for status and alarm information. The alarms monitored in each radio and multiplexer are defined as Remote Detail Scanners, Remote Analog Scanner, & Remote Station Scanner (RSS) Control functionality will be processed through Remote Control Decoder (RCD) scanners. The State of Michigan system design will utilize several segments of digital service channels to poll all of the MCS-11 devices in the system.

### **7.2.1.4 ACS Communications Functions**

Each site's MOSCAD Remote Terminal Unit (RTU) will collect and report alarms and status conditions of the physical and environmental status to the Master Stations. The communications interface ports of the RTUs and Master Stations shall be asynchronous serial RS-232. Data will be transported on the microwave radio overhead. Channels and segments that do not terminate at site 1102 will be isolated and brought back to site 1102 through SRU ports within various independent DS0 data streams.

The MOSCAD interface to the Alcatel MCS-11 data is accomplished with a Polling Engine. The Polling Engine continuously interrogates the Alcatel microwave radios and multiplex units in sequence. The Polling Engine acts as a protocol converter between MCS-11 (Alcatel devices) and MDLC (MOSCAD CPUs). The completed system shall be configured so that each segment's polling engine (primary engine) has a redundant polling engine (secondary). The MCS-11 data shall be brought back through an integral 64 Kbs overhead service channel found on all of the Alcatel radios provided. The MCS-11 data is synchronous serial data. The polling engine shall clock data out on the MCS-11 side at 64 Kbs with an RS-422 interface and 9.6 Kbs with an RS-232 interface on the MOSCAD side.

### **7.2.2 ACS Functional Requirements**

The ACS shall, at a minimum, perform the following tasks:

- 1 Monitor hardware and physical alarms
- 2 Report the TBN system status
- 3 Allow for troubleshooting of TBN elements and system fault analysis
- 4 Provide real-time and historical performance for monitoring and analysis
- 5 Provide remote preventative maintenance
- 6 Store alarm event data
- 7 Provide remote control capability

### 7.2.2.1. ACS Functions

Four (4) ACS File Server (FS) computers shall be provided. The ACS system shall be configured to periodically poll the complete network. The periodic poll rate shall be field adjustable. The ACS FEPs and Polling engines shall be distributed by segment throughout the system. This shall allow for continued operation during a system failure on the network backbone. Wherever possible the ACS shall be configured to support continued ACS operation to include alarm reporting and control during a single backbone failure on the network. This shall be accomplished by the use of redundant FEPs, Polling engines and multiple circuits between the master location and the redundant equipment as necessary. The ACS shall be configured so that during a local master failure the remote master locations shall continue to receive alarm information without interruption.

The MOSCAD FEP collects, stores, and distributes real-time data acquisition information to and from the RTUs and PEs. The File Server (FS) receives and stores data from the FEPs so that it is available to the users. The Graphic Work Stations (GWSs) display information from each site and microwave device. The interface to the Alcatel MCS-11 alarm channel is accomplished with a separate unit known as the Polling Engine. The Polling Engine computer continuously interrogates the microwave radios in sequence, and translates information from one digital message format to the other. On one side, the Polling Engine provides MCS-11 protocol emulation and an RS-422 interface to the radio. On the other side it provides an RS232 interface to a MOSCAD CPU.

Data relating to RTUs and MCS-11 devices is loaded into the database in the corresponding FEP module. The operator sends control functions from the GWS through the FEP to a designated RTU or MCS-11 device. If communications with the site is lost, the master will be updated to the current status when the communication link is restored. Communications failures will be displayed on the GWSs.

Each FEP will have 1 ModBus port for each File Server. ModBus is the protocol that allows the FEP to pass all data to the FSs. When a COS occurs, the RTU will report the new site information to the FEP, the FEP will store the data in its database, and ModBus will report the new information to the File Servers. The Graphic Work Stations at each master site will acquire the new data via the local network connection.

The MOSCAD ACS shall include the software module WIN-911™ or equivalent for alphanumeric alarm paging. The software shall provide for automatic alerting of specific technicians depending on the alarm location and/or type.

The ACS shall be segmented as needed to allow for sufficient address availability and message response times. Loading on each segment shall be designed so that a system COS report rate of 10% will allow all alarm messages to be displayed on all GWSs within 62 seconds.

The ACS shall also be equipped with an interrogation function. When an interrogation is initiated the interrogated RTU will update the system with its current alarm status. Selective interrogation of any site shall occur without interrupting the monitoring of the remaining network. This feature shall ensure that a Change Of State COS is not missed while the master is used to interrogate a specific site.

Direct scanning of alarm points for closure/no closure shall be provided. Troubleshooting is accomplished by direct scanning of alarm points and control activity. Additionally, the system shall provide for control activation/de-activation commands to switch or adjust network elements and verify operational capability.

The FEP shall maintain a real time clock, which is periodically downloaded to the remote terminals, and the File Servers at software selected intervals to ensure that all time and date stamps are synchronized. The MOSCAD ACS shall be designed to provide synchronization of time between all master locations; file servers and GWSs. At site 1102 the TRAK® GPS timing source shall be connected to a MOSCAD CPU module in the FEP rack. The TRAK® unit shall provide GPS time synchronization for the MOSCAD network. Synchronization data shall then be broadcast periodically to all of the other MOSCAD CPU modules at site 1102. The RTUs shall be updated periodically by their associated CPU's. The File Servers and GWS clocks shall be updated periodically by their associated CPU. UTC time and MOSCAD network time shall be synchronized to within 7 seconds under normal conditions. The alarm time stamp shall be performed upon receipt of the message at the file servers.

The ACS Master Stations shall be equipped to allow remote dial-in access to the ACS for accessing the COS history files. A personal computer configured with the In-Touch run-time software program shall be capable of accessing the File Server Work Station as long as the remote user has been assigned remote dial-in privileges and a valid password. The MOSCAD CPU modules shall be configured so that they can be downloaded with new template or file information directly from the GWS.

The ACS shall be capable of interfacing with Umbrella Network Management. SNMP shall be available, this will allow for future connectivity to other MPSCS network management platforms. All control operations shall be under password or user name and privilege control as defined by the administrator.

The system shall identify and report Severely Error Seconds (SES) on each microwave path. Collection of the SES information shall be performed by circuitry within the Alcatel microwave radio. This shall allow the radio to count and store up to 255 SESs in each polling cycle.

#### **7.2.3. ACS Remote Station (RTU) Functions**

The MOSCAD RTU shall monitor status changes from an on/off (Bi-State) alarm input and report these to the master station. It shall also be capable of monitoring analog inputs and sending both high/low thresholds and actual analog values, and/or accepting serial data from various sources over asynchronous RS232 or RS485 links, if specifically equipped with the appropriate modules and software.

The Control relays can be operated automatically and without master station intervention by using locally stored ladder logic consisting of specific alarm point conditions.

The MCS-11 remote equipment shall be capable of reporting alarms, status conditions and analog readings. It shall also provide for the control operation of the associated MCS-11 device. The MCS-11 devices shall be the M1-3 multiplexers and the microwave radios.

#### **7.2.4. ACS Master GWS User Functions**

The GWS shall allow personnel to monitor and control the ACS. The GWS operates controls on a point and click basis. Alarm notifications and alarm priority levels shall be represented by various alarm color changes and an audible alert provided by the PC. The GWS shall utilize four levels of window categories:

- 1) Network Layout - Shall include the icons, which represent each specific region within the system.
- 2) Region Layout - Shall include an icon representing each unique site within the region. It shall also display communications routing (path) from one site to another site within the specific region.
- 3) Site Layout - Shall include one tab per device at the site. These shall include digital inputs, digital outputs, MCS-11 devices, and other serial communications devices.
- 4) Device Layout - Shall include one text line per alarm point for the device that is being viewed.

The Network level and Region level maps shall be vector based. These maps shall be drawn by Motorola in a bitmap format and imported into the ACS. The window for the Site level and Device level will be created by Motorola and can be edited on the GWS by the user. Additionally, a map editor shall be provided for GWS configuration. It shall allow the user to define and select regions, define icons, place and select sites, place device icons, and place and define alarm icons

Dial up access shall be available using a PC configured with the In Touch and Toolbox software. Password levels on the GWS and the dial-in port will control access. The ACS shall use a multi-user operating system (Windows NT), so that the dial-in remote operation shall not interrupt alarm monitoring of the network.

All alarms shall be displayed graphically and in plain English text in a separate window on all of the GWSs. In addition any and all alarms shall be printed when selected using the report writer.

#### **7.2.4.1 Network (State of Michigan) Level**

The opening color display screen on the GWS at this level shall be an outline of the State of Michigan showing the borders of the regions. The Network level window map shall display locations monitored on a regional basis. Each region shall be represented by an icon.

When an alarm occurs, the specific region icon shall change colors to indicate which region has an alarm. The operator will click the region icon to open the Region window

#### **7.2.4.2 Region Level**

The display on the GWS at this level shall be the outline of the particular region selected by the operator, with a labeled icon reflecting each site being monitored. Within the Region level window, when an alarm occurs the specific site icon shall change colors and indicate the site where an alarm has occurred. The operator will click on the site icon to open the Site level window

#### **7.2.4.3 Site Level**

The Site level window shall show individual alarm points and equipment at each site. 32 bi-state alarm points shall be displayed within this window. Tabs shall be provided to navigate to specific MCS-11 devices or the 16 control points. The tabs shall flash to indicate where a specific alarm has occurred

#### **7.2.4.4 Device Level**

The Device level window shall be the lowest level. It shall display the status and control points within the associated device. One text line per alarm shall be displayed and shall be user created to reflect the alarm type. When an alarm occurs, the specific alarm text shall change colors. This may reflect not only the circuit that has an alarm, but also the priority level of the alarm. See Figures 7.2.4.4a and 7.2.4.4b for color descriptions.

COLOR	ACTION	INDICATION
Green	On	Normal Condition
Green	Flashing	Unacknowledged Return to Normal Condition
Red	On	Acknowledged Service Affecting Alarm
Red	Flashing	Unacknowledged Service Affecting Alarm
Yellow	On	Status Indication Change

**Figure 7.2.4.4a MOSCAD Alarm Point Color Matrix**

COLOR	ACTION	INDICATION
Red	On	Unacknowledged Active Alarm
Blue	On	Unacknowledged inactive Alarm
Orange	On	Acknowledged Active Alarm

**Figure 7.2.4.4b MOSCAD Text Color Matrix**

#### 7.2.4.5 Comm Screen

The Communications Screen shall display the status of data flow between the ACS elements. It shall have three tabs to allow navigation to the following areas of further detail:

- The MDLC tab shall display the system MOSCAD CPU configuration;
- The MCS-11 tab shall display a list of all sites with MCS-11 equipment;
- The System tab shall show all ModBus connections to GMC File Server facilities.

#### 7.2.4.6 Alarm Summary Screen

The Alarm Summary Screen shall include a button to toggle between the two available alarm lists. The Alarm History list shall display all alarms since the last system boot, up to a limit of 150,000 alarm messages. These shall be displayed in different colors to indicate the status of each specific entry. The Alarm Summary list shall show only the active alarms in red. The Alarm Summary shall also be able to appear as a floating window to give the operator a continuous view of recent open alarms.

#### 7.2.4.7 ACS Reports

There shall be a variety of reports available to operators on system and alarm point status. Available reports shall include: 1) History Log (150,000 events or 31 days), 2) Channel Status, 3) Station Status, 4) Standing Alarms and 5) Control Status. The five alarm reports allow performance monitoring of the System. Real-Time Alarm Status will be made available through the Graphics Central alarm summary screen.

Custom reports shall be available at anytime to the operator. Reports shall be generated from each GWS without disabling network monitoring, thus ensuring that COSs are not missed. Reports shall also be customized from any of the GWSs. The reports shall be generated from a Microsoft Access database. A Visual Basic interface will allow the user to create a customized report by using a series of drop-down lists and check boxes. These lists and boxes shall include date, device type, site number, alarm state in any combination to include SESSs. The File Server at each master ACS site will store the Access database. All other GWSs at a site will utilize the database via the local network connection.

- 7) In Exhibit A, Section 2.11 Repeaters, delete the sixth paragraph and replace it with the following:

The system shall provide a power monitoring device at each Site to monitor transmit power and reflected power. The power monitoring system shall consist of a portable power meter which plugs into power sensors via a shielded phono cable. The following shall be measured; transmitter power output, combiner loss, antenna forward and reflected power.

The meter shall calculate and display SWR, insertion loss and battery voltage. Any RF power combination shall be viewed simultaneously on the digital LCD. The meter shall be powered from a standard 9v battery and a low battery indicator is provided. The meter shall be connected by a standard shielded phono cable which allows it to be moved around the site. A 30 foot cable shall be provided so that the display can be viewed while adjustments are made at distant monitoring points.

Two types of power sensor shall provided; a low power bidirectional type for base station power output, and a high power bidirectional type for antenna input. The sensors shall use N-male input and N-female output connectors. This connector arrangement shall allow for replacement or bypass for fault isolation.

- 8) In Exhibit A, Section 2.12 Antenna Network, delete the last sentence of the first paragraph. Append Section 2.12 with the following:

The mutual aid system shall utilize the trunked receive multicoupler for its receive antenna system and the trunking transmitter combining system or a dedicated antenna for its transmit antenna system. The transmit antenna requirements shall be based on site frequency allocation and combiner channel spacing at a given Site.

- 9) In Exhibit A, Section 5.3 Location of Mutual Aid Calling Channel Repeaters, delete the second sentence and replace with the following:

The mutual aid station shall utilize the trunking transmitter combining system or a dedicated antenna for its transmit antenna system.

- 10) In Exhibit K of the Phase 2 DDP, add the following additional services:

Special Request for Services:

1. Site 6104 Ada Township - Mobilization of specialized equipment to facilitate the State's request to expedite the unscheduled excavation (drilling) and installation of re-enforced concrete foundations for the 475' self-supporting communication tower, per the approved design.

COST TO PROVIDE THE REQUESTED SERVICES:

\$15,000.00 based on 50 / 50 split between Motorola Inc and the Department of State Police, State of Michigan  
(Per copy of Emergency Radio Services Invoice)

- 11) In Section 1.35.4 State Responsibilities, of the Terms and Conditions, paragraph B, replace subparagraph 2 with the following:

B.

- 2 Motorola shall be allowed to perform site development work, as defined in Exhibit A, Section 8.3 and Exhibit B, Section 1.8.3, on private and State-owned Sites prior to the issuance of a Contract Release. The State Project Director shall issue a Notice to Begin Site Development letter which lists the specific Sites authorized for this activity. This authorization to begin site development activities early shall terminate upon the issuance of a Contract Release which identifies the Sites specified in the System Design. In the event that a Site on which site development work commenced, is abandoned, the actual direct costs (excluding lost profit) incurred for the site development work completed as of the date of abandonment shall be allocated as follows:

- 12) In Section 1.35.7, delete paragraph A and replace with the following

**1.35.7. Option Procedure for Privately Owned Alternate Sites**

- A. If a proposed privately-owned Alternate Site or Alternate Sites is/are preliminary acceptable to the State, the State, or its agent, shall promptly cause contact with the owner or owners of such privately-owned Alternate Site or Alternate Sites. If the owner or owners express an interest in the sale of such privately-owned Alternate Site or Alternate Sites, the State shall prepare a proposed option agreement for each Alternate Site utilizing the form of the option agreement agreed upon by the Parties.

- 13) Delete Section 1.35.8, delete paragraph A and replace with the following, and correct paragraph identification by replacing the duplicated B and C with D and E

**1.35.8. Site Acquisition Requirements**

- A. Sites submitted to the State by local government authorities pursuant to 1996 PA 538 shall be reviewed by the State and Motorola for equivalence to the State approved site. If the State determines the PA 538 site is equivalent to the State approved site, the PA 538 site will be substituted for the State approved site. Costs for abandoning the State approved site shall be apportioned as described in Section 1.35.10.B.
- D. In all instances, the State shall be responsible for all costs related to Stage 1 environmental investigations, and any further environmental investigations, reviews and studies that the State may direct to be performed ("Environmental Study Costs") for all Sites, whether such Sites are State-owned or privately-owned and whether such Sites are Baseline Sites or Alternate Sites.
- E. The State shall be responsible for all costs for Surveys ("Survey Costs". Motorola shall be responsible for all costs for soil compaction tests ("Soil Testing Costs") for all Sites, whether such Sites are State-owned or privately-owned and whether such Sites are Baseline Sites or Alternate Sites.

14) In Section 1.35.11. Construction Permit Applications, of the Terms and Conditions, delete paragraph A and replace with the following:

A. Motorola shall submit, in the name of the State, three (3) copies of a single application for plan examination for multiple Sites to the Michigan Department of Consumer & Industry Services, Bureau of Construction Codes ("BOCC"), on the form prescribed by the BOCC, accompanied by copies of the applicable Site Application submitted to the Site Representative, together with such additional Site-specific information and technical data as may be required to permit BOCC to perform its review and approval functions and together with the applicable fee remitted by the State. These submittals shall be made simultaneously with the publication of the DDP for the particular phase. It shall be sufficient if Motorola submits a single set of Shelter data and designs specified in Exhibit B, or as required by the BOCC, provided that Motorola shall indicate any Site-specific variations from the standardized data and design for each Tower and Shelter. BOCC shall issue Site-specific permits which shall be obtained by the Motorola subcontractors prior to construction

15) In Exhibit B - Section 1.8 Documentation; Sub-Section 1.8.1.2 Submittal Schedule, in figure 2.4.3a, modifications have been made to items 4, 25, 31, and 32, and item 29 was deleted

1.8 Documentation

1.8.1.2 Submittal Schedule

Figure 2.4.3a Schedule of items to be submitted by Motorola

Item	Activity	Maximum Days (Calendar) to Complete Activity	Document Type
1	Key sheet or index sheet listing of all drawings and descriptive literature which will be subsequently submitted Phase System Manual Outline	Developed as part of the DDR process.	I
2	Applicable System planners, programming database templates instruction manuals, operational manuals, data and specification sheets, etc. that fully describe all operational aspects of the System Based on upgrades or new equipment as required by changes or additions this information will be provided as these upgrades, changes or additions take place through-out the term of the contract.	Developed as part of the DDR process.	I
3	System interconnection and operational block and level diagrams covering system function & signal flow, as may be necessary to understand the overall operation of the equipment being furnished.	Developed as part of the DDR process	I
4	Channelization Plan for TBN to include DS3, DS1 and DS0 tables based on accepted System design at contract signing. Channelization plans will be modified and supplied on a phase by phase basis to incorporate changes as required.	Forty-five days after Contract Release for each Phase	I
5	Rack profiles showing rack dimensions on all equipment units and their location in the rack.	Forty-five days after Contract Release for each phase	I
6	Console layouts in plan and elevation views, CRT screen templates, and control window templates so that the functionality and operation can be fully understood.	Developed as part of the DDR process	I
7	Building modifications, equipment room layouts and dispatch centers	Ninety days after Contract Release for each phase	A
8	Wiring harness drawings or cable running lists for all intra-rack wiring This shall include all plug-in shelf assemblies, showing wiring connections between a shelf. Typical Site configurations will be provided for 4 channel remote sites, 6 channel remote sites, microwave repeater sites, district dispatch centers, individual configurations for zone controller locations and the Network Control Center.	Ninety days after Contract Release for each Phase	I
9	Fleet/subfleet plan.	Sixty 60 days prior to the scheduled Factory Test for Phase-I	A
10	Final Site layouts for Tower, Shelter, fencing, and grounding.	At the DDP	A

11	Final equipment layout for each type of equipment Shelter	At the DDP	A
12	Final Console layouts in plan and elevation views, CRT screen templates, and control window templates.	At the DDP	A
13	FAA submittals	Developed as part of the DDR process	I
14	Utility Site connection description and typical Site plan drawings shall be provided.	Developed as part of the DDR process	I
15	Detailed Site connection requirements shall be provided based on an application for service and the utility companies engineered plans for each Site.	Fifteen days prior to connection of a given Site	I
16	Acceptance Test Plan to include forms, tables, procedures, equipment and coverage grids Documentation shall include all tests included in Exhibit C Testing and Acceptance.	For factory test plan 45 days prior to scheduled test dates for each phase For all field test 45 prior to scheduled test dates for each phase.	A
17	User Cutover plan as described in Section 1 6 2 of Exhibit B Statement of Work.	At the DDP	A
18	Final RF propagation maps showing guaranteed 97% area coverage.	Provided as part of the DDR plan for each Phase.	D
19	Test Plan Results	30 days after completion of the tests.	I
20	RF levels on a per Site basis from the results of the optimization process	15 days prior to the acceptance milestone of the last district in each phase.	D
21	Audio Levels on a per Site basis from the results of the optimization process	15 days prior to the acceptance milestone of the last district in each phase.	D
22	Test Checklist and Project Punchlist	At the conclusion of each phase acceptance.	D
23	Propagation tests results as described in Exhibit C Testing and Acceptance.	15 days prior to the district acceptance milestone.	D
24	Installed firmware and Software options used in control of the System. All jumper settings associated with controllers.	30 days after achievement of Phase Acceptance Test milestone.	D
25	Existing equipment maintenance manuals, including schematic diagrams and all auxiliary equipment manufactured by others Quantities and distribution is outlined in Section 1 7 2 2 1 and 1.7.2.2.2.	At Specification Testing, as scheduled for a given District	D
26	As-builts drawings (paper and electronic) for all equipment provided for the System, equipment inventory list	As a precedence to achieving Final Phase Acceptance Milestone and Statewide System Acceptance Milestone.	D
27	FCC Licenses Applications	Sixty days after Contract Release for each Phase.	A
28	Preventative Maintenance Schedule	Sixty days prior to warranty start for each phase.	I
29	Mobile Installation Schedule	Sixty days prior to the scheduled Phase Acceptance Milestone Date.	A
30	Detailed Design Review Process and Plan Publication (DDP)	Sixty Days after Site Lock is achieved for all Sites required for a given Phase	A
31	Programming Templates for Mobile and Portable radio Programming.	Sixty days prior to the scheduled Phase Acceptance Milestone Date.	A
32	Propagation Predictions for portables (worst case) at 27 sites selected by the State Distribution of sites: Phase 1 - 9 ; Phase 2 & 3 - 9 each ; Phase 4 - 9	At the DDP	D

LEGEND: I - Informational A - Approval D - Documentation

- 16) In Section 1.1 of the terms and Conditions add the following item 63

Contract Terms and Conditions:

1.1 Definitions:

63. Site Lock: Shall mean for site design reasons, that the site or sites are considered acceptable for inclusion in the applicable Detailed Design Plan. Site Lock shall be considered complete when all of the following requirements have been met.

- Signed Option / State Department Approval with the Right to Construct prior to closing.
- PA 538 notification has expired.
- Wetland Studies have been completed and designated as a non-issue by both Parties.
- Environmental Studies have been completed and designated as a non-issue by both Parties.
- Topographic / Boundary Surveys have been completed.
- 800 MHz and Microwave frequencies have been coordinated.
- All Regulatory Approvals have been received, excluding FCC licensing.

- 17) In Section 1.3.3 Channel Operation, Exhibit A System Description and Specifications, in the first sentence of the third paragraph delete "unless busy override is involved."

- 18) In Section 2.3. Statewide Operation, Exhibit A System Description and Specifications, replace the last five paragraphs with the following:

As the number of sites required for a call increases, the probability of that call being queued also increases. To help process these calls more efficiently, the System shall have these features:

**FastStart** - FastStart is a talkgroup setting that requests a group call setup whether or not all affiliated talkgroup members are available. This call setup method still requires the participation of all affiliated consoles and critical resources before the call can begin. As channels at the affiliated talkgroup members' sites become available they are added to the call in progress.

**AllStart** - AllStart is a talkgroup setting that requires all sites with affiliated talkgroup members and other required resources be available before the call begins, otherwise, the System returns a busy response to the subscriber that initiated the talkgroup call. Once the required resources become available, the call is granted.

**Critical Site** - This feature provides manager control for FastStart call processing. For talkgroups configured for FastStart operation, the system manager may designate any site or sites in the System as critical. The System will then require that the critical sites be included in order for the talkgroup call to begin.

These three features are included in the System, and provide the ability to process wide-area calls more quickly. All three features shall be programmable from the TMS terminals on a talkgroup basis.

19) In Section 2.7. Call Functions, Exhibit A System Description and Specifications, make the following changes:

Item 13) Dynamic Site Assignment: Mandatory Sites for Busy Override; replace with the following:

13) Dynamic Site Assignment: Mandatory Sites for FastStart Talkgroups - Mandatory Sites for FastStart talkgroups shall specify which sites or subsystems are required to participate in a talkgroup or multigroup call if the System issues a busy for a FastStart talkgroup. This shall allow a call to be assigned with all the mandatory sites and Site of origin but not necessarily all the sites where talkgroup members are affiliated.

Item 14) Dynamic Site Assignment: Mandatory User (Busy Override); delete this item.

Item 15) Dynamic Site Assignment: Pre-Empt Capable User; delete this item.

20) In Section 1.3. 800 MHz Testing and Acceptance, Exhibit C Testing and Acceptance, make the following changes:

Item 13) Dynamic Site Assignment: Mandatory Sites for Busy Override; delete item.

Item 14) Dynamic Site Assignment: Mandatory User (Busy Override); delete item.

Item 21) Private Call II - Console; modify to read 21) Enhanced Private Call - Console

Item 28) Private Call II - Site Trunking Mode; modify to read 28) Enhanced Private Call - Site Trunking Mode

Item 38) Call alert - TMS Terminal; delete item

21) The above changes have caused an impact on the contract price. Therefore the revised High Level Summary of Exhibit K, is included as part of this Contract Change Notice.

22.) All other terms and conditions shall remain unchanged.

---

---

**THE STATE OF MICHIGAN**

**MOTOROLA, INC.**

d/b/a Motorola Communications & Electronics, Inc.

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

# STATE OF MICHIGAN APC CODES

SECTION	CATEGORY	MODEL DESCRIPTION	PRODUCT CODES (APC)	DISC. %
1.0	MOBILE RADIOS	SPECTRA VHF UHF & ACCS	624, 671	28%
		SPECTRA 800 900	407, 270, 276, 581	
			566,604,270, 617	16%
		ASTRO SPECTRA & ACCS	374,761,276,412	15%
		MCS2000 CONV/TRD ALL	623, 722	15%
		LCS2000	760, 619,807,821	15%
		SPECTRA MOTORCYCLE		
		SMTNET SMTZONE	581, 270	16%
		SPECTRA MOTORCYCLE	624	28%
		SPECTRA DESKTOP	418,581,276,510,	16%
			514,518	16%
		VEH RPTR SYS (VRS)	287	15%
		SECURE PORTABLE		
		REPEATER	570	5%
		MARATRAC	776	18%
		MAXTRAC 100 & 300	428,189	28%
		MAXTRAC PRIVACY PLUS	436,438,481,536	17%
		DESKTRAC REPEATER	154	16%
		BASE INTERFACE	351	15%
GTX	867	15%		
1.1	MOBILE ACCESSORY.	ANTENNAS	644,555,455	15%
2.0	FIXED STATIONS	NUCLEUS	711	15%
		SIMULCAST CONTROLLER	335	5%
		MTR2000	512	15%
		QUANTAR,QUANTRO	537,301,509,409	19%
			448,482,225,360,	19%
			225,360,590,675,	19%
		676,218,301,	19%	
2.1	MICROWAVE	BATTERY CHARGERS	207	5%
2.2	FIXED STATION ACCESSORIES	ALL ITEMS	207,274,201,740	5%
			351,708,273	
2.3	FIXED STATION CONTROLS	COMMAND SERIES	740	16%
		COMTEGRA	322	15%
		COMMAND PLUS	740,129	16%
		CENTRALINK	118	5%
		COMMAND STAR	124	15%
		CENTRACOM GOLD	404,202 228	21%
		CONTROL MODULES	228,244	21%
		FLASHPORT	729	0%
		FURNITURE	202,229,708	5%

# STATE OF MICHIGAN APC CODES

		CRT CONSOLE	708	5%
		DICTAPHONE	229	5%
		DGT9000 & DGT9000d	740	15%
		STAT-ALERT	688	5%
<b>2.5</b>	<b>ANTENNA SYSTEMS</b>	ALL ITEMS	207,291,229	5%
<b>2.7</b>	<b>RECEIVERS</b>	MINITOR II	646	10%
		SPECTRA TAC	273	16%
		QUANTAR RECEIVER	743,509	15%
		ASTRO TAC RECEIVER	743	15%
		MTR2000 RECEIVER	512	15%
<b>3.0</b>	<b>PORTABLE RADIOS</b>	ASTRO XTS3000	620,408,505,476	15%
		ASTRO SABER	310,465,256	15%
		HT1000	402,476	25%
		JT1000	402,476	25%
		MT2000	355	20%
		MTX8000 & MTX9000	511	15%
		MTS2000	432,466,476,129	15%
		LTS2000	678,795	15%
		VISAR	720,414	18%
		MT1000	546	16%
		SABER	654,655,471,656	
			657,571,256	25%
		SABER ACCS	500,256	15%
		RF LINKS	351	10%
		GTX	866	15%
		ASTRO VEH ADAPTER	465	15%
<b>4.0</b>	<b>PAGERS</b>	EMBARC	608	5%
		KEYNOTE	348,746	
		Qty. 1-5		5%
		Qty. 6-12		8%
		Qty. 13-19		15%
		Qty. 20+		18%
		MEMO EXPRESS	723	5%
		ADVISOR	383	5%
		ADVISOR GOLD	584,578	5%
		ADVISOR PRO	141	5%
		BRAVO CLASSIC	724	5%
		RENEGADE	249	5%
		ULTRA EXPRESS	120	5%
		BRAVO FLEX	77	5%
		DIRECTOR II	646	10%
		LIFESTYLE PLUS	724	5%
		PF300	348	5%
		ALPHALERT	233	5%

# STATE OF MICHIGAN APC CODES

		MINITOR III	253	15%
4.1	PAGING ENCODERS	WORDTREK	444	5%
		SITECALL	145,226	5%
		PEOPLE FINDER	265,226	5%
		ALPHAMATE 250	516,226	5%
		SITEMATE	146,226	5%
		COURTESY CALL	146,226	5%
		FASTPAGE 300	81,226	5%
		ZETRON 640,2100,2200	81,226	10%
		METROPAGE	257	5%
		WORD SENDER	728	0%
		SEL CALL	706	5%
		DATANET	233	5%
5.0	SECURENET	KEY LOADER	424	16%
		COMPARATOR	424	16%
		VOICE MODEM	643	16%
		KEY MGMT. CONTROLLER	137	15%
		CONSOLE INTERFACE	424	16%
		KVL3000	201,462,414,454	16%
		ASTROTAC	525	16%
		ASTRO DIU	524	15%
6.1	PRIVACY PLUS	SYSTEM WATCH	647,747	15%
		RF AIR TIME ACCUM.	786	15%
		SHARENET	277	10%
		MBE	152	10%
6.2	TRUNKED RADIO	SMARTWORKS	277	15%
		SHARENET	277	15%
		STARTSITE	495	10%
		STARTSITE EXPRESS	495	10%
		RF-ATA	786	15%
		SMARTNET	277	15%
		SMARTNET II	131	15%
		SIMS II, SIP, SYS. WATCH	647	15%
		LAS	747	15%
		PROGRAM KEY	647	15%
		SMARTZONE	280,281	15%
7.0	FLASHPORT	SOFTWARE UPGRADES	430,823,729,195	0%
11.0	DATA SYSTEMS	PLANTRONICS/ITRONICS	170	0%
		FORTE	629	5%
		WORKSTATION 520	736	5%
		PRM660	855	5%
		VRM500, VRM600	503, 508, 554,855	5%



## MOSCAD ONE EACH PRICING LIST

<u>MOT Model</u>	<u>Product Description</u>	<u>New Unit</u>
6802991G90	Service Manual	\$114.25
CKN1027_SP	(64 pin to two 50 pin telco connectors) Special cable for S O M	\$39.24
CLN1309	19" rack panel for mounting up to 3 RS485 Jnct Boxes and/or RS232	\$69.71
CPN1037	-48 to +12 Vdc Converter & cable	\$370.01
DQ201M	DB25 line driver (Model 201M)	\$224.82
DQ209FT	DB9 line driver (Model 209FT)	\$224.82
DQ40622	19" rack mount shelf for UDS modem	\$219.59
DQ6209547000010	UDS "Surfer" 56 Kbps external (GMC) ISA modem (1 for Remote Acc	\$418.26
F2316	Programming Tool Box	\$1,045.65
F4300	MCP-T, TCP/IP Processor	\$10,152.61
F5999ASP976351	19" Rack Mount Configuration for SNMP-Gateway	\$290.18
F6900	MOSCAD wall mount RTU with 6-slot backplane, Series 300 CPU mo	\$2,217.76
F6936	MOSCAD CPU-400 Module	\$3,674.31
FKN4400	RS485 CPU Interconnect Cable (one per CPU required)	\$21.01
FLN2334	SNMP Processor (MCP-S)only	\$5,716.35
FLN6457_SP96554	Line driver adapter & cable	\$146.39
FLN6458	Modem cable (CPU to Modem)	\$125.48
FRN5655	Add Async RS232 interface	\$170.37
FRN5727	RS485 Junction Box, up to 7 CPU's	\$76.62
L3034	Windows NT Server for 5 Users	\$2,187.16
I3071	300Mhz Micron Computer	\$6,314.80
SPQ34BCA0096	GWS Database programming & Graphics	\$2,107.16
SPQ34BCA0161	InTouch Graphic Master Software Licensing for Database & Graphic s	\$191.57
SPQ34BCA0162	MOSCAD Front End Processor (FEP) Software Licensing for device i	\$957.80
SPQ34BCA0163	MOSCAD Remote Terminal Unit (RTU) Software Licensing for device	\$191.57
SPQ34BCA0164	Alcatel Digital Microwave Radio Polling Engine	\$5,960.23
T5739	InTouch by Wonderware Runtime Node (includes Runtime, NetDDE w	\$11,014.74
T5806	Win 911 Paging Package for Windows NT	\$2,788.41
T5807	InTouch NT by Wonderware - Development node (includes developm	\$23,527.21
T5897	RocketPort 32	\$2,200.00
V051	MOSCAD 19" Rack Mount configuration	\$0.00
V274	Delete Power supply, 5AH battery and 2nd 19" backplane	(\$370.01)
V345	Add Async RS232 interface (one per CPU required)	\$173.79
V369	Replace standard 8-slot MB with (4 CPU + 4 I/O) MB	\$224.24
V377	ModBus Driver (protocol between MOSCAD FEP & Master Central)	\$871.38
V380	Digital Input Module, 60 Digital inputs	\$426.06
V418	Replace standard 8-slot MB with (8 CPU, NO I/O) MB	\$348.55
V425	Add additional MOSCAD CPU 300	\$3,394.01
V426	Replace MOSCAD CPU 300 with CPU 400	\$280.30
V440	SNMP Option	\$1,342.52
V511bjsp	Software License for MOSCAD I/O (per module)	\$56.06
V511bmosp	Software License for Alcatel M/W alarms (per radio)	\$224.24
V511cjsp	Software License for MOSCAD I/O (per module)	\$65.95
V511cmosp	Software License for Alcatel M/W alarms (per radio)	\$168.19
V511djsp	Software License for MOSCAD I/O (per module)	\$56.06
V516	16 DO module, 16 Magnetic-latch relay output closures	\$577.42

# EDC Emergency Radio Service, INC.

INVOICE

Division  
 x 711096  
 Cincinnati, OH 45271-1096  
 (219) 894-4145 • (800) 377-2929

INVOICENUMBER 98-100885

CUSTOMER NO. MOT001  
 PAGE NO 1 OF 1

**B I L L T O** MOTOROLA, EAST LANSING  
 SUITE 111  
 2875 NORTHWIND DR.  
 EAST LANSING, MI 48823  
 517/332-3274

**S H I P T O** SAME

DATE	TIME	PURCHASE ORDER/CONTRACT NO.		SHIP VIA	FOB.	PAYMENT TERMS	
06/23/98		Bob Batis			Origin	Net 30 Days	
ORDER DATE	REFERENCE	SALES CODE	SCHEDULED	EMP	TECH	TIME	LOC
06/23/98	N00000	- -					
MAKE	MODEL			COMPLETE	RELEASED	STATUS EP	

QUANTITY	ITEM/FIX CODE	DESCRIPTION	EMP	UNIT PRICE	EXTENDED PRICE
REWORKED	H.O.S.	DETAILS			

JOB SITE: 6104/ADA

1	0 LABOR	MOBILIZATION OF SPECIALIZED EQUIPMENT TO FACILITATE MOTOROLA'S REQUEST TO EXPEDITE THE UNSCHEDULED DRILLING OF AND INSTALLATION OF REINFORCED CONCRETE CAISSON FOUNDATIONS FOR THE ABOVE REFERENCED 475' SELF SUPPORTING TOWER	731	30000.00	30000.00
---	---------	--	-----	----------	----------

\*\*\*THANK YOU\*\*\*  
 YOUR BUSINESS  
 IS GREATLY  
 APPRECIATED!!!

Taxable	0.00
Non Taxable	30,000.00
Tax	0.00
Total	30,000.00

# MPSCS HIGH LEVEL SUMMARY

Phase	Baseline Variances					Baseline			Subscribers			
	A	B	C	D	E	F	G	H	J	K	Orders	Balance
	Exhibit E Contract (1)	Exhibit K DDP's "Build To" (2)	Adj for Twr/Bldg Alterations (3)	SOM Scope Adjustments (5)	SOM Mod's (4)	SOM Additions (6)	Local Users Additions (7,10)	SS Req'd for MOI to do BL Item (8)	Adjusted Baseline (9)	Variance to Available Baseline (11)		
Phase 1	26,189,272	28,446,141	1,415,823	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
(L) Tower/Bldg adjustment												
(M) Land Cost			(873,813)									
Phase 1 Sub Total	26,189,272	28,446,141	542,010	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
Phase 2	34,730,639	0										
Phase 3	47,671,945	0										
Phase 4	59,074,186	0										
Infrastructure	167,666,042	28,446,141	542,010									
Change Order Summary						928,847						
Finance Charge	3,061,382	675,747										
Subs - Total Project	16,548,490											16,548,490
Finance Charge												149,776
Subscriber Fund Total		7,544,563									9,931,896	16,698,266
Orders to date												6,766,371
Proj Total	187,275,914	36,666,471	542,010	(1,033,488)	476,207	3,598,533	859,792	24,440,456	24,281,971	158,485	9,931,896	6,766,371

# VARIANCE SHEET

Descriptions		Base Line Variance			
Old	New	SOM Scope Deletions	SOM Modifications	SOM Additions	Local Users
		D	E	F	G
1	11Y-MWR				
2	40-MWR				
3	20-MWR(D)				
4	43Z				
5	16T				1104
6					1108
7	19				1202
8	14T				1402
9	42H				1804
10	49				1902
11	25T				2502
12					2904
13	30				3802
14					5802
15	11T-MWR(D)				1106
16	41X				1702
17	42				1802
18	23Z				2402
19	24X				2404
20	21T-MWR(D)				2504
21	29T				2902
22					3402
23	37				3702
24	13B				6802
25	14Z				1502
26	27Z				2102
27	26Z				2602
28	28Z				2802
29	39T				3902
30	41Z				5702
31	16I				1102
32	Fire Supression	(157,739)			
33	Report Integrator	(40,000)			
34	T1 Bulk Encryptors	(40,000)			
35	Customer Selected Options			1,680,708	
	Adjust LU to match Documentation				(44,413)
	Totals	(1,033,488)	476,207	2,669,686	859,792

## DATA SHEET

Exhibit E Breakdown					
	Total	Fin Charge	Subscribers	Fixed Equip	
Phase 1	39,618,212	3,061,382	10,367,558	26,189,272	
Phase 2	37,078,300		2,347,661	34,730,639	
Phase 3	50,431,798		2,759,853	47,671,945	
Phase 4	60,147,604		1,073,418	59,074,186	
	<b>187,275,914</b>	<b>3,061,382</b>	<b>16,548,490</b>	<b>167,666,042</b>	
Exhibit K Breakdown					
	Total	Fin Charge	Subscribers	Fixed Equip	
Phase 1	36,616,853	626,129	7,544,583	28,446,141	
Phase 2		-	-	-	
Phase 3	-	-	-	-	
Phase 4	-	-	-	-	
	<b>36,616,853</b>	<b>626,129</b>	<b>7,544,583</b>	<b>28,446,141</b>	
Finance Charge					
	Exhibit E	Pro-Rata	Contract	DDP	Over Baseline
Phase 1	3,061,382	647,635	689,909	626,129	(21,506)
Finance Adjusted per Contract				49,618	49,618
Phase 2	-	606,115	645,679		(606,115)
Phase 3		824,404	878,216		
Phase 4		983,228	1,047,407		
	<b>3,061,382</b>	<b>3,061,382</b>	<b>3,261,211</b>	<b>675,747</b>	<b>(578,004)</b>
Transfer to Sub Fund			149,776		
			3,111,435		
		Equipment	Charge	Factor	
		184,214,532	3,261,211	1.770%	
Subscriber Reconciliation					
Exhibit E	Equip	Spares	Install	Total	

## DATA SHEET

Phase 1	9,521,448	-	846,110	10,367,558	
Phase 2	2,202,211	-	145,450	2,347,661	
Phase 3	2,588,620	-	171,233	2,759,853	
Phase 4	1,004,195	-	69,223	1,073,418	
	15,316,474	-	1,232,016	16,548,490	
Exhibit K					
Phase 1	6,606,347	239,404	698,832	7,544,583	
Phase 2				-	
Phase 3				-	
Phase 4				-	
	6,606,347	239,404	698,832	7,544,583	

### Subscriber Orders

Desc	Origin	Equip	Install	Fin Chg	Total	Balance
						16,548,490
Phase 1 DDP List	P1DDP	7,346,152	742,001	0	8,088,153	8,460,337
Finance Charge Remaining Bal (8,460,337)					-	149,776
Sub Total					-	8,610,113
MSP Order	CCN # 11	65,125	4,875	1,239	71,239	8,538,873
Spares	CCN # 11	393,604	27,105	7,448	428,157	8,110,717
DOC	CCN # 11	257,864	60,625	5,638	324,127	7,786,589
MA	CCN # 11	45,005	6,890	919	52,814	7,733,775
MSP	CCN # 12	141,743	10,920	2,703	155,366	7,578,410
DOC	CCN # 12	464,447	28,080	8,719	501,246	7,077,164
DEQ	CCN # 12	48,602	6,435	974	56,011	7,021,153
DNR	CCN # 12	214,888	35,462	4,432	254,782	6,766,371
					-	6,766,371
					-	6,766,371
					-	6,766,371
		8,977,430	922,393	32,073	9,931,896	6,766,371

### Tower Adjustments

Phase 1	Tower	Building	Total
1202	-	(31,160)	(31,160)
1402	(163,898)	(31,160)	(195,058)
1804	-	(30,780)	(30,780)

## DATA SHEET

1902	(66,267)	(30,780)	(97,048)
2502	-	(31,683)	(31,683)
3802	-	(31,684)	(31,684)
5802	(247,850)	(24,953)	(272,803)
1106	-	(26,471)	(26,471)
1702	(217,992)	(19,368)	(237,360)
1802	-	(30,780)	(30,780)
2402	-	(21,635)	(21,635)
2404	(143,879)	(21,635)	(165,514)
2504	-	(25,395)	(25,395)
3402	-	(16,845)	(16,845)
3702	-	(8,619)	(8,619)
6802	-	(30,803)	(30,803)
1502	(37,064)	(21,202)	(58,266)
2102	-	(18,513)	(18,513)
2602	-	(22,200)	(22,200)
2802	-	(21,628)	(21,628)
3902	-	(20,621)	(20,621)
5702	-	(20,954)	(20,954)
<b>Total P1</b>	<b>(876,951)</b>	<b>(538,872)</b>	<b>(1,415,823)</b>
<b>Phase 2</b>			
<b>Total P2</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Phase 3</b>			
<b>Total P3</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Phase 4</b>			
<b>Total P4</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Grand Total</b>	<b>(876,951)</b>	<b>(538,872)</b>	<b>(1,415,823)</b>

### Change Order Summary

Description	Chg No	Amount
	1	0
	2	0
	3	0
	4	0

## DATA SHEET

Fuel Tanks and Telco	5		172,280
Greyhound facility changes	6		20,400
Add'l Ambassador Bds	6		13,810
X terminals at Disp	7		105,717
Encrypted DIU's	7		6,237
Console Logging Upgrade	7		29,494
2102 Sunk Costs	7		102,077
	8		-
	9		-
2102 Site Survey	10	2nd Site Investigation Survey for 2102 - Gravel Pit	16,464
2102 - Cost of Svcs performed	10		56,000
GPS Clock Source	10	Originally a Customer Responsibility	32,740
1202 - Raven Order Wire	10		2,958
Construction of Site 2102	12		156,070
Phase 1 HVAC Controller Retrofit	13		104,400
Phase 2 HVAC Controller Retrofit	13		110,200
			-
Change Order Summary			928,847
<b>Land Cost Summary</b>			
Phase One Land Purchase			873,813
Total			873,813

## NOTES

### Notes:

- 1 Baseline pricing from Exhibit E - Less Subscribers and Finance Charges
- 2 Total Contract Commitments from Exhibit K - Less Subscribers and Finance Charges
- 3 Described in section 1.35.9 in Contract
- 4 Baseline Functional Modification (Net)
- 5 Sum of all State of Michigan Baseline Requirement Adjustments
- 6 Additional State of Michigan Requirements
- 7 Additional Local User Requirements
- 8 Dollars required for Motorola to meet adjusted baseline requirements adjusted for adds;  
[B-(E+F+G)]
- 9 Total dollars for Motorola to meet adjusted baseline requirements; (Exhibit E minus; Adjustments for towers and buildings; plus Deletions; plus Net of Tower/Bldg Adjustments and land cost) [A-L+D+(L+M)]
- 10 No adjustments made for increased tower loading required as a result of local users
- 11 Variance between "Adjusted Baseline" dollars (J) and "Motorola's required dollars" from Exhibit K (H) [H-J]
- 12 The baseline price of \$187,275,915 represents the State's purchase price for the baseline functionality of the system as specified in Exhibit A of the contract.  
Reductions in Baseline functionality result in corresponding reductions in the Baseline price.  
Additional items or modifications and optional features ordered by the State shall be in addition to the Baseline Price.

**CONTRACT CHANGE NOTICE NO. 12  
TO THE  
STATE OF MICHIGAN  
800 MHZ RADIO SYSTEM & TELECOMMUNICATIONS BACKBONE NETWORK  
CONTRACT NO. 071B5000240  
BETWEEN  
THE STATE OF MICHIGAN  
AND MOTOROLA, INC.  
DATED DECEMBER 8, 1994**

Pursuant to the terms of Section 1.41. **General**, subparagraph B, the following modifications are hereby made:

- 1.) In the Contract Terms and Conditions, Section 1.23. Payment Terms, delete Sections 1.23.2., 1.23.3., and 1.23.4. and replace them with the new Sections listed below:

**1.23.2. Phases 2, 3, and 4 - Facilities**

<b>Item</b>	<b>Description</b>	<b>Payment Milestone</b>
1	Site Development per site	20 % of Total Site Costs upon achievement of Site Development Milestone
2	Tower and Prefabricated Building Installation per site	40 % of Total Site Costs upon achievement of Tower and Prefabricated Building Installation Milestone
3	Final Site Development per site	20 % of Total Site Costs upon achievement of Final Site Development Milestone
4	Site Development, Tower and Prefabricated Building, Final Site Development per phase	10 % of Total Site Costs upon achievement of Phase Acceptance Milestone
5	System Site Development, Tower and Prefabricated Building, Final Site Development	10 % of Total Site Costs upon achievement of Statewide System Acceptance Milestone

**1.23.3. Phases 2, 3, and 4 - Renovations and Additions**

<b>Item</b>	<b>Description</b>	<b>Payment Milestone</b>
1	Renovations and Additions	Payment milestones shall be as defined in the Phase DDP

**1.23.4. Phases 2, 3, and 4 - 800 MHz System**

<b>Item</b>	<b>Description</b>	<b>Payment Milestone</b>
1	Central and Fixed equipment	60 % of Total 800 MHz Equipment and Installation Costs upon achievement of the 800 MHz Equipment Installation Milestone
2	Central and Fixed equipment	20 % of Total 800 MHz Equipment and Installation Costs upon achievement of the 800 MHz Equipment Integration Milestone
3	Central and Fixed equipment	10 % of Total 800 MHz Equipment and Installation Costs upon achievement of Phase Acceptance Milestone
4	Central and Fixed equipment	10 % of Total 800 MHz Equipment and Installation Costs upon achievement of Statewide System Acceptance Milestone
5	All Training Costs	100% of costs for Phase 2, 3, or 4 upon conducting and acceptance of the training
6	APCO 25 Trunking Suite	90% of all charges upon successful completion of the Factory Tests for Phase 2, 800 MHz Central equipment
7	APCO 25 Trunking Suite	10% of all charges upon achievement of Statewide System Acceptance Milestone
8	Carrying Charges	100% of Phase Cost upon achievement of Associated Phase Acceptance Milestone as outlined in Section 1.23.G

**1.23.5. Phases 2, 3, and 4 - TBN System**

<b>Item</b>	<b>Description</b>	<b>Payment Milestone</b>
1	TBN Equipment	60 % of Total TBN Equipment and Installation Costs upon achievement of TBN Installation Milestone
2	TBN Equipment	20 % of Total TBN Equipment and Installation Costs upon achievement of TBN Integration Milestone
3	TBN Equipment	10 % of Total TBN Equipment and Installation Costs upon achievement of Phase Acceptance Milestone
4	TBN Equipment	10 % of Total TBN Equipment and Installation Costs upon achievement of Statewide System Acceptance Milestone
5	All Training Costs	100% of costs for Phase 2, 3, or 4 upon conducting and acceptance of the training

**1.23.6. Phase 2, 3, and 4 Subscriber Equipment**

<b>Item</b>	<b>Description</b>	<b>Payment Milestone</b>
1	Subscriber Equipment (Mobiles, portables, control stations and vehicular repeaters)	90% of total costs upon achievement of Subscriber Installation Milestone
2	Subscriber Equipment	10 % of total costs upon achievement of Statewide System Acceptance Milestone

- 2.) In EXHIBIT C - TESTING AND ACCEPTANCE, Section 1.1.4. Project Punchlist, delete the second paragraph beginning with the words "Resolution of Punchlist ...", and replace it with the following:

Resolution of Punchlist items shall be addressed by priority as indicated by a Exception Procedure Code. The Punchlist will contain: 1) An item identifier, 2) The date of the Punchlist, 3) Site where there was an Exception or Fail, 4) A test plan reference, 5) The associated Test Checklist, 6) A description of the Exception/Fail, 7) The Exception Procedure Code that categorizes the State exception to properly prioritize the efforts to resolve the item, 8) The equipment, feature or facility involved, 9) A completion date and 10) Resolution comments. As a cover sheet the Punchlist will have signature blocks for the Motorola and State Project Directors for execution related to final close-out of the Punchlist

- 3.) In EXHIBIT C - TESTING AND ACCEPTANCE, Section 1.2.5. Resolution Procedure, delete the third paragraph beginning with the words "After a Punchlist ...", and replace it with the following:

After a Punchlist item has been resolved, the associated test shall be retaken and witnessed by the State. When the State has determined that all of the Punchlist Items have been resolved, the cover sheet of the Punchlist shall be filled out and signed by both Parties

- 4.) In the Terms and Conditions, Section 1.20.A., Documents, add Exhibit L - Additional Costs.
- 5.) In Exhibit L - Additional Costs, the following becomes Section 1.

### **1. SITE 2102 LAKEVILLE**

The following conditions are necessary for the completion of work at site 2102:

- Clear Title w/ Boundary Survey at Time of "Notice to Proceed"
- FAA / FCC approvals
- Resource Availability (Phase 2 and/or other efforts will impact resources)
- Re-Use of existing tower (as manufactured and placed in storage).
- Closing of property concurrent with tower construction
- Utility power installation

The additional and incremental costs to provide services required to construct, install, optimize and test, site / system equipment performance relative to site 2102 is \$156,070 00 based on the following:

- A) Perform soil investigation and provide engineering analysis report.
- B) Perform Microwave Path Engineering and Frequency Coordination for the path 2102 to 2404
- C) Develop new tower foundation design, review and approve
- D) File applicable FAA Permit application(s)
- E) File applicable FCC License application(s)
- F) Provide required "60 day Notice" to PiROD INC requesting preparation of stored 2102 tower steel for shipment.
- G) Provide required "30 day Notice" to Miller Telecom Services, requesting preparation of stored 2102 equipment shelter for shipment
- H) Prepare Microwave and 800 MHz site equipment for installation
- I) Complete site construction activities to the level of abandoned Lakeville site.  
i.e : Clearing, grubbing, access road construction and electrical service pedestal installation.
- J) Underground commercial power access conduits.

- K) Incremental effort / cost to perform required Site Construction Field ATP.
- L) Design, procurement and placement of re-bar cages for tower foundation installation
- M) Microwave Site Equipment Implementation (Delivery - Re-mobilize)
  - Installation at 2102
  - Equipment Optimization at Sites 2102 and 2404
  - Path Alignment (2102 to 2404)
  - Line Sweeps - Perform at 2102 and 2404
- N) 800 MHz Site Equipment Implementation (Delivery - Re-mobilize).
  - Installation at 2102
  - Equipment Optimization at 2102
  - Line Sweeps at 2102
- O) Incremental effort / cost to perform required 800 MHz Specification Test per Phase 1 Field ATP of that test category, for site 2102 Only.
- P) Incremental effort / cost to perform required TBN Specification Test per Phase 1 Field ATP of that test category, for the following path and site equipment, 2102 to 2404
- Q) Incremental effort / cost to perform required BER Test (TBN) per Phase 1 Field ATP of that test category, for the following path, 2102 to 2404
- R) Incremental effort / cost to perform required Coverage Test per Phase 1 Field ATP of that test category relative to Site 2102 only.
- S) Incremental effort / cost to perform required Field Functional Test per Phase 1 Field ATP of that test category relative to Site 2102 only

Payment is due upon completion and acceptance by the State.

- 6.) In Exhibit E - EQUIPMENT AND PRICE LIST, Section VII - Maintenance Pricing, add a new Sub-paragraph C, entitled "Current Time & Material (T&M) / Flat Rate Pricing", as follows:

**C. Current Time & Material / Flat Rate Pricing 1/24/98**

1.0. SYSTEM SUPPORT CENTER

1.1 Technical Support Consulting Services

7:00 am to 7:00 pm  
Monday through Friday,  
Excluding holidays  
\$200.00/hour  
One hour minimum

After hours:  
Monday through Friday  
Including holidays  
\$300.00/hour  
One hour minimum

1.2 Remote Monitoring / Remote Diagnostics

\$1,200 per dial in.  
Does not include Consulting and Technical Support

1.3 To obtain service:

Motorola System Support Center  
1311 East Algonquin Road  
Schaumburg, Illinois 60196  
1-800-233-9949

2.0 RADIO SUPPORT CENTER

2.1 Flat Rate Repair Services

Astro Spectra	\$425.00
Astro Digital Saber	\$490.00

2.2 Average Repair Time

Same day as receipt of equipment. Excludes weekends and holidays recognized by Motorola. This is the current average repair time, and is not meant as a guarantee of future performance

2.3 Time and Material Rate

\$115.00 per hour plus parts cost. Time and material repair is only available for models not covered by Radio Support Center Flat Rate.

## 2.4 To obtain service:

Motorola Radio Support Center  
 3761 South Central Avenue  
 Rockford, Illinois 61102  
 1-800-227-6772

## 3.0 FLAT RATE TERMS AND CONDITIONS

All repairs performed at the Radio Support Center are covered by a conditional 90-day Repair Warranty

Prices include all parts and labor for routine electrical failure. No Trouble Found units will be billed at the published flat rate price. General estimates will be performed at \$40.00 per unit; detailed estimates will be performed at the current Time and Material rates. Estimate fees will be waived if approval to repair is received. All Mobile, Portable and Data equipment must be received as complete radios. Price does not include state and local taxes. Price includes UPS overnight round-trip shipping (DOMESTIC U.S. ONLY). If the State declares more than \$100 in value, the State is liable for the UPS insurance charges. The State must use either UPS Consignee Billing or standard UPS overnight shipping for inbound shipping to be covered by Motorola. All of the above rates are the current rates as of January 24, 1998 and subject to change at any time. Motorola shall invoice the State at the current rate in effect at the time of the State's request for service.

## 3.1 Flat Rate Exclusions

- 3.1.1 Units which exhibit evidence of physical, liquid, chemical damage or electrical abuse failures
- 3.1.2 Special products, modified units, consolettes, and non-standard software.
- 3.1.3 Batteries, CRT assemblies, external microphones, key lamps, key caps, antennas, chargers, and all other accessory items
- 3.1.4 Motorola reserves the right to utilize new or reconditioned assemblies

## 7.) In Exhibit B - STATEMENT OF WORK, Section 1.8.1.4. Submittals, delete the following from the third paragraph:

"the District Headquarters associated with that Site,"

## 8.) In Exhibit B - STATEMENT OF WORK, Section 1.8.2.2.3. As Built Drawings, delete the third paragraph and replace it with the following:

One copy of the electronic files (AUTOCAD release 14 or as mutually agreed to by the State and Motorola) of the as-built drawings shall be delivered to the State

- 9.) In Exhibit B - STATEMENT OF WORK, Section 1.7.1.1.2. Component Classifications, delete the table added in Contract Change Notice No. 7, entitled "Critical Component Failure Matrix" and replace with the following matrix:

**Critical Component Failure Matrix**

<b>Severity 1 Problem Type</b>	<b>Clarifications if applicable</b>
Site Down (No Inbound or Outbound Audio)	
System in Site Trunking, or Audio Switch Down	
CEB Down (Operator positions at site not operating)	<ul style="list-style-type: none"> <li>Any one operator position failure with no alternate operator position available.</li> </ul>
Tellabs DACS Fault	
Master Site UPS Fail	
Microwave Link down	
East Lansing NCC Down	
Site or system components failure that result in the 800 MHz radio system to display excessive busies.	<ul style="list-style-type: none"> <li>Loss of 1/3 of the trunking voice repeaters.</li> </ul>
Critical Michigan State Police mobiles as determined by the State NCC Administrator on Memorial Day, Independence Day, Labor Day and their associated weekends.	
Site AC Power Failure & Generator no Start or AC Transfer Fail.	Limited Time Before site power loss: <ul style="list-style-type: none"> <li>UPS On-line for a period exceeding 5 minutes</li> <li>Lose ALL site lights with other power fail alarm(s) at that site, for a period exceeding 5 minutes</li> <li>Charger A/B both fail for a period exceeding 5 minutes.</li> </ul>
Microwave Chargers Fail	
Fire Alarm Smoke Alarm	<ul style="list-style-type: none"> <li>Needs resetting to restore ventilation system</li> <li>Needs resetting to restore ventilation system.</li> </ul>

- 10) In Exhibit D - SCHEDULE, Section 1.2. Project Milestones, delete Sections 1.2.1. through 1.2.4. and replace with the following:

### 1.2.1. 800 MHz System

<u>Milestone #</u>	<u>Description</u>	<u>% of Total 800 MHz Equip. Costs</u>
<b>Milestone # 1 ( Installation Milestone)</b>	800 MHz ( central and fixed; includes system controllers, system managers (TMS & PMS), audio switches, packet switches, repeaters, site control, and consoles) equipment delivered, inventoried, and powered	60 % of Total 800 MHz Equipment and Installation Costs
<b>Milestone # 2 ( Integration Milestone)</b>	Successful completion of Field Specification Tests as described in Exhibit C 800 MHz Testing and Acceptance	20 % of Total 800 MHz Equipment and Installation costs
<b>Milestone # 3 ( Phase Acceptance Milestone)</b>	Successful completion of Field Functional/Operational tests for 800 MHz equipment as described in Exhibit C Testing and Acceptance, and resolution of installation Site delays as mutually agreed to by both Parties	10 % of Total 800 MHz Equipment and Installation Costs
<b>Milestone # 4 ( Statewide System Acceptance Milestone)</b>	Successful completion of Final Statewide Acceptance Tests as described in Exhibit C for central and fixed equipment and delivery of all as-built documentation	10 % of Total 800 MHz Equipment and Installation Costs

### 1.2.2. Subscriber Equipment

<u>Milestone #</u>	<u>Description</u>	<u>% of Total 800 MHz Equip. Costs</u>
<b>Milestone # 1 ( Installation Milestone)</b>	Equipment is inventoried by the State and installed at the State's designated sites, in designated vehicles, or delivered to the State's designated location	90 % of Subscriber Equipment and Installation Costs
<b>Milestone # 2 ( Statewide System Acceptance Milestone)</b>	Successful completion of Final Statewide Acceptance Tests as described in Exhibit C for central and fixed equipment and delivery of all as-built documentation	10 % of Subscriber Equipment and Installation Costs

### 1.2.3. TBN Equipment

<b>Milestone #</b>	<b>Description</b>	<b>% of Total TBN Equip. Costs</b>
<b>Milestone # 1 ( Installation Milestone)</b>	TBN ( microwave, multiplex, alarm and control (ACS & DACS)) equipment delivered, inventoried, and powered	60 % of Total TBN Equipment and Installation Costs
<b>Milestone # 2 ( Integration Milestone)</b>	Successful completion of Field Specification Tests as described in Exhibit C Testing and Acceptance for TBN equipment	20 % of Total TBN Equipment and Installation costs
<b>Milestone # 3 ( Phase Acceptance Milestone)</b>	Successful completion of Field Functional/Operational tests for TBN equipment and Field Functional, Operational and Specifications Tests for Network Management equipment as described in Exhibit C Testing and Acceptance for TBN equipment, and resolution of installation Site delays as mutually agreed to by both Parties	10 % of Total TBN Equipment and Installation Costs
<b>Milestone # 4 ( Statewide System Acceptance Milestone)</b>	Successful completion of Final Statewide Acceptance Tests as described in Exhibit C for central and fixed equipment and delivery of all as -built documentation	10 % of Total TBN Equipment and Installation Costs

### 1.2.4. Facilities

<b>Milestone #</b>	<b>Description</b>	<b>% of Total Site Costs</b>
<b>Milestone # 1 ( Site Development Milestone )</b>	Completion of clearing, rough grading, and installation of access road, tower and shelter foundations	20 % of Total Site Costs
<b>Milestone # 2 ( Tower and Prefabrication Building Installation Milestone )</b>	Tower erection complete and inspected Prefabricated building off loaded and on to foundations. Microwave and 800 MHz antenna systems installed	40 % of Total Site Costs
<b>Milestone # 3 (Final Site Development Milestone )</b>	Completion of site restoral, final aggregate surfacing, and all fencing and site grounding Prefabricated building systems, grounding and lighting protection system, and emergency power systems installed and inspected	20 % of Total Site Costs
<b>Milestone # 4 ( Phase Acceptance Milestone )</b>	Successful completion of Field Functional/Operational Tests and Phase Acceptance tests as described in Exhibit C for central and fixed equipment, and resolution of installation Site delays as mutually agreed to by both Parties	10 % of Total Site Costs
<b>Milestone # 5 ( Statewide System Acceptance Milestone )</b>	Successful completion of Final Statewide Acceptance Tests as described in Exhibit C for central and fixed equipment and delivery of all as-built documentation	10 % of Total Site Costs

- 11.) In Exhibit A - System Description and Technical Specifications, replace Sections 6.6.3. and 6.10.1. with the following:

#### 6.6.3. Digital Multiplexers

All digital M1-3 multiplex equipment shall employ redundant low speed and high speed cards. Two types of M1-3 multiplexers will be employed; Alcatel DMX-3003N and Alcatel RD-3100e

The Alcatel DMX-3003N low speed modules shall be protected on a 1:7 basis, while the high speed cards shall be protected on a 1:1 basis.

The RDI-3100e combines low and high speed functions on a single card and is protected on a 1:1 basis. Automatic switching shall occur when a module fails or if the receive signal falls below the BER threshold level. A second method of switching shall be a user-controlled, manual switch.

### 6.10.1. Digital Multiplex

Motorola shall provide M1-3 digital multiplex; Alcatel DMX-3003N (28 DS-1) and the Alcatel RDI-3100e drop and insert multiplex

Both multiplexers have self-monitoring capabilities executed by its Control Card. The Control Card constantly monitors on-line and off-line functions. The Control Card displays failures information via an LED. Alarm and diagnostic information can also be accessed via the User System Interface (USI). The RDI3100e will be configured for Extended Link Monitor Control (ELMC). ELMC provides for diagnostic access from any ELMC equipped and connected multiplex or radio in the TBN system.

Alarm reporting shall use a serial interface. This serial interface is MCS-11.

The following line interfaces shall be provided: 1) DS-1 Line Code: AMI or B8ZS strappable and 2) DS-3 Line Code: B3ZS.

Alcatel DMX-3003N digital multiplexers will be employed primarily at locations that interface DS-3 radios to DACS and at sites with three-way DS-3 junctions. DS-3 repeater sites requiring less than 8 DS-1 drops, shall primarily employ the Alcatel RDI-3100e drop and insert multiplexer.

- 12.) In Exhibit A, Section 9.5.2 Mechanical System Details, delete sub-item 2 in its entirety.
- 13.) In Exhibit A, Section 9.3.10 Transmission Line Entries, delete the verbiage of this section and replace it with the following:

One eighteen-port transmission line entry shall be provided for through-the-wall installation of the transmission lines. Entries shall be as manufactured by Microflect, Inc. (Catalog No. B1333 or approved equal). Sleeves shall be capped with water-tight removable caps.

- 14.) In Exhibit A, Section 9.3.7. Doors, delete item 4 in its entirety.
- 15.) In Exhibit A, Section 9.7.5.2. Function, sub-item 6, after the words "seven day", insert the words "deluxe programmable".
- 16.) In Exhibit A, Section 9.3.6 Fabrication, delete the third paragraph and replace it with the following:

The prefabricated building floors of the equipment room compartment, shall be covered with 12" x 12" x 1/8" commercial floor tile as manufactured by Armstrong. Floor covering shall include a commercial grade 4" vinyl base trim. Floor covering and base trim shall be installed in strict accordance with the manufacturer's directions. The generator room floor shall utilize the bare concrete floor, sealed with a water base, deep penetrating product such as LIQUI-HARD as manufactured by W.R. Meadows, Inc. or approved equal. The sealed concrete floor shall include a commercial grade 4" vinyl base trim.

- 17.) In Exhibit A, Section 9.6.2. Electrical System Details, delete sub-item 13. and replace it with the following:

13 Transtector APEX Series Model APEX3120TM, APEX4120IM, APEX3-120W/M, or APEX3-240W/M, the Transtector Model selected for an individual site will be based on the required service size and available utility voltage for that site.

- 18.) In Exhibit A, Section 11.4.3.1. AC Service, delete the first paragraph and replace it with the following:

The AC service entrance shall be protected by a Transtector APEX Series Model APEX3120TM, APEX4120IM, APEX3-120W/M, or APEX3-240W/M, the Transtector Model selected for an individual site will be based on the required service size and available utility voltage for that site.

- 19.) In Exhibit A, Section 9.4.5. Alarm Monitoring and Reporting, delete sub-item 13 and replace it with the following:

13. Humidity alarm (SPDT sensor, adjustable 40% to 90%)

- 20.) In Exhibit A, Section 9.5.1. General, under the minimum specifications, delete sub-items 2 and replace its with the following:

2. Humidity between 40 percent and 90 percent relative humidity in all seasons.

- 21.) In Exhibit A, Section 9.7.5.4 Auxiliary Contacts, in sub-item 6, delete the words "(Part of the tank by the State)".

- 22.) In Exhibit A, Section 9.7.4.1., Underground Fuel Tank Option, delete the first paragraph, and replace it with the following:

If the State elects to purchase this option, as priced in Exhibit E, Motorola, at the locations designated by the State, Motorola shall furnish and install an optional underground diesel fuel tank, complete with an initial fuel fill. The tank shall be a minimum 2500 gallon capacity underground, UL labeled, double wall, fiberglass diesel fuel tank as manufactured by Owens-Corning Fiberglass Corporation, Xerxes Fiberglass, Inc. (or equal approved by the State)

- 23.) In Exhibit A, Section 11.5 Tower, after the sentence beginning with the words "All connections ...", insert the following as an additional sentence:

A Burndy compression Type YGHP-C connector shall be considered an approved equal to the cadweld exothermic connection where the #1/0 Static-Cat conductor attaches to the #1/0 tower down conductor.

- 24.) In Exhibit A, Section 11.6 Antenna Systems, add the following as an additional sentence at the end of the first paragraph:

Burndy compression Type YGHP-C connectors shall be considered an approved equal to the cadweld exothermic connection where the Andrew transmission line ground kits are attached to the #1/0 tower down conductor.

And, replace the last paragraph with the following:

Arrestor Plus - lightning Surge Protectors, as manufactured by Andrew Corp shall be installed on each coaxial transmission line for the protection and isolation from lightning and electromagnetic pulse. The Andrew Arrestor Plus protector shall be installed at the equipment end of the coaxial transmission line and connected to the appropriate jumper from either the combiner or the multi-coupler, and bonded directly to the internal ground halo.

In conjunction the Andrew Arrestor Plus protectors an Andrew Universal Ground Bracket Assembly, model UGBA-DIN-36 be utilized at the cable entry port inside the prefabricated equipment shelter.

- 25.) In Exhibit A, Section 8.6 Fencing, delete the third paragraph and replace it with the following:

A 10 foot wide double drive through gate shall be installed on the main perimeter fence allowing direct entrance from the Site driveway. One five (5) foot panel of the gate shall be split horizontally in the middle. The top section of the split gate panel shall be capable of opening without opening the bottom. If the bottom is opened, the top shall also swing. Gate shall include a mushroom type flush plate with anchors, set in concrete, to engage center drop rod or plunger bar and locking devices. Padlock eyes shall be integrated as a part of the latching mechanisms, permitting the top section and bottom section gate leaves to be locked independently. Two (2) Master Lock 2441 padlocks shall be provided for the top and bottom latching mechanisms.

- 26.) In Exhibit A, Section 11.3 Site, add the following to the end of the first paragraph:

Penn Union grounding clamp assemblies or an approved equal may be installed in lieu of exothermic type connections where grounding jumpers are connected to tubular fence gate materials. A Penn Union Model UG-15 or approved equal shall be used for the gate post clamp, and a Penn Union Model GPL-27 or approved equal shall be used for the gate frame clamp.

- 27.) In Exhibit A, Section 9.7.4 Gas Piping, Tank and Foundation, as modified by Contract Change Notice #5, item 2.), delete the first paragraph and replace with the following:

Motorola shall furnish and install generator gas piping (including controls, gauges, switches, and regulators) from the generator to the propane tank. Motorola will also furnish and install the LPG fuel tank, pressure regulator and initial fuel fill, if required by the State, per the Detailed Design Plan for that Phase. Pricing will be provided on a by Phase basis, and categorized as an SOM Addition.

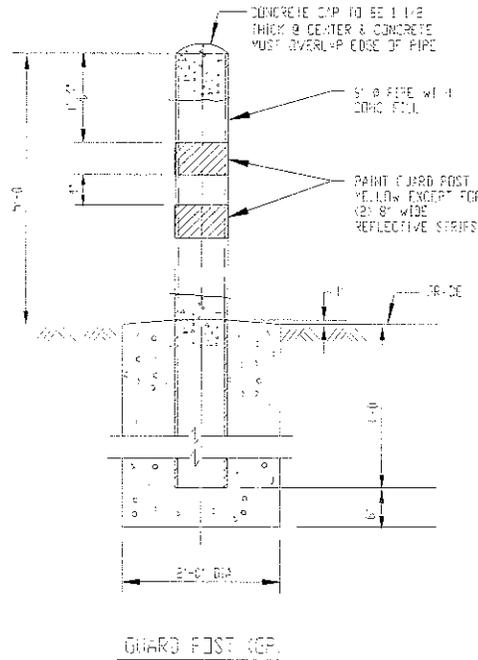
28.) In Exhibit A, add the following as a new section 8.7.1.:

**Section 8.7.1. Guard Post**

Motorola shall furnish and install a Guard post (Bollard) at those sites selected by the State, per the Detailed Design Plan for that Phase. Pricing will be provided on a by Phase basis, and categorized as an SOM Addition

Guard Post (Bollard)

- One (1) 6" pipe with concrete fill.
- 6" pipe to be set in concrete and extend 5'-0" AFG, as shown and noted in detail below.
- Guard Post to be painted safety yellow, as shown and noted in detail below.
- Guard Post to include two (2) each 8" reflective safety strips, as shown and noted in detail below.



29.) In Exhibit A, Section 8.8.1., added as a part of Contract Change Notice #5, delete the first paragraph and replace it with the following:

Motorola shall furnish and install Telephone Service capabilities at those sites selected by the State, per the Detailed Design Plan for that Phase Pricing will be provided on a by Phase basis, and categorized as an SOM Addition

- 30) In Exhibit A, Section 6.9.9 Pressurization System, delete the verbiage in this section and replace with the following:

**6.9.9. Pressurization System**

Motorola shall furnish and install an Andrew Corporation fully automatic membrane dehydrator and pressurization system at the necessary Sites. The dehydrator and pressurization equipment shall be sized in accordance with the manufacturer's recommendations.

The pressurization system shall include a distribution manifold with a pressure gauge and shutoff valve for each transmission line plus one (1) extra port equipped with pressure gauge and shutoff valve. An additional bleeder valve shall be provided on the distribution manifold which is separate from the extra transmission line port. The pressurization system shall be a 19" rack mount type, including, polyethylene tubing, connectors, straps, and other mounting hardware as required.

The dehydrator unit shall be equipped with a pressurization monitor to detect and provide alarm contact for the following conditions: 1) low pressure below 1.5 pounds per square foot

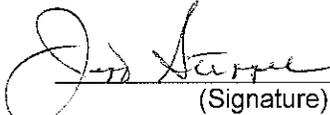
Dehydrator and monitor shall be 19" rack mounted and mounted two and one-half feet (2 1/2 ft) above the floor. The dehydrator shall be connected to a 120 volt, 60 Hz. power source with a standard 3 wire grounded plug

All lines shall be purged with dry air prior to final pressurization. Transmission line leak rate shall not exceed the manufacturers published recommendations.

- 31.) The above changes have caused an impact on the contract price. A REVISED High Level Summary of Exhibit K, dated March 18, 1998 is attached with Contract Changes to date.

- 32.) All other terms and conditions shall remain unchanged.

**THE STATE OF MICHIGAN**

By:   
(Signature)

Name: JEFF STEFFEL

Title: PROJECT DIRECTOR

Date: 4/6/98

**MOTOROLA, INC.**

d/b/a Motorola Communications & Electronics, Inc.

By:   
(Signature)

Name: CHUCK COUSINS

Title: V.P. + PROJECT DIRECTOR

Date: 3/18/98

# MPSCS HIGH LEVEL SUMMARY

Phase	Baseline Variances					Baseline			Subscribers			
	A	B	C	D	E	F	G	H	J	K	Orders	Balance
	Exhibit E Contract (1)	Exhibit K DDP's "Build To" (2)	Adj for Twr/Bldg Alterations (3)	SOM Scope Adjustments (5)	SOM Mod's (4)	SOM Additions (6)	Local Users Additions (7,10)	\$\$\$ Req'd for MGT to do BL req (8)	Adjusted Baseline (9)	Variance to Available Baseline (11)		
Phase 1	26,189,272	28,446,141	1,415,823	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
(L) Tower/Bldg adjustment												
(M) Land Cost			(873,813)									
Phase 1 Sub Total	26,189,272	28,446,141	542,010	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
Phase 2	34,730,639	0										
Phase 3	47,671,945	0										
Phase 4	59,074,186	0										
Infrastructure	167,666,042	28,446,141	542,010									
Change Order Summary	3,061,382	675,747				714,247						
Finance Charge												
Subs - Total Project	16,548,490											16,548,490
Finance Charge												149,776
Subscriber Fund Total		7,544,583									9,931,896	16,698,266
Orders to date												6,766,371
Proj Total	187,275,914	36,666,471	542,010	(1,033,488)	476,207	3,383,933	859,792	24,440,456	24,281,971	158,485	9,931,896	6,766,371

# VARIANCE SHEET

Descriptions			Base Line Variance			
	Old	New	SOM Scope Deletions	SOM Modifications	SOM Additions	Local Users
			D	E	F	G
1	11Y-MWR	1000				
2	40-MWR	1000				
3	20-MWR(D)	1000	(779,772)			
4	43Z	1001				
5	16T	1104		(32,817)		102,599
6		1108		209,137		
7	19	1202				17,717
8	14T	1402				
9	42H	1804				25,619
10	49	1902			9,827	8,912
11	25T	2502				24,900
12		2904		707,544		
13	30	3802				83,685
14		5802			13,691	
15	11T-MWR(D)	1106	(0)	(15,975)	157,976	
16	41X	1702				113,868
17	42	1802				25,727
18	23Z	2402			140,072	106,161
19	24X	2404			65,428	96,481
20	21T-MWR(D)	2504	(15,976)	(506,862)	18,368	32,152
21	29T	2902		41,530	11,645	
22		3402			153,973	
23	37	3702			50,519	
24	13B	6802			13,275	
25	14Z	1502				
26	27Z	2102			97,438	120,347
27	26Z	2602				28,403
28	28Z	2802				
29	39T	3902			119,968	
30	41Z	5702			29,054	
31	16I	1102		73,650	107,744	117,635
32	Fire Supression		(157,739)			
33	Report Integrator		(40,000)			
34	T1 Bulk Encryptors		(40,000)			
35	Customer Selected Options				1,680,708	
	Adjust LU to match Documentation					(44,413)
	Totals		(1,033,488)	476,207	2,669,686	859,792

# DATA SHEET

<b>Exhibit E Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	39,618,212	3,061,382	10,367,558	26,189,272
Phase 2	37,078,300		2,347,661	34,730,639
Phase 3	50,431,798		2,759,853	47,671,945
Phase 4	60,147,604		1,073,418	59,074,186
	<b>187,275,914</b>	<b>3,061,382</b>	<b>16,548,490</b>	<b>167,666,042</b>

<b>Exhibit K Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	36,616,853	626,129	7,544,583	28,446,141
Phase 2	-	-	-	-
Phase 3	-	-	-	-
Phase 4	-	-	-	-
	<b>36,616,853</b>	<b>626,129</b>	<b>7,544,583</b>	<b>28,446,141</b>

<b>Finance Charge</b>					
	Exhibit E	Pro-Rata	Contract	DDP	Over Baseline
Phase 1	3,061,382	647,635	689,909	626,129	(21,506)
Finance Adjusted per Contract				49,618	28,112
Phase 2	-	606,115	645,679		
Phase 3		824,404	878,216		
Phase 4		983,228	1,047,407		
	3,061,382		3,261,211	675,747	<b>28,112</b>
Transfer to Sub Fund			149,776		
			3,111,435		
		Equipment	Charge	Factor	
		184,214,532	3,261,211	1.770%	

# DATA SHEET

<b>Subscriber Reconciliation</b>						
Exhibit E						
	Equip	Spares	Install	Total		
Phase 1	9,521,448	-	846,110	<b>10,367,558</b>		
Phase 2	2,202,211	-	145,450	<b>2,347,661</b>		
Phase 3	2,588,620	-	171,233	<b>2,759,853</b>		
Phase 4	1,004,195	-	69,223	<b>1,073,418</b>		
	15,316,474	-	1,232,016	<b>16,548,490</b>		
<b>Exhibit K</b>						
Phase 1	6,606,347	239,404	698,832	<b>7,544,583</b>		
Phase 2				-		
Phase 3				-		
Phase 4				-		
	6,606,347	239,404	698,832	<b>7,544,583</b>		
<b>Subscriber Orders</b>						
Desc	Origin	Equip	Install	Fin Chg	Total	Balance
						16,548,490
Phase 1 DDP List	P1DDP	7,346,152	742,001	0	8,088,153	8,460,337
Finance Charge Remaining Bal	(8,460,337)				-	149,776
Sub Total					-	8,610,113
					-	
MSP Order	CCN # 11	65,125	4,875	1,239	71,239	8,538,873
Spares	CCN # 11	393,604	27,105	7,448	428,157	8,110,717
DOC	CCN # 11	257,864	60,625	5,638	324,127	7,786,589
MA	CCN # 11	45,005	6,890	919	52,814	7,733,775
MSP	CCN # 12	141,743	10,920	2,703	155,366	7,578,410
DOC	CCN # 12	464,447	28,080	8,719	501,246	7,077,164
DEQ	CCN # 12	48,602	6,435	974	56,011	7,021,153
DNR	CCN # 12	214,888	35,462	4,432	254,782	6,766,371
					-	6,766,371
					-	6,766,371
					-	6,766,371
		8,977,430	922,393	32,073	9,931,896	6,766,371

# DATA SHEET

<b>Tower Adjustments</b>				
Phase 1	Tower	Building	Total	
1202	-	(31,160)	(31,160)	
1402	(163,898)	(31,160)	(195,058)	
1804	-	(30,780)	(30,780)	
1902	(66,267)	(30,780)	(97,048)	
2502	-	(31,683)	(31,683)	
3802	-	(31,684)	(31,684)	
5802	(247,850)	(24,953)	(272,803)	
1106	-	(26,471)	(26,471)	
1702	(217,992)	(19,368)	(237,360)	
1802	-	(30,780)	(30,780)	
2402	-	(21,635)	(21,635)	
2404	(143,879)	(21,635)	(165,514)	
2504	-	(25,395)	(25,395)	
3402	-	(16,845)	(16,845)	
3702	-	(8,619)	(8,619)	
6802	-	(30,803)	(30,803)	
1502	(37,064)	(21,202)	(58,266)	
2102	-	(18,513)	(18,513)	
2602	-	(22,200)	(22,200)	
2802	-	(21,628)	(21,628)	
3902	-	(20,621)	(20,621)	
5702	-	(20,954)	(20,954)	
Total P1	(876,951)	(538,872)	(1,415,823)	
<b>Phase 2</b>				
Total P2	-	-	-	
<b>Phase 3</b>				
Total P3	-	-	-	
<b>Phase 4</b>				
Total P4	-	-	-	
<b>Grand Total</b>				
	(876,951)	(538,872)	(1,415,823)	

# DATA SHEET

## Change Order Summary

Description	Chg No		Amount
	1		0
	2		0
	3		0
	4		0
Fuel Tanks and Telco	5		172,280
Greyhound facility changes	6		20,400
Add'l Ambassador Bds	6		13,810
X terminals at Disp	7		105,717
Encrypted DIU's	7		6,237
Console Logging Upgrade	7		29,494
2102 Sunk Costs	7		102,077
	8		-
	9		-
2102 Site Survey	10	2nd Site Investigation Survey for 2102 - Gravel Pit	16,464
2102 - Cost of Svcs performed	10		56,000
GPS Clock Source	10	Originally a Customer Responsibility	32,740
1202 - Raven Order Wire	10		2,958
Construction of Site 2102	12		156,070
			-
Change Order Summary			<b>714,247</b>

## Land Cost Summary

Phase One Land Purchase			873,813
Total			<b>873,813</b>

## NOTES

### Notes:

- 1 Baseline pricing from Exhibit E - Less Subscribers and Finance Charges
- 2 Total Contract Commitments from Exhibit K - Less Subscribers and Finance Charges
- 3 Described in section 1.35.9 in Contract
- 4 Baseline Functional Modification (Net)
- 5 Sum of all State of Michigan Baseline Requirement Adjustments
- 6 Additional State of Michigan Requirements
- 7 Additional Local User Requirements
- 8 Dollars required for Motorola to meet adjusted baseline requirements adjusted for adds;  
[B-(E+F+G)]
- 9 Total dollars for Motorola to meet adjusted baseline requirements; (Exhibit E minus; Adjustments for towers and buildings; plus Deletions; plus Net of Tower/Bldg Adjustments and land cost) [A-L+D+(L+M)]
- 10 No adjustments made for increased tower loading required as a result of local users
- 11 Variance between "Adjusted Baseline" dollars (J) and "Motorola's required dollars" from Exhibit K (H) [H-J]
- 12 The baseline price if \$187,275,915 represents the State's purchase price for the baseline functionality of the system as specified in Exhibit A of the contract  
Reductions in Baseline functionality result in corresponding reductions in the Baseline price  
Additional items or modifications and optional features ordered by the State shall be in addition to the Baseline Price

Phase 1R

Exhibit "K"					DDP Revised		MSP Order		MSP Spare Equip		Department of Corrections		Department of Military Affairs		MSP		DOC		DEQ		DNR		Total	
					(12/02/96)		(02/20/97)		(03/17/97)		(03/24/97)		(03/21/97)		Dec '97		Dec '97		Dec '97		Dec '97			
Description	origModel No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext
Vehicular Repeater	P2019	387	MOT	1 973	0						0													
Antenna	TAD6113	555	MOT	11	0						0													
VISAR High Band Portable	24 H05KDD9AA4_N	720	MOT	1 118	0						0													
ADD: 150.8 - 162 MHz Helical Antenna	H129	720	MOT		0						0													
ALT: Plastic Carry Holder with 2.5' belt clip	H306	720	MOT		0						0													
VISAR High Band Portable	H05KDD9AA4_N	720	MOT	1 118	0						0													
ADD: 150.8 - 162 MHz Helical Antenna	H129	720	MOT		0						0													
ALT: Plastic Carry Holder with 2.5' belt clip	H306	720	MOT		0						0													
DEL: charger & power cord	H951	721	MOT	(143)	0						0													
Dual Unit Rapid Charger (VISAR)	NTN1308	720	MOT	143	0						0													
Charger Line Cord (VISAR)	NTN7373	720	MOT	6	0						0													
120 Volt Rapid Charger (VISAR)	NTN7521	720	MOT	841	0						0													
VISAR Speaker / Mic	NMN6169	720	MOT	80	0						0													
Mobile Repeater	BXR2202	229	AIS	4 464																				
Body Worn Transmitter	TX922	229	AIS	1 562																				
Surveillance Unit	TX788	229	AIS	2 178																				
Delete Standard 800 MHz mobile antenna and installation				(14)	531	(7 471)																	531	(7 471)
Replace Standard 800 MHz mobile antenna				26	160	4 160																	160	4 160
SUBSCRIBER TOTAL					7,346,152		65,125		393,604		257,864		45,005		141,743		464,447		48,602		214,888		8,977,432	

	Qty	Applicable Fees		Qty	Applicable Fees		Qty	Applicable Fees		Qty	Applicable Fees		Qty	Applicable Fees		Qty	Applicable Fees		Qty	Applicable Fees		Applicable Units		
APCO 25 Trunking Upgrade	195	423	82 485	25	4 875	139	27 105	80	15 600	18	3 510	56	10 920	144	28 080	20	3 900	78	15 210	983	191 685			
Portable checkout/programming/inventory	58	916	53 128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	916	53 128			
Control station install (No spares)	75	83	6 225	0	0	0	0	45	3 375	4	300	0	0	0	0	3	225	4	300	139	10 425			
Control station antenna install	770	83	63 910	0	0	0	0	45	34 650	4	3 080	0	0	0	0	3	2 310	4	3 080	139	107 030			
Mobile Install (less Spares less Aircraft)	228	1 241	282 948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1315	299 820			
Aviation Installs	5 587	3	16 761	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	16 872	3	16 761		
Aviation Installs	39 424	6	236 544	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	236 544			
VRS/Visar Install	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
AVA Install	200	0	0	0	0	0	0	35	7 000	0	0	0	0	0	0	0	0	0	0	35	7 000			
Sub Total			742,001		4,875		27,105		60,625		6,890		10,920		28,080		6,435		35,462			922,393		
Section Total			8,088,153		70,000		420,709		318,489		51,895		152,663		492,527		55,037		250,350			9,899,823		
Finance Charge	1.77%				1 239		7 448		5 638		919		2 703		8 719		974		4 432			32 073		
Ex K Adj Baseline			8 088 153		8 159 393		8 587 550		8 911 677		8 964 491		9 119 856		9 621 103		9 677 114		9 931 896			9 931 896		
Unit Count (Subscriber Feature License Status)			2 290		25		139		80		18		56		144		20		78			2 850 (Total)		2 150 (Remaining)

Phase 1R

Exhibit "K"					DDP Revised		MSP Order		MSP Spare Equip		Department of Corrections		Department of Military Affairs		MSP		DOC		DEQ		DNR		Total	
					(12/02/96)		(02/20/97)		(03/17/97)		(03/24/97)		(03/21/97)		Dec '97		Dec '97		Dec '97		Dec '97			
Description	cnfig	Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	
Detachable Belt Clip		H301	310	MOT		393										6								399
Multi-Zone Operation		G358	310	MOT		393										6								399
Digital and Analog Operation		Q242	310	MOT		393										6								399
Remote Speaker Mic		NMN6234	310	MOT	126	0																		
Single Unit Rapid Charger		NTN4734	310	MOT	195	0												2	390					2 390
ASTRO Digital SABER Radio	22	H99DX			1 856	31	57 536			15	27 840	0						1	1 856					47 87 232
800 MHz, 3 Watt, Model III		214H			679	31	21 049			15	10 185							1	679					47 31 913
Enhanced Smartnet Operation		H38				31				15														46
Trunked ID Display		H14				31				15														46
Detachable Belt Clip		H301				31				15														46
Medium Capacity Battery		H224		MOT	(17)													1	(17)					1 (17)
Multi-Zone Operation		G358				31				15														46
Digital and Analog Operation		Q242				31				15														46
Remote Speaker Mic		NMN6234	310	MOT	126	0																		46
Single Unit Rapid Charger		NTN4734	310	MOT	195	0		25	4 875															25 4 875
ASTRO Digital SABER Radio	23	H99DX			1 856	13	24 128					0												13 24 128
800 MHz, 3 Watt, Model III		214H			679	13	8 827																	13 8 827
DES-XL Operation		W795			423	13	5 499																	13 5 499
Enhanced Smartnet Operation		H38				13																		13
Trunked ID Display		H14				13																		13
Detachable Belt Clip		H301				13																		13
Multi-Zone Operation		G358				13																		13
Digital and Analog Operation		Q242				13																		13
Remote Speaker Mic		NMN6234	310	MOT	126	0																		
Single Unit Rapid Charger		NTN4734	310	MOT	195	0																		
Remote Speaker Mic (SABER)	32	NMN6234 ?? (612	310	MOT	126	893	112 518			33	4 158	35	4 410											961 121 086
Antenna for Speaker Mic	32	NAF5002	256	MOT	15					33	495	35	523											68 1 020
Six Unit Multi-charger (SABER)	34	NTN4796	310	MOT	788	74	58 312					6	4 728											80 63 040
Single Unit Rapid Charger (SABER)	33	NTN4734	310	MOT	195	477	93 015			33	6 435	0		14	2 730									524 102 180
XTS-3000 Model III	37	H09UCH9PW7_N		MOT	1856											2	3 712							2 3 712
800 MHz		H214		MOT	679											2	1 358							2 1 358
DES-XL Operation		H795		MOT	423											2	846							2 846
Enhanced Smartnet		H38		MOT	0											2								2
Trunked ID Display		H14		MOT	0											2								2
Multi-Zone Operation		G358		MOT	0											2								2
Digital and Analog Operation		Q242		MOT	0											2								2
XTS-3000 Model III	38	H09UCF9PW7_N		MOT	1856											2	3 712			17	31 552			19 35 264
800 MHz				MOT	295											2	590			17	5 015			19 5 605
DES-XL Operation		H795		MOT	423											2	846							2 846
Enhanced Smartnet		H38		MOT	0											2				17				19
Trunked ID Display		H14		MOT	0											2				17				19
Multi-Zone Operation		G358		MOT	0											2				17				19
Digital and Analog Operation		Q242		MOT	0											2				17				19
Single Unit Rapid Charger		NTN1168		MOT	125											4	500			17	2 125			21 2 625
Astro Vehicle Adapter	35	NTN1143	465		545							35	19 070					253	137 847					288 156 917
Antenna - 800 MHz low loss line	35	RRA4983	555		35							35	1 229					253	8 880					288 10 109
UHF Connector	35	5880367B22			8							35	285					253	2 061					288 2 346
Medium Capacity- One unit	35	NTN4593	256		105							35	3 689											35 3 689
Medium Capacity- 2 thru 24 units	35	NTN4594			70																			
Medium Capacity- > 25 units	35	NTN4593			53													144	7 589					144 7 589
Keyloader - DES-XL	28	T3011_X	424	MOT	1 115	2	2 230					0												2 2 230
DIU Interface Cable		C542	424	MOT	30	2	59																	2 59
Spectra Interface Cable		C954	424	MOT	44	2	89																	2 89
Saber Interface Cable		C544	424	MOT	30	2	59																	2 59
Vehicle Repeater		P2019	387	MOT	1 973	0						0												
Antenna		TAD6113	555	MOT	11	0																		
Siren Interface Cable		G334	555	MOT		0																		

Phase 1R

Exhibit "K"					DDP Revised		MSP Order		MSP Spare Equip		Department of Corrections		Department of Military Affairs		MSP		DOC		DEQ		DNR		Total			
					(12/02/96)		(02/20/97)		(03/17/97)		(03/24/97)		(03/21/97)		Dec '97		Dec '97		Dec '97		Dec '97					
Description	onfig	Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	
Subscriber Feature License (Includes 5, 36	(5,000 Units)		3010	MOT	1 000 000	1	1 000 000																1	1 000 000		
Enhanced Smartnet Operation	G51/H38		3010	MOT		1																	1			
Trunked ID Display	G114/H14		3010	MOT		1																	1			
Multi-Zone	G358/G358		3010	MOT		1																	1			
<b>Astro Spectra</b>	1 T99DX		494	MOT	2 172	402	873 144			16	34 752		0										418	907 896		
800 MHz, 35 Watt A3	129W		494	MOT	679	402	272 958			16	10 864												418	283 822		
Remote Mount	W496		495	MOT	149	402	59 898			16	2 384												418	62 282		
DES-XL Operation	W795		494	MOT	423	402	170 046			16	6 768												418	176 814		
Enhanced Smartnet Operation	G51		494	MOT		402				16													418			
Trunked ID Display	G114		494	MOT		402				16													418			
10 Watt Audio	W432		494	MOT	10	402	4 020			16	160												418			
Multi-Zone Operation	G358		494	MOT		0				16													418	4 180		
																							16			
<b>Astro Spectra</b>	T99DX		494	MOT	2 172	0							0													
800 MHz, 35 Watt A3	129W		494	MOT	679	0																				
Remote Mount	W496		495	MOT	149	0																				
Enhanced Smartnet Operation	G51		494	MOT		0																				
Trunked ID Display	G114		494	MOT		0																				
10 Watt Audio	W432		494	MOT	10	0																				
Multi-Zone Operation	G358		494	MOT		0																				
<b>Astro Spectra</b>	5 T99DX		494	MOT	2 172	198	430 056			4	8 688		0		17	36 924							219	475 668		
800 MHz, 35 Watt A5	131W		494	MOT	79	198	15 642			4	316				17	1 343							219	17 301		
ASTRO Digital Operation	G242		412	MOT		198				4					17								219			
Enhanced Smartnet Operation	G51		494	MOT		198				4					17								219			
Trunked ID Display	G114		494	MOT		198				4					17								219			
10 Watt Audio	W432		494	MOT	10	198	1 980			4	40				17	170							219			
Multi-Zone Operation	G358		494	MOT		0				4					17								219	2 190		
																							21			
<b>Astro Spectra</b>	4 T99DX		494	MOT	2 172	221	480 012	25	54 300	16	34 752		0									9	19 548	271	588 612	
800 MHz, 35 Watt A5	131W		494	MOT	79	221	17 459	25	1 975	16	1 264											9	711	271	21 409	
Remote Mount	W496		495	MOT	149	221	32 929	25	3 725	16	2 384											9	1 341	271	40 379	
ASTRO Digital Operation	G242		412	MOT		221		25		16													9	271		
Enhanced Smartnet Operation	G51		494	MOT		221		25		16													9	271		
Trunked ID Display	G114		494	MOT		221		25		16													9	271		
10 Watt Audio	W432		494	MOT	10	221	2 210	25	250	16	160												9	271		
Multi-Zone Operation	G358		494	MOT		221		25		16												9	90	271	2 710	
																								262		
<b>Astro Spectra</b>	2 T99DX		494	MOT	2 172	415	901 380			16	34 752		0									65	141 180	496	1 077 312	
800 MHz, 35 Watt A5	131W		494	MOT	79	415	32 785			16	1 264											65	5 135	496	39 184	
Remote Mount	W496		495	MOT	149	415	61 835			16	2 384											65	9 685	496	73 904	
Siren/PA Module	W269		494	MOT	359	415	148 985			16	5 744											65	23 335	496	178 064	
ASTRO Digital Operation	G242		412	MOT		415				16													65	496		
Enhanced Smartnet Operation	G51		494	MOT		415				16													65	496		
Trunked ID Display	G114		494	MOT		415				16													65	496		
10 Watt Audio	W432		494	MOT	10	415	4 150			16	160												65	496		
Multi-Zone Operation	G358		494	MOT		0				16													65	650	496	4 960
																								16		
<b>Astro Spectra</b>	3 T99DX		494	MOT	2 172	7	15 204						0											7	15 204	
800 MHz, 35 Watt A5	131W		494	MOT	79	7	553																	7	553	
Remote Mount	W496		495	MOT	149	7	1 043																	7	1 043	
DES-XL Operation	W795		494	MOT	423	7	2 961																	7	2 961	
ASTRO Digital Operation	G242		412	MOT		7																		7		
Enhanced Smartnet Operation	G51		494	MOT		7																		7		
Trunked ID Display	G114		494	MOT		7																		7		
10 Watt Audio	W432		494	MOT	10	7	70																	7	70	
Multi-Zone Operation	G358		494	MOT		7																		7		
<b>Astro Spectra</b>	6 T99DX		494	MOT	2 172	24	52 128						0											24	52 128	
800 MHz, 35 Watt A7	132W		494	MOT	342	24	8 208																	24	8 208	
Remote Mount	W496		495	MOT	149	24	3 576																	24	3 576	
Siren/PA Module	W269		494	MOT	359	0																		24		
ASTRO Digital Operation	G242		412	MOT		24																		24		
Enhanced Smartnet Operation	G51		494	MOT		24																		24		
Trunked ID Display	G114		494	MOT		24																		24		
10 Watt Audio	W432		494	MOT	10	24	240																	24	240	

Phase 1R

Exhibit "K"					DDP Revised		MSP Order		MSP Spare Equip		Department of Corrections		Department of Military Affairs		MSP		DOC		DEQ		DNR		Total				
					(12/02/96)		(02/20/97)		(03/17/97)		(03/24/97)		(03/21/97)		Dec '97		Dec '97		Dec '97		Dec '97						
Description	onfigModel No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext			
Astro Spectra	10 T99DX	494	MOT	2 172	5	10 860					0												5	10 860			
800 MHz, 35 Watt A7	132W	494	MOT	342	5	1 710																	5	1 710			
Remote Mount	W496	495	MOT	149	5	745																	5	745			
Siren/PA Module	W269	494	MOT	359	0																						
DES-XL Operation	W795	494	MOT	423	5	2 115																	5	2 115			
ASTRO Digital Operation	G242	412	MOT		5																		5				
Enhanced Smartnet Operation	G51	494	MOT		5																		5				
Trunked ID Display	G114	494	MOT		5																		5				
10 Watt Audio	W432	494	MOT	10	5	50																	5	50			
Astro Spectra (Control Station)	8 T99DX	494	MOT	2 172	13	28 236					0												13	28 236			
DES-XL Operation	W795	494	MOT	423	13	5 499																	13	5 499			
800 MHz, 35 Watt A5	131W	494	MOT	79	13	1 027																	13	1 027			
ASTRO Digital Operation	G242	412	MOT		13																		13				
Enhanced Smartnet Operation	G51	494	MOT		13																		13				
Trunked ID Display	G114	494	MOT		13																		13				
Control Station Operation	W665	494	MOT	305	13	3 965																	13	3 965			
Astro Spectra (Control Station)	9 T99DX	494	MOT	2 172	70	152 040					0			4	8 688								74	160 728			
800 MHz, 35 Watt A5	131W	494	MOT	79	70	5 530								4	316								74	5 846			
ASTRO Digital Operation	G242	412	MOT		70									4									74				
Enhanced Smartnet Operation	G51	494	MOT		70									4									74				
Trunked ID Display	G114	494	MOT		70									4									74				
Control Station Operation	W665	494	MOT	305	70	21 350								4	1 220								74	22 570			
Astro Spectra (Control Station)	11 T99DX	494	MOT	2 172	0				14	30 408	0										3	6 516	17	36 924			
DES-XL Operation	W795	494	MOT	423	0				14	5 922													14	5 922			
800 MHz, 35 Watt A7	132W	494	MOT	342	0				14	4 788												3	1 026	17	5 814		
ASTRO Digital Operation	G242	412	MOT		0				14														3				
Enhanced Smartnet Operation	G51	494	MOT		0				14														3				
Trunked ID Display	G114	494	MOT		0				14														3				
Control Station Operation	W665	494	MOT	305	0				14	4 270													3	915			
Astro Spectra (Control Station)	12 T99DX	494	MOT	2 172	0				37	80 364	45	97 740				4	8 688						4	8 688	90	195 480	
800 MHz, 35 Watt A7	132W	494	MOT	342	0				37	12 654	45	15 390				4	1 368						4	1 368	90	30 780	
ASTRO Digital Operation	G242	412	MOT		0				37		45					4							4		90		
Enhanced Smartnet Operation	G51	494	MOT		0				37		45					4							4		90		
Trunked ID Display	G114	494	MOT		0				37		45					4							4		90		
Control Station Operation	W665	494	MOT	305	0				37	11 285	45	13 725				4	1 220						4	1 220	90	27 450	
9 db Yagi Antenna	25 TDF6556A	207	ADW	167	82	13 727					45	7 533		4	670		4	670				3	502	4	670	142	23 771
1/2" LDF Cable	L1705	207	ADW	1 5958	8 000	12 786					4503	7 181		400	638		400	638				300	479	400	638	14000	22 341
N-male Connector	TDN6677A	207	ADW	20	160	3 214					90	1 808		8	161		8	161				6	121	8	161	280	5 625
Lightning Arrestor	RRX4043A	207	ADW	36	80	2 879					45	1 620		4	144		4	144				3	108	4	144	140	5 039
Jumper											45			4			4					4		4		61	
AC Surge Suppressor	RLN4264	262	ADW	67	80	5 327					45	2 996		4	266		4	266				3	200	4	266	140	9 322
Grounding Kit	TDN6673A	207	ADW	15	80	1 161					45	653		4	58		4	58				3	44	4	58	140	2 031
ASTRO Digital SPECTRA Motorcycle R	7 M99DX	494	MOT	2 897	19	55 043					3	8 691				10	28 970							32	92 704		
W5 Rocker Select Control Head 15 Watts	W177	412	MOT	185	19	3 515					3	555				10	1 850							32	5 920		
ASTRO Digital Operation	G242	494	MOT		19						3					10								32			
SmartZone Operation	G51	494	MOT		19						3					10								32			
ENH: ID Display	G114	494	MOT		19						3					10								32			
ASTRO Digital SABER Radio	20 H99DX	310	MOT	1 856	479	889 024					18	33 408	35	64 960		14	25 984							561	1 041 216		
800 MHz, 3 Watt, Model II	212H	310	MOT	295	479	141 305					18	5 310	35	10 325		14	4 130							561	165 495		
Enhanced Smartnet Operation	H38	310	MOT		479						18		35			14								561			
Trunked ID Display	H14	310	MOT		479						18		35			14								561			
Detachable Belt Clip	H301	310	MOT		479						18		35			14								561			
Multi-Zone Operation	G358	310	MOT		0						18		35			14								561			
Digital and Analog Operation	Q242	310	MOT		479						18		35			14								82			
ASTRO Digital SABER Radio	21 H99DX	310	MOT	1 856	393	729 408										6	11 136		143	265 408				542	1 005 952		
800 MHz, 3 Watt, Model II	212H	310	MOT	295	393	115 935										6	1 770		143	42 185				542	159 890		
DES-XL Operation	W795	310	MOT	423	393	166 239										6	2 538							399	168 777		
Enhanced Smartnet Operation	H38	310	MOT		393											6								542			
Medium Capacity Battery	H224		MOT	(17)															143					542			
Trunked ID Display	H14	310	MOT		393											6			143	(2 431)				542	(2 431)		

STATE OF MICHIGAN  
 DEPARTMENT OF MANAGEMENT AND BUDGET  
 OFFICE OF PURCHASING  
 P.O. BOX 30026, LANSING, MI 48909  
 OR  
 530 W. ALLEGAN, LANSING, MI 48933

July 1, 1997

CHANGE NOTICE NO. 10 & 11  
 TO  
 CONTRACT AGREEMENT NO. 071B5000240  
 between  
 THE STATE OF MICHIGAN  
 and

NAME & ADDRESS OF VENDOR <b>Motorola, Inc.</b> <b>DBA/Motorola Communications &amp; Electronics, Inc.</b> <b>Attn: Martin J. Rogan</b> <b>1309 East Algonquin Road</b> <b>Schaumburg, IL 60196</b>		TELEPHONE <b>Martin J. Rogan</b> <b>(847) 538-6051</b>  <b>Christine Paul</b> <i>CPaul</i>
<b>800 MHz Radio System - Dept. of State Police</b>		
BPO PERIOD: 175 months		From: <b>December 8, 1994</b> To: <b>June 8, 2009</b>
TERMS <b>Net 30 Days</b>	SHIPMENT <b>As Specified Herein</b>	
F.O.B. <b>Delivered/Installed</b>	SHIPPED FROM <b>Various Locations</b>	
MINIMUM DELIVERY REQUIREMENTS <b>N/A</b>		

**NATURE OF CHANGE:**

Effective immediately, the attached modifications are hereby incorporated into this contract.

**AUTHORITY/REASON:**

Agency & AG's office request; vendor concurrence.

**TOTAL CONTRACT VALUE REMAINS: \$187,275,915.00**

**CONTRACT CHANGE NOTICE NO. 10  
TO THE  
STATE OF MICHIGAN  
800 MHZ RADIO SYSTEM & TELECOMMUNICATIONS BACKBONE NETWORK  
CONTRACT NO. 071B5000240  
BETWEEN  
THE STATE OF MICHIGAN  
AND MOTOROLA, INC.  
DATED DECEMBER 8, 1994**

Pursuant to the terms of Section 1.41 **General**, subparagraph B, the following modifications are hereby made:

- 1.) In Exhibit A., Section 6, delete the existing Section 6.12.3 and replace with the following revised language:

**6.12.3. Chargers**

The charger system shall be designed for Load Sharing Operation except in the circumstance of equipment load less than 10% of the combined charger capability, in which case a Hot Standby Mode may be utilized.

In Load Sharing Operation, the PCP charger system will be fully redundant with two chargers operating in parallel on a load sharing basis. Each charger will be capable of supplying full load when its redundant charger fails. The charger system will simultaneously supply full load current and charge a fully discharged battery. External timers will be supplied to automatically fully charge a battery within 24 hours.

In Hot Standby Mode, the PCP charger system will be fully redundant, operating with two chargers. Each charger will be capable of supplying full load current and charge a fully discharged battery. The Hot Standby Operation will take all the load off the secondary charger, except when the primary charger fails or is current limited and its voltage drops, in which case the standby rectifier will supply the full load as required. External timers will be supplied to automatically fully charge a battery within 24 hours.

Charger specifications are 1) Input Voltage: 120/208/240 Volts A.C., 2) Regulation: + - 5% with 10% A.C. Line Variance, 3) Environmental Conditions - Temperature: 0 to 5 degrees Celsius and Humidity: 95% non-condensing.

- 2.) In Exhibit A., Section 6, delete the existing Section 6.4 and replace with the following revised language:

#### 6.4. Special Requirements for Data Transmission

The TBN shall provide error correction and a synchronized network which shall eliminate bit slips in normal operation and provide a high quality BER of E10-6 during most microwave fades. Forward Error Correction (FEC) shall be provided using the Digital Data Service (DDS) 3-out-of-5 majority voting. The FEC shall be incorporated into the channel bank installed at every 800 MHz radio Site.

A master/slave timing control configuration shall be employed in the TBN to ensure that data and voice transmissions are synchronous. The synchronization shall be traced to a single source and sampling takes place at the same frequency throughout the network. Synchronous timing control shall be derived from a master supply, and distributed to each digital equipment location through a master and tributary-like network. Transmissions shall be both bit and byte synchronized.

The timing system shall prohibit phase jitter and phase hit propagation through the TBN. If branches of the timing distribution network became detached, the individual timing supplies shall have sufficient frequency accuracy in a free-running mode to continue service without interruption. However, occasional slips may occur between the severed parts.

Two types of connections occur in the Network: 1) Connection of a DACS over T1 carrier to the channel bank, and 2) Connection of a DACS over digital facilities directly into DACS. In the first connection, slips shall be prevented by forcing the transmitting portion of the remote channel bank to operate at the same clock rate as the internal clock rate of the DACS (known as channel bank loop timing). In the second connection, both DACS shall be forced to use a common synchronization reference clock rate. The synchronization clock of the Master DACS shall perform this process, and ensure that both digital systems will be part of a synchronized network.

The system synchronization shall employ a Modular Frequency/Time System (MFTS), by using signals from the universally-available Global Positioning System (GPS) to discipline high performance oscillators. The GPS Time Synchronization, traceable to universal time standards, shall be capable of utilizing a 48 VDC power source from the existing power supply used for the Telecommunications Backbone Equipment. The output frequency of the clock shall be 1.544 MHz. The clock output will be tied into the DACS equipment at each Master Site. Each Master Site will have its own GPS disciplined timing source. The Timing System shall have built in Fault monitoring for remote reporting via RS232 and an optional Fault Terminal Relay board with N.C., N.O. and Common connections. The GPS unit's stability is  $\pm 5 \times 10^{-13}$  while disciplined, and while undisciplined the unit shall maintain a stability of  $\pm 2 \times 10^{-11}$ .

The antenna shall be quadrafiler helix volute. The antenna unit shall be mounted in a configuration that will maintain the highest space vehicle availability. The GPS antenna, if mounted outside, will have a lightning arrestor installed per R56 Install Standards.

The output of each MFTS in each zone will feed the Primary and Secondary inputs of the master DACS in the associated zone. The zone shall then recover this clock for synchronization purposes via the T-1s. In the case of a GPS failure the Rubidium Oscillator will continue to keep synchronization until GPS tracking can be re-established. The Rubidium will maintain stability at  $\pm 2 \times 10^{-11}$  while free running (undisciplined). During a Rubidium Failure the Master DACS will revert back to its internal Stratum 3 free run clock. During Path failures the segregated (non master) DACS(s) in the same zone will then Free Run on their internal Stratum 3 Clock until the path is restored.

Clock Hierarchy is as follows: 1) Master Clock - Stratum-2 (1 slip every 132 hours), 2) Slave Clock - Stratum-3 (255 slips every 24 hours), and 3) Channel Bank - Stratum-4 (1 slip every 4 seconds).

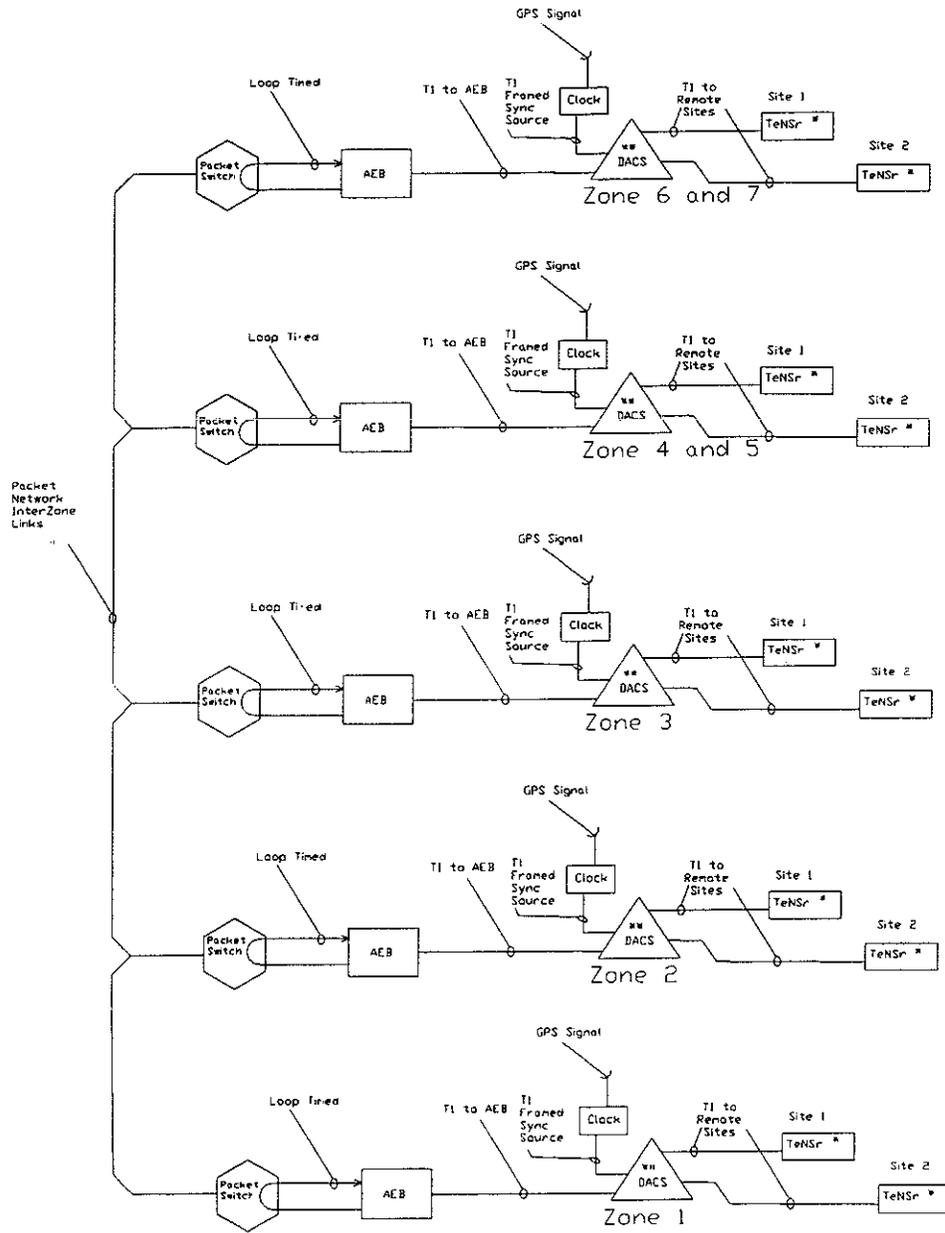
**Cost to Perform Recommended solution:**

## Equipment List:

1 Main frame, 3U Chassis	\$6,165.00
1 Model 8901 GPS Timing Module	3,000.00
1 Model 8902 DDS Rubidium Oscillator	7,000.00
1 Model 8904 Fault Sensing and Switching Unit	920.00
1 Model 8921 Power Supply Module -48VDC	2,500.00
1 Model 8911 Telecom Signal Generator T1 Framed	920.00
1 Option L11 100' Cable and Antenna	200.00
1 PolyPhaser 1.5 GHZ band TNC connectors	250.00
1 Mounting assembly and 2' mast	585.00
 Sub-total, Equipment	 \$21,540.00
 Installation, Optimization, Administration	 11,200.00

**Increase in the contract price is \$32,740.00**

This increase is within the \$187,275,915.00 set forth in Section 1.23



Notes

- \* All Channel Banks are configured for Loop Tied.
- \*\* Each Master DACS supports it's own Zone. All Inter Zone connections are made via Frame Relay. The clock is not recovered from the Inter Zone connection, rather it is regenerated locally by the Packet Switch.

Figure 6.6 Synchronization Diagram

- 3.) In conjunction Section 1.35.12-B., the following provides the description of completed task requirements, associated costs and payment schedule for Site 2102 Temporary Work Around Plan.

The unavailability of Site 2102, Addison Township, Oakland County, Michigan resulted in completing the balance of Phase 1 without this site, thereby requiring the following actions by Motorola.

Add the following as a new Section to the Phase One DDP, Exhibit B. Master Work Plan for the new Site 2102 (gravel pit) in the Cutover Plan:

**B.3.2 Temporary Work Around Plan for Site 2102 (gravel pit)**

**a) TEMPORARY STORAGE OF MATERIALS AND EQUIPMENT**

**Tower:** A 485' Self-Support as Manufactured by PIROD Inc. - Model # U-54SS

The tower components manufactured for site 2102, are stored at PiRod Inc., Plymouth, IN. in a disassembled manner, at no charge to the State of Michigan, with the agreement that PiRod have the liberty to utilize select members as required to meet manufacturing and shipping requirements. Thirty (30) day notice to PiRod is required prior to required ship date.

**Shelter:** A 12' x 28' "B" Size Equipment Shelter as Manufactured by Miller Telecom Services

The Equipment Shelter manufactured for site 2102, is stored at Miller Telecom Services, Elkhart IN., at no charge to the State of Michigan, and ready for delivery with a one (1) week notice.

**Microwave Equipment:**

The manufactured and staged Microwave equipment designed for site 2102, is stored at Motorola's service subcontractor, ComSource Inc., Rochester Hills, MI., at no charge to the State of Michigan, and ready for delivery with a one (1) week notice.

**800 MHz Equipment:**

The manufactured and staged 800 MHz equipment designed for site 2102, is stored at Motorola's service subcontractor, ComSource Inc., Rochester Hills, MI., at no charge to the State of Michigan, and ready for delivery with a one (1) week notice.

**b) TRAINING IMPACT - REFERENCE SITE 2102 ONLY**

All Phase 1 Dispatcher and Subscriber Operator training classes were provided with an overview and visual's, regarding the reduced radio system signal coverage in the Northeast portion of Oakland County, as an result of Site 2102 not being constructed as part of Phase 1 due to the pending legal suit.

**c) SCHEDULE IMPACT - TIME AND RESOURCES**

**Time:** \_\_\_\_\_ **Resources:**

- Re-routing 2402 & 2404 Site Links
- Re-program DACS Nodes
- Re-wire Cross-Connects

- Re-channelize System
- Re-route 2904 Console links
- Connection and verification of Site 1202 via State provided T1 in lieu of Microwave
- Management level resources required to effect successful "Work Around"

**d) PRICING IMPACT**

**I) Cost encumbrance for work performed prior to Injunction to Stop Work.**

A description of the work performed and associated cost was provided as part of Phase 1 completion, and therefore included in the Phase 1 invoice based on acceptance on December 20, 1996.

**II) Schedule Impact - Time and Resources Cost Effect**

Investment of Project Administration & Management, Systems Engineering and Systems Program Management services relative to the Phase 1 Temporary Work Around Plan for Site 2102.

**Cost for Services Performed is: \$56,000.00**

**III) Site 1202 (Holly) - Temporary Orderwire Extension and Phone-Set**

Provide and implement one (1) Raven Orderwire Extension and one (1) Orderwire Phone-Set at site 1202, allowing Orderwire capability at that site without requiring the 1202 to 2102 Microwave equipment to be active.

Equipment List	Model #	Cost (each)
1 - Raven Orderwire Extension	DSMW40610D600	\$1,425.00
1 - Raven Orderwire Phone-Set	DSMW250047MBA201	\$ 33.00
Equipment Cost Sub-Total:		\$1,458.00
<u>Implementation Services</u>		<u>Cost</u>
Installation and optimization		\$1,500.00
<b>Cost for Equipment and Services is:</b>		<b>\$2,958.00</b>

**e) PAYMENT SCHEDULE (EQUIPMENT)**

**I) 800 MHz Site Equipment:**

The 800 MHz System Equipment designed for site 2102, including antennas and lines, was inventoried by State of Michigan personnel as part of Phase 1 completion, and therefore included in the Phase 1 invoice based on acceptance on December 20, 1996. Related services to be re-quoted when a final site location is selected.

**II) TBN (microwave) and Alarm & Control Site Equipment:**

The TBN (microwave) System Equipment designed for site 2102, including antennas and lines, was inventoried by State of Michigan personnel as part of Phase 1 completion, and therefore included in the Phase 1 invoice based on acceptance on December 20, 1996. Related services to be re-quoted when a final site location is selected.

**III) Equipment Shelter:**

The "B" Size Equipment Shelter and 80 kW Generac Standby Generator designed for site 2102, was inventoried by State of Michigan personnel as part of Phase 1 completion, and therefore included in the Phase 1 invoice based on acceptance on December 20, 1996. Related services to be re-quoted when a final site location is selected.

**IV) Tower:**

The 485' Self-Support Tower Manufactured by PiROD Inc. will be invoiced for payment upon completion of tower construction, inventory and inspection acceptance. Related services to be re-quoted when a final site location is selected.

**V) Replacement Site:**

Upon written confirmation from the State to proceed with a mutually agreed replacement site, Motorola will provide a site specific quotation for services to construct and implement the site requirements, system equipment and remove the "Temporary Work Arounds" allowing the site to be integrated into the system as designed.

**f) WARRANTY**

**Tower:** A 485' Self-Support as Manufactured by PiROD Inc. - Model # U-54SS

The parts / labor warranty services required by contract will be provided from completion / site acceptance to the expiration of Phase 1 warranty on December 20, 1997 at 12:00 midnight. Parts only warranty service will continue on an exchange basis (standard warranty) for the balance of PiROD ten year Manufacturers warranty.

**Shelter:** A 12' x 28' "B" Size Equipment Shelter as Manufactured by Miller Telecom Services

The parts / labor warranty services required by contract will be provided from completion / site acceptance to the expiration of Phase 1 warranty on December 20, 1997 at 12:00 midnight. Parts only warranty service will continue on an exchange basis (standard warranty) for shelter components for the balance of time required to provide 12 months of total warranty. In conjunction with the warranty stated above Miller Telecom Services ten year structural warranty remains in effect for the balance of that period.

**Microwave and Alarm & Control Equipment:**

The parts / labor warranty services required by contract will be provided from completion / site acceptance to the expiration of Phase 1 warranty on December 20, 1997 at 12:00 midnight. Parts only warranty service will continue on an exchange basis (standard warranty) for the balance of time required to provide 12 months of total warranty.



6.) Replace Exhibit A Section 3.73 with the following new section:

**3.7.3. Aircraft Radio Requirements**

Motorola shall furnish and install FAA approved avionics style radios and antennas for three (3) MSP aircraft and "furnish only" three (3) avionics style radio's, for use as spares. These radio's must cover public safety FM bands from 37 MHz to 45 MHz, 152 MHz to 170 MHz, 420 MHz to 424 MHz, 451 MHz to 457 MHz, 460 MHz to 465 MHz and 806 MHz to 869 MHz. These radio's shall have full trunking capability on the bidder's 800 MHz system. Radio's shall have controls in standard aviation panel mount and receive and transmit audio furnished to avionics audio distribution system. Push to talk control shall be connected through avionics control system with switch on control yoke. These units must be Global Wulfsburg, Northern Airborne Technology Ltd., or approved equivalent. Installations shall be completed by A FAA certified service shop and supervised by A MSP Aircraft Maintenance Supervisor.

The State requires Motorola to work with manufactures of Aircraft Radios to interface their 800 MHz trunked radio with the audio, PTT circuits of the aircraft intercom control panel. The DC primary voltage for the six MSP aircraft is 24 VDC with negative ground. Motorola shall furnish six (6) 800 MHz trunked radio's, three (3) to be installed in conjunction with the Wulfsburg Avionics Radio and three (3) 800 MHz trunked radio, for use as spares.

**Cost Reduction to per Requested Change:**

**Installation:**

**(5,587.00 each)**

7 ) Add the following to the end of Exhibit A, Section 2, Paragraph 2.14.3. The pricing shall be added to Exhibit K as new items to the equipment list. The State agrees that for Phase I these items were purchased from a separate source of funds and are not part of the Baseline Requirements.

**Portable Accessories**

Vehicular charging of the Saber portable battery is required and will be accomplished using the Motorola PORTA-POCKET charger. The PORTA-POCKET charger provides a standard rate 16 hour charge.

The following table supplies ordering information to outfit users with the required charging options.

Model #	Description	State Price	Local Users Price
NTN5563	Single Unit, PORTA-POCKET charger with 110V AC power supply/cable	\$43.22	\$43.22
NKN6289	12 volt DC ignition wiring cable, includes dash mount bracket	\$11.00	\$11.00
NKN6290	12 volt cigarette lighter receptacle cable, includes dash mount bracket	\$11.00	\$11.00
NAF5042	Speaker Mic 1/4 wave antenna	\$15.00	\$15.00
NTN1143	Astro Vehicle Adapter	\$545.00	\$545.00
RRA4983	Antenna - 800 Mhz low loss line	\$35.00	\$35.00
5880367B22	UHF Connector	\$ 8.00	\$ 8.00
NTN4593	Medium Capacity Battery	\$105.00	\$105.00
N/A	AVA Install	\$200.00	N/A quote reqd.
H09UCF9PW7 N	ASTRO Digital XTS 3000 Model II	\$1,697.00	\$1,617.00

NOTE: Only one of the two listed 12 volt cables are required and should be chosen based on individual user requirements.

Unit prices do not include installation. An invoice will be presented on shipment of the equipment and payment shall be due within 30 days of invoice. Quoted pricing is valid for a duration one (1) year from the signing of the change order.

- 8 ) The pricing for Surveillance Equipment shall be added to Exhibit K as new items to the equipment list.

### Surveillance Accessories

The Saber portable will provide the end user the option to utilize surveillance or earpiece accessories.

The following tables supply the earpiece and surveillance accessories available for the Saber portable.

### Surveillance Accessories

Model #	Description	Price
ZMN6032 (*)	Earpiece, Mic and PTT combined	\$222.00
ZMN6031 (*)	Earpiece, Mic and PTT separate	\$222.00
NSN6050 (*)	Earpiece Assembly	\$27.12
NTN5664	Surveillance Accessory Adapter	\$63.56
NTN7767	ASTRO Antenna Adapter	\$0.00

NOTE: (\*) These items require both the NTN5664 and NTN7767.

### Earpiece Accessories

Model #	Description	Price
BDN6677 (**)	Std. Ear Microphone, Black	\$152.55
BDN6678 (**)	Std. Ear Microphone, Beige	\$152.55
BDN6642	ASTRO Push-to-Talk Interface Module	\$233.06

NOTE: (\*\*) These items require the BDN6642.

An invoice will be presented on shipment of the equipment and payment shall be due within 30 days of invoice. Quoted pricing is valid for a duration one (1) year from the signing of the change order.

9.) The following pricing shall be added to Exhibit K as new items to the equipment list.

The following table supplies the ordering information and pricing to provide the existing Zone Manager system with Security Partitioning.

Model	Description	Exhibit K
T5784	Zone Controller License Key	\$650
D62	Current Version of ASTRO Capable Software	\$4,225
D999	ENH: License, Security Partitioning	\$20,000
	Engineering, Install/Optimization, Admin	\$7,000

10.) In Exhibit C, Section 1 1.2 Testing Documentation, delete the balance of the last line of the second paragraph after the word "factory," and replace with the following:

- 4) Data sheets displaying the results of the specifications set during the manufacturing process, and
- 5) A record of items observed during the tests.

11.) In the Contract Terms and Conditions, add a new section 1.22.1. B., as follows:

**1.22.1.**

- B. The parties agree that note (3) of Exhibit E, Supplemental Price Sheet, for shipping and training for the units in excess of the BAFO quantities shall not apply to the DDP Phase 1 revised Subscriber List dated 12/2/96.

12.) In Exhibit E, Supplemental Price Sheet, Delete Line Item 28 Training (per subscriber). Delete existing note 3 and replace with following:

n3 - Charges for purchases outside the Baseline Subscriber Amount (BSA).

13.) The above changes have caused an impact on the contract price. A REVISED High Level Summary of Exhibit K, dated June 20, 1997 is attached with Contract Changes to date.

14.) All other terms and conditions shall remain unchanged.

---

THE STATE OF MICHIGAN

By: *Jerry Stuppel*  
(Signature)  
Name: Jerry Stuppel  
Title: Project Director  
Date: June 20, 1997

MOTOROLA, INC.

d/b/a Motorola Communications & Electronics, Inc.

By: *Chuck Cousins*  
(Signature)  
Name: CHUCK COUSINS  
Title: PROJ. DIR  
Date: 6/20/97

# MPSCS HIGH LEVEL SUMMARY

Phase	Baseline Variances							Baseline			Subscribers	
	A	B	C	D	E	F	G	H (B-(E,F,G))	J (A-L+D+(L-M))	K (H-J)	Orders	Balance
	Exhibit E Contract (1)	Exhibit K DDP's "Build To" (2)	Adi for Twr/Bldg Alterations (3)	SOM Scope Adjustments (5)	SOM Mod's (4)	SOM Additions (6)	Local Users Additions (7, 10)	\$\$ Req'd for MOI to go-EL req. (8)	Adjusted Baseline (9)	Variance to Available Baseline (11)		
<b>Phase 1</b>	26,189,272	28,446,141	1,415,823	(1,033,488)	476,207	2,659,686	859,792	24,440,456	24,281,971	158,485		
(L) Tower/Bldg adjustment												
(M) Land Cost			(873,813)									
<b>Phase 1 Sub Total</b>	26,189,272	28,446,141	542,010	(1,033,488)	476,207	2,659,686	859,792	24,440,456	24,281,971	158,485		
<b>Phase 2</b>	34,730,639	0										
<b>Phase 3</b>	47,671,945	0										
<b>Phase 4</b>	59,074,186	0										
<b>Infrastructure</b>	167,666,042	28,446,141	542,010			538,470						
Change Order Summary												
Finance Charge	3,061,382	675,747										
<b>Subs - Total Project</b>	16,548,490	7,544,538										
FinaneCharge												
Subscriber Fund Total												
Orders to date											8,088,153	16,548,490
												149,776
												16,698,266
												8,610,113
<b>Proi Total</b>	187,275,914	36,666,426	542,010	(1,033,488)	476,207	3,208,156	859,792	24,440,456	24,281,971	158,485	8,088,153	8,610,113

  
 June 20, 1997  
 5:16 PM

# VARIANCE SHEET

Descriptions			Base Line Variance			
	Old	New	SOM Scope Deletions	SOM Modifications	SOM Additions	Local Users
			D	E	F	G
1	11Y-MWR	1000				
2	40-MWR	1000				
3	20-MWR(D)	1000	(779,772)			
4	43Z	1001				
5	16T	1104		(32,817)		102,599
6		1108		209,137		
7	19	1202				17,717
8	14T	1402				
9	42H	1804				25,619
10	49	1902			9,827	8,912
11	25T	2502				24,900
12		2904		707,544		
13	30	3802				83,685
14		5802			13,691	
15	11T-MWR(D)	1106	(0)	(15,975)	157,976	
16	41X	1702				113,868
17	42	1802				25,727
18	23Z	2402			140,072	106,161
19	24X	2404			65,428	96,481
20	21T-MWR(D)	2504	(15,976)	(506,862)	18,368	32,152
21	29T	2902		41,530	11,645	
22		3402			153,973	
23	37	3702			50,519	
24	13B	6802			13,275	
25	14Z	1502				
26	27Z	2102			97,438	120,347
27	26Z	2602				28,403
28	28Z	2802				
29	39T	3902			119,968	
30	41Z	5702			29,054	
31	16I	1102		73,650	107,744	117,635
32	Fire Supression		(157,739)			
33	Report Integrator		(40,000)			
34	T1 Bulk Encryptors		(40,000)			
35	Customer Selected Options				1,680,708	
	Adjust LU to match Documentation					(44,413)
	Totals		(1,033,488)	476,207	2,669,686	859,792

# DATA SHEET

<b>Exhibit E Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	39,618,212	3,061,382	10,367,558	26,189,272
Phase 2	37,078,300		2,347,661	34,730,639
Phase 3	50,431,798		2,759,853	47,671,945
Phase 4	60,147,604		1,073,418	59,074,186
	<b>187,275,914</b>	<b>3,061,382</b>	<b>16,548,490</b>	<b>167,666,042</b>

<b>Exhibit K Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	36,616,853	626,129	7,544,583	28,446,141
Phase 2	-	-	-	-
Phase 3	-	-	-	-
Phase 4	-	-	-	-
	<b>36,616,853</b>	<b>626,129</b>	<b>7,544,583</b>	<b>28,446,141</b>

<b>Finance Charge</b>					
	Exhibit E	Pro-Rata	Contract	DDP	Over Baseline
Phase 1	3,061,382	647,635	689,909	626,129	(21,506)
Finance Adjusted per Contract				49,618	28,112
Phase 2	-	606,115	645,679		
Phase 3		824,404	878,216		
Phase 4		983,228	1,047,407		
	3,061,382		3,261,211	675,747	<b>28,112</b>
Transfer to Sub Fund			149,776		
			3,111,435		
		Equipment	Charge	Factor	
		184,214,532	3,261,211	1.770%	



# DATA SHEET

<b>Tower Adjustments</b>				
Phase 1	Tower	Building	Total	
1202	-	(31,160)	(31,160)	
1402	(163,898)	(31,160)	(195,058)	
1804	-	(30,780)	(30,780)	
1902	(66,267)	(30,780)	(97,048)	
2502	-	(31,683)	(31,683)	
3802	-	(31,684)	(31,684)	
5802	(247,850)	(24,953)	(272,803)	
1106	-	(26,471)	(26,471)	
1702	(217,992)	(19,368)	(237,360)	
1802	-	(30,780)	(30,780)	
2402	-	(21,635)	(21,635)	
2404	(143,879)	(21,635)	(165,514)	
2504	-	(25,395)	(25,395)	
3402	-	(16,845)	(16,845)	
3702	-	(8,619)	(8,619)	
6802	-	(30,803)	(30,803)	
1502	(37,064)	(21,202)	(58,266)	
2102	-	(18,513)	(18,513)	
2602	-	(22,200)	(22,200)	
2802	-	(21,628)	(21,628)	
3902	-	(20,621)	(20,621)	
5702	-	(20,954)	(20,954)	
<b>Total P1</b>	<b>(876,951)</b>	<b>(538,872)</b>	<b>(1,415,823)</b>	
<b>Phase 2</b>				
<b>Total P2</b>	-	-	-	
<b>Phase 3</b>				
<b>Total P3</b>	-	-	-	
<b>Phase 4</b>				
<b>Total P4</b>	-	-	-	
<b>Grand Total</b>				
<b>Grand Total</b>	<b>(876,951)</b>	<b>(538,872)</b>	<b>(1,415,823)</b>	



## NOTES

### Notes:

- 1 Baseline pricing from Exhibit E - Less Subscribers and Finance Charges
- 2 Total Contract Commitments from Exhibit K - Less Subscribers and Finance Charges
- 3 Described in section 1.35 9 in Contract
- 4 Baseline Functional Modification (Net)
- 5 Sum of all State of Michigan Baseline Requirement Adjustments
- 6 Additional State of Michigan Requirements
- 7 Additional Local User Requirements
- 8 Dollars required for Motorola to meet adjusted baseline requirements adjusted for adds;  
[B-(E+F+G)]
- 9 Total dollars for Motorola to meet adjusted baseline requirements; (Exhibit E minus; Adjustments for towers and buildings; plus Deletions; plus Net of Tower/Bldg Adjustments and land cost) [A-L+D+(L+M)]
- 10 No adjustments made for increased tower loading required as a result of local users
- 11 Variance between "Adjusted Baseline" dollars (J) and "Motorola's required dollars" from Exhibit K (H) [H-J]
- 12 The baseline price if \$187,275,915 represents the State's purchase price for the baseline functionality of the system as specified in Exhibit A of the contract.  
Reductions in Baseline functionality result in corresponding reductions in the Baseline price.  
Additional items or modifications and optional features ordered by the State shall be in addition to the Baseline Price

# Subscriber Quantities Tracking Sheet

Exhibit "K"										DDP Revised (12/02/96)		Next Order		Total	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext			
K	Subscriber Feature License (Includes 5,0 36 (5,000 Units)	3010	MOT	1,000,000	1	1,000,000			1		1	1,000,000			
K	Enhanced Smartnet Operation	3010	MOT		1				1		1				
K	Trunked ID Display	3010	MOT		1				1		1				
K	Multi-Zone	3010	MOT		1				1		1				
K	<b>Astro Spectra</b>														
K	800 MHz, 35 Watt, A3	494	MOT	2,172	402	873,144			402		402	873,144			
K	<b>Remote Mount</b>														
K	Enhanced Smartnet Operation	494	MOT	679	402	272,958			402		402	272,958			
K	Trunked ID Display	495	MOT	149	402	59,898			402		402	59,898			
K	<b>DES-XL Operation</b>														
K	Enhanced Smartnet Operation	494	MOT	423	402	170,046			402		402	170,046			
K	Trunked ID Display	494	MOT		402				402		402				
K	10 Watt Audio	494	MOT	10	402	4,020			402		402	4,020			
K	Multi-Zone Operation	494	MOT		0				0		0				
K	<b>Astro Spectra</b>														
K	800 MHz, 35 Watt, A3	494	MOT	2,172	0				0		0				
K	<b>Remote Mount</b>														
K	Enhanced Smartnet Operation	494	MOT	679	0				0		0				
K	Trunked ID Display	495	MOT	149	0				0		0				
K	10 Watt Audio	494	MOT	10	0				0		0				
K	Multi-Zone Operation	494	MOT		0				0		0				
K	<b>Astro Spectra</b>														
K	800 MHz, 35 Watt, A5	494	MOT	2,172	198	430,056			198		198	430,056			
K	<b>ASTRO Digital Operation</b>														
K	Enhanced Smartnet Operation	494	MOT	79	198	15,642			198		198	15,642			
K	Trunked ID Display	412	MOT		198				198		198				
K	10 Watt Audio	494	MOT	10	198	1,980			198		198	1,980			
K	Multi-Zone Operation	494	MOT		0				0		0				
K	<b>Astro Spectra</b>														
K	800 MHz, 35 Watt, A5	494	MOT	2,172	221	480,012			221		221	480,012			
K	<b>Remote Mount</b>														
K	ASTRO Digital Operation	494	MOT	79	221	17,459			221		221	17,459			
K	Enhanced Smartnet Operation	495	MOT	149	221	32,929			221		221	32,929			
K	Trunked ID Display	412	MOT		221				221		221				
K	10 Watt Audio	494	MOT	10	221	2,210			221		221	2,210			
K	Multi-Zone Operation	494	MOT		221				221		221				

  
 Page 8 of 14  
 June 20, 1997  
 5:16 PM

# Subscriber Quantities Tracking Sheet

Exhibit "K"										DDP Revised (12/02/96)		Next Order		Total	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext			
K	Trunked ID Display	494	MOT								221				
K	10 Watt Audio	494	MOT	10		2,210					221	2,210			
K	Multi-Zone Operation	494	MOT								221				
K	<b>Astro Spectra</b>	494	MOT	2,172		901,380					415	901,380			
K	800 MHz, 35 Watt, A5	494	MOT	79		32,785					415	32,785			
K	<b>Remote Mount</b>	495	MOT	149		61,835					415	61,835			
K	<b>Siren/PA Module</b>	494	MOT	359		148,985					415	148,985			
K	ASTRO Digital Operation	412	MOT								415				
K	Enhanced Smartnet Operation	494	MOT								415				
K	Trunked ID Display	494	MOT								415				
K	10 Watt Audio	494	MOT	10		4,150					415	4,150			
K	Multi-Zone Operation	494	MOT								0				
K	<b>Astro Spectra</b>	494	MOT	2,172		15,204					7	15,204			
K	800 MHz, 35 Watt, A5	494	MOT	79		553					7	553			
K	<b>Remote Mount</b>	495	MOT	149		1,043					7	1,043			
K	<b>DES-XL Operation</b>	494	MOT	423		2,961					7	2,961			
K	ASTRO Digital Operation	412	MOT								7				
K	Enhanced Smartnet Operation	494	MOT								7				
K	Trunked ID Display	494	MOT								7				
K	10 Watt Audio	494	MOT	10		70					7	70			
K	Multi-Zone Operation	494	MOT								7				
K	<b>Astro Spectra</b>	494	MOT	2,172		52,128					24	52,128			
K	800 MHz, 35 Watt, A7	494	MOT	342		8,208					24	8,208			
K	<b>Remote Mount</b>	495	MOT	149		3,576					24	3,576			
K	<b>Siren/PA Module</b>	494	MOT	359							0				
K	ASTRO Digital Operation	412	MOT								24				
K	Enhanced Smartnet Operation	494	MOT								24				
K	Trunked ID Display	494	MOT								24				
K	10 Watt Audio	494	MOT	10		240					24	240			
K	<b>Astro Spectra</b>	494	MOT	2,172		10,860					5	10,860			
K	800 MHz, 35 Watt, A7	494	MOT	342		1,710					5	1,710			

  
 Page 9 of 14  
 June 20, 1997  
 5:16 PM

# Subscriber Quantities Tracking Sheet

Exhibit "K"										DDP Revised (12/02/96)		Next Order		Total	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext			
K Remote Mount	W496	495	MOT	149	5	745			5	745					
K Siren/PA Module	W269	494	MOT	359	0										
K DES-XL Operation	W795	494	MOT	423	5	2,115			5	2,115					
K ASTRO Digital Operation	G242	412	MOT		5				5						
K Enhanced Smartnet Operation	G51	494	MOT		5				5						
K Trunked ID Display	G114	494	MOT		5				5						
K 10 Watt Audio	W432	494	MOT	10	5	50			5	50					
K Astro Spectra (Control Station)	8 T99DX	494	MOT	2,172	13	28,236			13	28,236					
K DES-XL Operation	W795	494	MOT	423	13	5,499			13	5,499					
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	13	1,027			13	1,027					
K ASTRO Digital Operation	G242	412	MOT		13				13						
K Enhanced Smartnet Operation	G51	494	MOT		13				13						
K Trunked ID Display	G114	494	MOT		13				13						
K Control Station Operation	W665	494	MOT	305	13	3,965			13	3,965					
K Astro Spectra (Control Station)	9 T99DX	494	MOT	2,172	70	152,040			70	152,040					
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	70	5,530			70	5,530					
K ASTRO Digital Operation	G242	412	MOT		70				70						
K Enhanced Smartnet Operation	G51	494	MOT		70				70						
K Trunked ID Display	G114	494	MOT		70				70						
K Control Station Operation	W665	494	MOT	305	70	21,350			70	21,350					
K Astro Spectra (Control Station)	11 T99DX	494	MOT	2,172	0				0						
K DES-XL Operation	W795	494	MOT	423	0				0						
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	0				0						
K ASTRO Digital Operation	G242	412	MOT		0				0						
K Enhanced Smartnet Operation	G51	494	MOT		0				0						
K Trunked ID Display	G114	494	MOT		0				0						
K Control Station Operation	W665	494	MOT	305	0				0						
K Astro Spectra (Control Station)	12 T99DX	494	MOT	2,172	0				0						
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	0				0						
K ASTRO Digital Operation	G242	412	MOT		0				0						
K Enhanced Smartnet Operation	G51	494	MOT		0				0						

  
 Page 10 of 14  
 June 20, 1997  
 5:16 PM

# Subscriber Quantities Tracking Sheet

Exhibit "K"										DDP Revised (12/02/96)		Next Order		Total	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext			
K Trunked ID Display	G114	494	MOT			0									
K Control Station Operation	W665	494	MOT	305		0									
K 9 db Yagi Antenna	25 TDF6556A	207	ADW	167		13,727			82		13,727				
K 1/2" LDF Cable	L1705	207	ADW	1,5958		12,766			8000		12,766				
K N-male Connector	TDN6677A	207	ADW	20		3,214			160		3,214				
K Lightning Arrestor	RRX4043A	207	ADW	36		2,879			80		2,879				
11 Jumper															
K AC Surge Suppressor	RLN4264	262	ADW	67		5,327			80		5,327				
K Grounding Kit	TDN6673A	207	ADW	15		1,161			80		1,161				
K ASTRO Digital SPECTRA Motorcycle R	M99DX	494	MOT	2,897		55,043			19		55,043				
K W5 Rocker Select Control Head 15 Watts	W177	412	MOT	185		3,515			19		3,515				
K ASTRO Digital Operation	G242	494	MOT						19						
K SmartZone Operation	G51	494	MOT						19						
K ENH: ID Display	G114	494	MOT						19						
K ASTRO Digital SABER Radio	H99DX	310	MOT	1,856		889,024			479		889,024				
K 800 MHz, 3 Watt, Model II	212H	310	MOT	295		141,305			479		141,305				
K Enhanced Smartnet Operation	H38	310	MOT						479						
K Trunked ID Display	H14	310	MOT						479						
K Detachable Belt Clip	H301	310	MOT						479						
K Multi-Zone Operation	G358	310	MOT						479						
K Digital and Analog Operation	Q242	310	MOT						479						
K ASTRO Digital SABER Radio	H99DX	310	MOT	1,856		729,408			393		729,408				
K 800 MHz, 3 Watt, Model II	212H	310	MOT	295		115,935			393		115,935				
K DES-XL Operation	W795	310	MOT	423		166,239			393		166,239				
K Enhanced Smartnet Operation	H38	310	MOT						393						
K Trunked ID Display	H14	310	MOT						393						
K Detachable Belt Clip	H301	310	MOT						393						
K Multi-Zone Operation	G358	310	MOT						393						
K Digital and Analog Operation	Q242	310	MOT						393						
K Remote Speaker Mic	NMN6234	310	MOT	126					0						
K Single Unit Rapid Charger	NTN4734	310	MOT	195					0						

# Subscriber Quantities Tracking Sheet

Exhibit "K"		onfig Model No	APC	Manut	Unit	Qty	Ext	Qty	Ext	Qty	Total
Description											
K	ASTRO Digital SABER Radio	22	H99DX		1,856	31	57,536	31	57,536	31	57,536
K	800 MHz, 3 Watt, Model III		214H		679	31	21,049	31	21,049	31	21,049
K	Enhanced Smartnet Operation		H38			31		31		31	
K	Trunked ID Display		H14			31		31		31	
K	Detachable Belt Clip		H301			31		31		31	
K	Multi-Zone Operation		G358			31		31		31	
K	Digital and Analog Operation		Q242			31		31		31	
K	Remote Speaker Mic		NMN6234	310	126	0		0		0	
K	Single Unit Rapid Charger		NTN4734	310	195	0		0		0	
K	ASTRO Digital SABER Radio	23	H99DX		1,856	13	24,128	13	24,128	13	24,128
K	800 MHz, 3 Watt, Model III		214H		679	13	8,827	13	8,827	13	8,827
K	DES-XL Operation		W795		423	13	5,499	13	5,499	13	5,499
K	Enhanced Smartnet Operation		H38			13		13		13	
K	Trunked ID Display		H14			13		13		13	
K	Detachable Belt Clip		H301			13		13		13	
K	Multi-Zone Operation		G358			13		13		13	
K	Digital and Analog Operation		Q242			13		13		13	
K	Remote Speaker Mic		NMN6234	310	126	0		0		0	
K	Single Unit Rapid Charger		NTN4734	310	195	0		0		0	
K	Remote Speaker Mic (SABER)	32	NMN6234 ?? (612	310	126	893	112,518	893	112,518	893	112,518
9	Antenna for Speaker Mic	32	NAF5002	256	15						
K	Six Unit Multi-charger (SABER)	34	NTN4796	310	788	74	58,312	74	58,312	74	58,312
K	Single Unit Rapid Charger (SABER)	33	NTN4734	310	195	477	93,015	477	93,015	477	93,015
11	Astro Vehicle Adapter	35	NTN1143	465	545						
11	Antenna - 800 MHz low loss line	35	RRA4983	555	35						
11	UHF Connector	35	5880367B22		8						
11	Medium Capacity	35	NTN4593	256	105						
K	Keyloader - DES-XL	28	T3011_X	424	1,115	2	2,230	2	2,230	2	2,230
K	DIU Interface Cable		C542	424	30	2	59	2	59	2	59

  
 Page 12 of 14  
 June 20, 1997  
 5:16 PM  
 CTC





**CONTRACT CHANGE NOTICE NO. 11  
TO THE  
STATE OF MICHIGAN  
800 MHZ RADIO SYSTEM & TELECOMMUNICATIONS BACKBONE NETWORK  
CONTRACT NO. 071B5000240  
BETWEEN  
THE STATE OF MICHIGAN  
AND MOTOROLA, INC.  
DATED DECEMBER 8, 1994**

Pursuant to the terms of Section 1.41 **General**, subparagraph B, the following modifications are hereby made:

1.) In Section 1.1 Definitions, add the following definitions:

- 52. Infrastructure: Shall mean 800 MHz Radio System equipment consisting of Central and Fixed equipment, TBN equipment, Facilities, and associated Administrative, Installation, and Shipping charges.
- 53. Subscribers: Shall mean 800 MHz Radio System equipment consisting of mobiles, vehicular repeater systems, VHF portables, 800 MHz portables, control stations, associated antenna systems, accessories, and associated Administrative, Installation, and Shipping charges.
- 54. Facilities: Shall mean the Sites & Site Preparation, Prefabricated Buildings, Towers, and Grounding and Lightning and Surge Protection, as detailed in Exhibit A; Sections 8, 9, 10, and 11.
- 55. Renovations and Additions: Shall mean construction, modifications to existing facilities or structures, identified by the State.
- 56. Central Equipment: Shall mean system controllers, system managers (TMS & PMS), audio switches, packet switches associated with the 800 MHz Radio System.
- 57. Fixed Equipment: Shall mean repeaters, site control, and dispatch consoles of the 800 MHz Radio System.
- 58. TBN Equipment: Shall mean microwave, multiplex, alarm and control (ACS & DMS) of the TBN.
- 59. Site Development: Shall mean the per site clearing, rough grading, and installation of the access road, tower and shelter foundations as outlined in Exhibit A; Sections 8, 9, 10, and 11.
- 60. Tower and Prefabricated Building Installation: Shall mean the tower erection, microwave and 800 MHz antenna systems installation, and placement of the prefabricated building on foundations at a site as outlined in Exhibit A; Sections 8, 9, 10, and 11.
- 61. Final Site Development: Shall mean the completion of site restoral, application of final aggregate surfacing, installation of all fencing and site grounding, complete installation

and operation of all prefabricated building systems, grounding and lightning protection systems, and emergency power systems as outlined in Exhibit A; Sections 8, 9, 10, and 11.

62. **Baseline Subscriber Amount (BSA):** Shall mean the total amount (\$16,698,266.00) of the contract price for Subscriber units, and includes the associated finance charge. The associated finance charge (\$149,776.00) is for units ordered after the Phase 1 DDP.

2.) Replace Section 1.22, Release of Work with the following new Section 1.22:

**1.22.1 System Infrastructure**

**1.22.1.1 Notice to Proceed**

- A. Prior to the start of the System implementation for each phase, the State Project Director shall issue to Motorola a written Notice to Proceed (NTP). This NTP shall initiate the Detailed Design Review process for the System Infrastructure. Upon completion of the Detailed Design Review process, a Detailed Design Plan shall be published by Motorola and signed by the State Project Director and the Motorola Project Director.

**1.22.1.2 Release of Work - System Infrastructure**

- A. The State Project Director will issue Contract Releases in the form of Purchase Orders as it's written authorization for the installation and implementation of the System Infrastructure. Purchase Orders issued by the State shall be deemed to be issued in accordance with the terms and conditions of this Contract, whether or not such purchase orders specifically reference this Contract. Any terms and conditions printed on the face of or on the back of the State's Purchase Order form shall be void and shall have no force or effect on Motorola. The Purchase Orders shall particularly describe the System, equipment, services, and amount of payment on a per Site basis, in accordance with Exhibit E and will have as an attachment the Detailed Design Plan, if applicable. Implementation of the System Infrastructure shall be in accordance with Exhibit D. Purchase Orders will serve as the authority for Motorola to manufacture, construct, implement, and invoice for the System Infrastructure components described therein.
- B. Contract Releases shall be subject to written acceptance or rejection by Motorola within thirty (30) days after receipt by Motorola's Contract Manager.

**1.22.2 Subscriber Equipment**

**1.22.2.1 Lump Sum Pricing**

- A. The State shall order Subscriber equipment against the Baseline Subscriber Amount (BSA) during the contract period, unless otherwise designated and purchased as additional equipment not contemplated in the original Subscriber amount. For designated Subscriber units outside the BSA, administrative and shipping charges detailed in Exhibit "E" Supplemental Price Sheet Note (3) will apply. For purchases outside the BSA, payment terms agreed to by the Parties at the time of purchase shall apply.

**1.22.2.2 Subscriber Unit Ordering**

- A. Subscriber units will be purchased by the State by issuing Purchase Orders. Purchase Orders issued by the State shall be deemed to be issued in accordance with the terms and conditions of this Contract, whether or not such purchase orders specifically reference this Contract. Any terms and conditions printed on the face of or on the back of the State's Purchase Order form shall be void and shall have no force or effect on Motorola.
- B. The parties agree that note (3) Exhibit E Supplemental Price Sheet, for shipping and training for the units in excess of the BAFO quantities shall not apply to the DDP Phase 1 revised Subscriber List dated 12/2/96.
- C. Subscriber units required in the cutover of a particular phase defined in the appropriate DDP will be ordered by the State within 30 days after the completion of the 800 MHz equipment Factory Acceptance testing for that phase.

3.) In Section 1.23. Paragraph G change the second sentence to read as follows:

If the per phase baseline System costs are adjusted in the DDP or subsequent Contract Releases for each phase, then the associated per phase System carry charges shall be adjusted proportionally and paid at the time of invoicing.

4.) In Exhibit D, Schedule, replace Sections 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, and 1.2.6 with the following:

**1.2.1. 800 MHz Radio System - Central and Fixed Equipment**

- 1. **Installation Milestone:** Equipment is manufactured, successfully completed Factory Testing as described in Exhibit C, installed and inventoried by the State at the State's installation Sites.
- 2. **Integration Milestone:** Equipment is powered, programmed, aligned, and optimized to work within a District. Successful completion and Acceptance of Field Specification Tests within a District as described in Exhibit C.
- 3. **Phase Acceptance Milestone:** Successful completion and Acceptance of the Field Functional & Operational Tests, and the Phase Acceptance Tests as described in Exhibit C, and resolution of installation Site delays as mutually agreed to by both Parties.
- 4. **Statewide System Acceptance Milestone:** Successful completion and Acceptance of Final Statewide System Acceptance Tests as described in Exhibit C and delivery of all as-built documentation.

### 1.2.2 Subscriber Equipment

1. **Installation Milestone:** Equipment is inventoried by the State, and installed at the State's designated Sites, in designated vehicles, or delivered to the State's designated location.
2. **Statewide System Acceptance Milestone:** Successful completion and Acceptance of Final Statewide System Acceptance Tests as described in Exhibit C and delivery of all as-built documentation.

### 1.2.3 TBN Equipment

1. **Installation Milestone:** Equipment is manufactured, successfully passed Factory Testing as described in Exhibit C, and inventoried by the State, and is installed at the State's installation Sites.
2. **Integration Milestone:** Equipment is powered, programmed, aligned, and optimized to work within a District. Successful completion and Acceptance of Field Specification Tests as described in Exhibit C Testing and Acceptance.
3. **Phase Acceptance Milestone:** Successful completion and Acceptance of Field Functional/Operational Tests for TBN Equipment and Field Functional/Operational Tests and Specification Tests for Network Management Equipment and the Phase Acceptance Tests as described in Exhibit C.
4. **Statewide System Acceptance Milestone:** Successful completion and Acceptance of Final Statewide System Acceptance Tests as described in Exhibit C and delivery of all as-built documentation.

### 1.2.4 Facilities

1. **Site Development Milestone:** Completion of the per site clearing , rough grading, and installation of the access road, tower and shelter foundations as outlined in Exhibit A Sections 8, 9, 10, and 11.
2. **Tower and Prefabricated Building Installation Milestone:** Completion of: Tower erection, microwave and 800 MHz antenna systems installation, and placement of the prefabricated building on foundations at a site as detailed in Exhibit A Sections 8, 9, 10, and 11, and inventoried by the State.
3. **Final Site Development Milestone:** Completion of: Site restoral, application of final aggregate surfacing, installation of all fencing and site grounding, installation and operation of all prefabricated building systems, grounding and lightning protection systems, and emergency power systems as detailed in Exhibit A Sections 8, 9, 10, and 11, and inventoried by the State.
4. **Phase Acceptance Milestone:** Successful completion and Acceptance of the Field Functional and Operational Tests, and the Phase Acceptance Tests as described in Exhibit C.

5. **Statewide System Acceptance Milestone:** Successful completion and Acceptance of Final Statewide System Acceptance Tests as described in Exhibit C and delivery of all as-built documentation.
- 5.) The above changes have caused an impact on the contract price. A REVISED High Level Summary of Exhibit K, dated June 20, 1997 is attached with Contract Changes to date.
- 6.) All other terms and conditions shall remain unchanged.
- 

THE STATE OF MICHIGAN

By: Jeff Steffel  
(Signature)

Name: JEFF STEFFEL

Title: PROJECT DIRECTOR

Date: June 20, 1997

MOTOROLA, INC.

d/b/a Motorola Communications & Electronics, Inc.

By: Chuck Consino  
(Signature)

Name: CHUCK CONSINO

Title: PROJ. DIR.

Date: 6/20/97

# MPSCS HIGH LEVEL SUMMARY

Phase	Baseline Variances					Baseline			Subscribers			
	A	B	C	D	E	F	G	H (B-(E,F,G))	J (A-L+D+(L-M))	K (H-J)	Orders	Balance
	Exhibit E Contract (1)	Exhibit K DDP's "Build To" (2)	Adj for Twr/Bldg Alterations (3)	SOM Scope Adjustments (5)	SOM Mod's (4)	SOM Additions (6)	Local Users Additions (7,10)	Req for MOT to do BL req (8)	Adjusted Baseline (9)	Variance to Available Baseline (11)		
Phase 1 (L) Tower/Bldg adjustment (M) Land Cost	26,189,272	28,446,141	1,415,823 (873,813)	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
Phase 1 Sub Total	26,189,272	28,446,141	542,010	(1,033,488)	476,207	2,669,686	859,792	24,440,456	24,281,971	158,485		
Phase 2	34,730,639	0										
Phase 3	47,671,945	0										
Phase 4	59,074,186	0										
Infrastructure	167,666,042	28,446,141	542,010									
Change Order Summary Finance Charge	3,061,382	675,747				538,470						
Subs - Total Project Finance Charge	16,548,490											16,548,490
Subscriber Fund Total												149,776
Orders to date		7,544,538									8,964,491	16,698,266
Proj Total	187,275,914	36,666,426	542,010	(1,033,488)	476,207	3,208,156	859,792	24,440,456	24,281,971	158,485	8,964,491	7,733,775

*CTC*  
*Q*

# VARIANCE SHEET

Descriptions			Base Line Variance			
	Old	New	SOM Scope Deletions	SOM Modifications	SOM Additions	Local Users
			D	E	F	G
1	11Y-MWR	1000				
2	40-MWR	1000				
3	20-MWR(D)	1000	(779,772)			
4	43Z	1001				
5	16T	1104		(32,817)		102,599
6		1108		209,137		
7	19	1202				17,717
8	14T	1402				
9	42H	1804				25,619
10	49	1902			9,827	8,912
11	25T	2502				24,900
12		2904		707,544		
13	30	3802				83,685
14		5802			13,691	
15	11T-MWR(D)	1106	(0)	(15,975)	157,976	
16	41X	1702				113,868
17	42	1802				25,727
18	23Z	2402			140,072	106,161
19	24X	2404			65,428	96,481
20	21T-MWR(D)	2504	(15,976)	(506,862)	18,368	32,152
21	29T	2902		41,530	11,645	
22		3402			153,973	
23	37	3702			50,519	
24	13B	6802			13,275	
25	14Z	1502				
26	27Z	2102			97,438	120,347
27	26Z	2602				28,403
28	28Z	2802				
29	39T	3902			119,968	
30	41Z	5702			29,054	
31	16I	1102		73,650	107,744	117,635
32	Fire Supression		(157,739)			
33	Report Integrator		(40,000)			
34	T1 Bulk Encryptors		(40,000)			
35	Customer Selected Options				1,680,708	
	Adjust LU to match Documentation					(44,413)
	Totals		(1,033,488)	476,207	2,669,686	859,792

*CTC*  
*JF*

# DATA SHEET

<b>Exhibit E Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	39,618,212	3,061,382	10,367,558	26,189,272
Phase 2	37,078,300		2,347,661	34,730,639
Phase 3	50,431,798		2,759,853	47,671,945
Phase 4	60,147,604		1,073,418	59,074,186
	<b>187,275,914</b>	<b>3,061,382</b>	<b>16,548,490</b>	<b>167,666,042</b>

<b>Exhibit K Breakdown</b>				
	Total	Fin Charge	Subscribers	Fixed Equip
Phase 1	36,616,853	626,129	7,544,583	28,446,141
Phase 2	-	-	-	-
Phase 3	-	-	-	-
Phase 4	-	-	-	-
	<b>36,616,853</b>	<b>626,129</b>	<b>7,544,583</b>	<b>28,446,141</b>

<b>Finance Charge</b>					
	Exhibit E	Pro-Rata	Contract	DDP	Over Baseline
Phase 1	3,061,382	647,635	689,909	626,129	(21,506)
Finance Adjusted per Contract				49,618	28,112
Phase 2	-	606,115	645,679		
Phase 3		824,404	878,216		
Phase 4		983,228	1,047,407		
	3,061,382		3,261,211	675,747	28,112
Transfer to Sub Fund			149,776		
			<u>3,111,435</u>		
		Equipment	Charge	Factor	
		184,214,532	3,261,211	1.770%	

*JTC*

# DATA SHEET

## Subscriber Reconciliation

Exhibit E				
	Equip	Spares	Install	Total
Phase 1	9,521,448	-	846,110	<b>10,367,558</b>
Phase 2	2,202,211	-	145,450	<b>2,347,661</b>
Phase 3	2,588,620	-	171,233	<b>2,759,853</b>
Phase 4	1,004,195	-	69,223	<b>1,073,418</b>
	15,316,474	-	1,232,016	<b>16,548,490</b>
Exhibit K				
Phase 1	6,606,347	239,404	698,832	<b>7,544,583</b>
Phase 2				-
Phase 3				-
Phase 4				-
	6,606,347	239,404	698,832	<b>7,544,583</b>

## Subscriber Orders

Desc	Origin	Equip	Install	Fin Chg	Total	Balance
						16,548,490
Phase 1 DDP List	P1DDP	7,346,152	742,001	0	8,088,153	8,460,337
Finance Charge Remaining Bal	(8,460,337)				-	149,776
Sub Total					-	<u>8,610,113</u>
MSP Order	CCN # 11	65,125	4,875	1,239	71,239	8,538,873
Spares	CCN # 11	393,604	27,105	7,448	428,157	8,110,717
DOC	CCN # 11	257,864	60,625	5,638	324,127	7,786,589
MA	CCN # 11	45,005	6,890	919	52,814	7,733,775
	CCN # 11				-	7,733,775
					-	7,733,775
					-	7,733,775
					-	7,733,775
					-	7,733,775
					-	7,733,775
					-	7,733,775
		8,107,751	841,496		8,964,491	7,733,775

*etc*  
*JK*

# DATA SHEET

## Tower Adjustments

Phase 1	Tower	Building	Total
1202	-	(31,160)	(31,160)
1402	(163,898)	(31,160)	(195,058)
1804	-	(30,780)	(30,780)
1902	(66,267)	(30,780)	(97,048)
2502	-	(31,683)	(31,683)
3802	-	(31,684)	(31,684)
5802	(247,850)	(24,953)	(272,803)
1106	-	(26,471)	(26,471)
1702	(217,992)	(19,368)	(237,360)
1802	-	(30,780)	(30,780)
2402	-	(21,635)	(21,635)
2404	(143,879)	(21,635)	(165,514)
2504	-	(25,395)	(25,395)
3402	-	(16,845)	(16,845)
3702	-	(8,619)	(8,619)
6802	-	(30,803)	(30,803)
1502	(37,064)	(21,202)	(58,266)
2102	-	(18,513)	(18,513)
2602	-	(22,200)	(22,200)
2802	-	(21,628)	(21,628)
3902	-	(20,621)	(20,621)
5702	-	(20,954)	(20,954)
Total P1	(876,951)	(538,872)	(1,415,823)
<b>Phase 2</b>			
Total P2	-	-	-
<b>Phase 3</b>			
Total P3	-	-	-
<b>Phase 4</b>			
Total P4	-	-	-
<b>Grand Total</b>	(876,951)	(538,872)	(1,415,823)

*CTC*  
*JH*

# DATA SHEET

## Change Order Summary

Description	Chg No	Amount
	1	0
	2	0
	3	0
	4	0
Fuel Tanks and Telco	5	172,280
Add'l Ambassador Bds	6	13,810
X terminals at Disp	7	105,717
Encrypted DIU's	7	6,237
Console Logging Upgrade	7	29,494
2102 Sunk Costs	7	102,770
	8	-
	9	-
2102 Site Survey	10	2nd Site Investigation Survey for 2102 - Gravel Pit
		16,464
2102 - Cost of Svcs performed	10	56,000
GPS Clock Source	10	Originally a Customer Responsibility
		32,740
1202 - Raven Order Wire	10	2,958
		-
		-
		-
		-
		-
Change Order Summary		538,470

## NOTES

### Notes:

- 1 Baseline pricing from Exhibit E - Less Subscribers and Finance Charges
- 2 Total Contract Commitments from Exhibit K - Less Subscribers and Finance Charges
- 3 Described in section 1 35 9 in Contract
- 4 Baseline Functional Modification (Net)
- 5 Sum of all State of Michigan Baseline Requirement Adjustments
- 6 Additional State of Michigan Requirements
- 7 Additional Local User Requirements
- 8 Dollars required for Motorola to meet adjusted baseline requirements adjusted for adds;  
[B-(E+F+G)]
- 9 Total dollars for Motorola to meet adjusted baseline requirements; (Exhibit E minus; Adjustments for towers and buildings; plus Deletions; plus Net of Tower/Bldg Adjustments and land cost) [A-L+D+(L+M)]
- 10 No adjustments made for increased tower loading required as a result of local users
- 11 Variance between "Adjusted Baseline" dollars (J) and "Motorola's required dollars" from Exhibit K (H). [H-J]
- 12 The baseline price if \$187,275,915 represents the State's purchase price for the baseline functionality of the system as specified in Exhibit A of the contract.  
Reductions in Baseline functionality result in corresponding reductions in the Baseline price.  
Additional items or modifications and optional features ordered by the State shall be in addition to the Baseline Price

# Subscriber Quantities Tracking Sheet

Exhibit "K"										MSP Order (02/20/97)	
DDP Revised (12/02/96)										MSP Order (02/20/97)	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	
Subscriber Feature License (Includes 5,0 36 (5,000 Units)											
K		3010	MOT	1,000,000	1	1,000,000					
K	Enhanced Smartnet Operation	3010	MOT		1						
K	Trunked ID Display	3010	MOT		1						
K	Multi-Zone	3010	MOT		1						
K	<b>Astro Spectra</b>										
K	800 MHz, 35 Watt, A3	494	MOT	2,172	402	873,144					
K	<b>Remote Mount</b>										
K	DES-XL Operation	494	MOT	679	402	272,958					
K	Enhanced Smartnet Operation	494	MOT	149	402	59,898					
K	Trunked ID Display	494	MOT	423	402	170,046					
K	10 Watt Audio	494	MOT		402						
K	Multi-Zone Operation	494	MOT	10	402	4,020					
K	<b>Astro Spectra</b>				0						
K	800 MHz, 35 Watt, A3	494	MOT	2,172	0						
K	<b>Remote Mount</b>										
K	Enhanced Smartnet Operation	494	MOT	679	0						
K	Trunked ID Display	494	MOT	149	0						
K	10 Watt Audio	494	MOT		0						
K	Multi-Zone Operation	494	MOT	10	0						
K	<b>Astro Spectra</b>										
K	800 MHz, 35 Watt, A5	494	MOT	2,172	198	430,056					
K	ASTRO Digital Operation	494	MOT	79	198	15,642					
K	Enhanced Smartnet Operation	412	MOT		198						
K	Trunked ID Display	494	MOT		198						
K	10 Watt Audio	494	MOT		198						
K	Multi-Zone Operation	494	MOT	10	198	1,980					
K	<b>Astro Spectra</b>				0						
K	800 MHz, 35 Watt, A5	494	MOT	2,172	221	480,012			25	54,300	
K	Remote Mount	494	MOT	79	221	17,459			25	1,975	
K	ASTRO Digital Operation	494	MOT	149	221	32,929			25	3,725	
K	Enhanced Smartnet Operation	412	MOT		221				25		
K		494	MOT		221				25		

*CTC*  
*QZ*

# Subscriber Quantities Tracking Sheet

Exhibit "K"										MSP Order (02/20/97)	
DDP Revised (12/02/96)										MSP Order (02/20/97)	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext	
K Trunked ID Display	G114	494	MOT						25		
K 10 Watt Audio	W432	494	MOT	10	221	2,210	221	2,210	25	250	
K Multi-Zone Operation	G358	494	MOT		221		221		25		
K <b>Astro Spectra</b>	2 T99DX	494	MOT	2,172	415	901,380	415	901,380			
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	415	32,785	415	32,785			
K <b>Remote Mount</b>	W496	495	MOT	149	415	61,835	415	61,835			
K <b>Siren/PA Module</b>	W269	494	MOT	359	415	148,985	415	148,985			
K ASTRO Digital Operation	G242	412	MOT		415		415				
K Enhanced Smartnet Operation	G51	494	MOT		415		415				
K Trunked ID Display	G114	494	MOT		415		415				
K 10 Watt Audio	W432	494	MOT	10	415	4,150	415	4,150			
K Multi-Zone Operation	G358	494	MOT		0		0				
K <b>Astro Spectra</b>	3 T99DX	494	MOT	2,172	7	15,204	7	15,204			
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	7	553	7	553			
K <b>Remote Mount</b>	W496	495	MOT	149	7	1,043	7	1,043			
K <b>DES-XL Operation</b>	W795	494	MOT	423	7	2,961	7	2,961			
K ASTRO Digital Operation	G242	412	MOT		7		7				
K Enhanced Smartnet Operation	G51	494	MOT		7		7				
K Trunked ID Display	G114	494	MOT		7		7				
K 10 Watt Audio	W432	494	MOT	10	7	70	7	70			
K Multi-Zone Operation	G358	494	MOT		7		7				
K <b>Astro Spectra</b>	6 T99DX	494	MOT	2,172	24	52,128	24	52,128			
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	24	8,208	24	8,208			
K <b>Remote Mount</b>	W496	495	MOT	149	24	3,576	24	3,576			
K <b>Siren/PA Module</b>	W269	494	MOT	359	0		0				
K ASTRO Digital Operation	G242	412	MOT		24		24				
K Enhanced Smartnet Operation	G51	494	MOT		24		24				
K Trunked ID Display	G114	494	MOT		24		24				
K 10 Watt Audio	W432	494	MOT	10	24	240	24	240			
K <b>Astro Spectra</b>	10 T99DX	494	MOT	2,172	5	10,860	5	10,860			
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	5	1,710	5	1,710			

*CTC*  
*[Signature]*

# Subscriber Quantities Tracking Sheet

Exhibit "K"										MSP Order (02/20/97)			
DDP Revised (12/02/96)										Qty		Ext	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext			
K Remote Mount	W496	495	MOT	149	5	745							
K Siren/PA Module	W269	494	MOT	359	0								
K DES-XL Operation	W795	494	MOT	423	5	2,115							
K ASTRO Digital Operation	G242	412	MOT		5								
K Enhanced Smartnet Operation	G51	494	MOT		5								
K Trunked ID Display	G114	494	MOT		5								
K 10 Watt Audio	W432	494	MOT	10	5	50							
K Astro Spectra (Control Station)	8 T99DX	494	MOT	2,172	13	28,236							
K DES-XL Operation	W795	494	MOT	423	13	5,499							
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	13	1,027							
K ASTRO Digital Operation	G242	412	MOT		13								
K Enhanced Smartnet Operation	G51	494	MOT		13								
K Trunked ID Display	G114	494	MOT		13								
K Control Station Operation	W665	494	MOT	305	13	3,965							
K Astro Spectra (Control Station)	9 T99DX	494	MOT	2,172	70	152,040							
K 800 MHz, 35 Watt, A5	131W	494	MOT	79	70	5,530							
K ASTRO Digital Operation	G242	412	MOT		70								
K Enhanced Smartnet Operation	G51	494	MOT		70								
K Trunked ID Display	G114	494	MOT		70								
K Control Station Operation	W665	494	MOT	305	70	21,350							
K Astro Spectra (Control Station)	11 T99DX	494	MOT	2,172	0								
K DES-XL Operation	W795	494	MOT	423	0								
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	0								
K ASTRO Digital Operation	G242	412	MOT		0								
K Enhanced Smartnet Operation	G51	494	MOT		0								
K Trunked ID Display	G114	494	MOT		0								
K Control Station Operation	W665	494	MOT	305	0								
K Astro Spectra (Control Station)	12 T99DX	494	MOT	2,172	0								
K 800 MHz, 35 Watt, A7	132W	494	MOT	342	0								
K ASTRO Digital Operation	G242	412	MOT		0								
K Enhanced Smartnet Operation	G51	494	MOT		0								

*CTG*

# Subscriber Quantities Tracking Sheet

Exhibit "K"										MSP Order (02/20/97)			
DDP Revised (12/02/96)										Qty		Ext	
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext			
K	Trunked ID Display	494	MOT	G114		0							
K	Control Station Operation	494	MOT	W665	305	0							
K	9 db Yagi Antenna	207	ADW	25 TDF6556A	167	13,727	82	13,727					
K	1/2" LDF Cable	207	ADW	L1705	1,5958	12,766	8,000	12,766					
K	N-male Connector	207	ADW	TDN6677A	20	3,214	160	3,214					
K	Lightning Arrestor	207	ADW	RRX4043A	36	2,879	80	2,879					
11	Jumper												
K	AC Surge Suppressor	262	ADW	RLN4264	67	5,327	80	5,327					
K	Grounding Kit	207	ADW	TDN6673A	15	1,161	80	1,161					
K	<b>ASTRO Digital SPECTRA Motorcycle R 7</b>	494	MOT	M99DX	2,897	55,043	19	55,043					
K	W5 Rocker Select Control Head 15 Watts	412	MOT	W177	185	3,515	19	3,515					
K	ASTRO Digital Operation	494	MOT	G242			19						
K	SmartZone Operation	494	MOT	G51			19						
K	ENH: ID Display	494	MOT	G114			19						
K	<b>ASTRO Digital SABER Radio</b>	310	MOT	H99DX	1,856	889,024	479	889,024					
K	800 MHz, 3 Watt, Model II	310	MOT	212H	295	141,305	479	141,305					
K	Enhanced Smartnet Operation	310	MOT	H38			479						
K	Trunked ID Display	310	MOT	H14			479						
K	Detachable Belt Clip	310	MOT	H301			479						
K	Multi-Zone Operation	310	MOT	G358			479						
K	Digital and Analog Operation	310	MOT	Q242			479						
K	<b>ASTRO Digital SABER Radio</b>	310	MOT	H99DX	1,856	729,408	393	729,408					
K	800 MHz, 3 Watt, Model II	310	MOT	212H	295	115,935	393	115,935					
K	<b>DES-XL Operation</b>	310	MOT	W795	423	166,239	393	166,239					
K	Enhanced Smartnet Operation	310	MOT	H38			393						
K	Trunked ID Display	310	MOT	H14			393						
K	Detachable Belt Clip	310	MOT	H301			393						
K	Multi-Zone Operation	310	MOT	G358			393						
K	Digital and Analog Operation	310	MOT	Q242			393						
K	Remote Speaker Mic	310	MOT	NMN6234	126		0						
K	Single Unit Rapid Charger	310	MOT	NTN4734	195		0						

# Subscriber Quantities Tracking Sheet

Exhibit "K"						DDP Revised (12/02/96)		MSP Order (02/20/97)	
	Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext
K	ASTRO Digital SABER Radio	22	H99DX		1,856	31	57,536		
K	800 MHz, 3 Watt, Model III		214H		679	31	21,049		
K	Enhanced Smartnet Operation		H38			31			
K	Trunked ID Display		H14			31			
K	Detachable Belt Clip		H301			31			
K	Multi-Zone Operation		G358			31			
K	Digital and Analog Operation		Q242			31			
K	Remote Speaker Mic		NMN6234	MOT	126	0			
K	Single Unit Rapid Charger		NTN4734	MOT	195	0		25	4,875
K	ASTRO Digital SABER Radio	23	H99DX		1,856	13	24,128		
K	800 MHz, 3 Watt, Model III		214H		679	13	8,827		
K	DES-XL Operation		W795		423	13	5,499		
K	Enhanced Smartnet Operation		H38			13			
K	Trunked ID Display		H14			13			
K	Detachable Belt Clip		H301			13			
K	Multi-Zone Operation		G358			13			
K	Digital and Analog Operation		Q242			13			
K	Remote Speaker Mic		NMN6234	MOT	126	0			
K	Single Unit Rapid Charger		NTN4734	MOT	195	0			
K	Remote Speaker Mic (SABER)	32	NMN6234 ??	(612) MOT	126	893	112,518		
9	Antenna for Speaker Mic	32	NAF5002	MOT	15				
K	Six Unit Multi-charger (SABER)	34	NTN4796	MOT	788	74	58,312		
K	Single Unit Rapid Charger (SABER)	33	NTN4734	MOT	195	477	93,015		
11	Astro Vehicle Adapter	35	NTN1143	465	545				
11	Antenna - 800 MHz low loss line	35	RRA4983	555	35				
11	UHF Connector	35	5880367B22		8				
11	Medium Capacity	35	NTN4593	256	105				
K	Keyloader - DES-XL	28	T3011_X	MOT	1,115	2	2,230		
K	DIU Interface Cable		C542	MOT	30	2	59		

*CJC*  
*AN*

# Subscriber Quantities Tracking Sheet

Exhibit "K"										MSP Order (02/20/97)						
DDP Revised (12/02/96)										Qty		Ext				
Description	onfig Model No	APC	Manuf	Unit	Qty	Ext	Qty	Ext	Qty	Ext						
K Spectra Interface Cable	C954	424	MOT	44	2	89										
K Saber Interface Cable	C544	424	MOT	30	2	59										
K Vehicular Repeater	P2019	387	MOT	1,973	0											
K Antenna	TAD6113	555	MOT	11	0											
K Siren Interface Cable	G334	555	MOT		0											
K Vehicular Repeater	P2019	387	MOT	1,973	0											
K Antenna	TAD6113	555	MOT	11	0											
K VISAR High Band Portable	24 H05KDD9AA4_N	720	MOT	1,118	0											
K ADD: 150.8 - 162 MHz Helical Antenna	H129	720	MOT		0											
K ALT: Plastic Carry Holder with 2.5" belt clip	H306	720	MOT		0											
K VISAR High Band Portable	H05KDD9AA4_N	720	MOT	1,118	0											
K ADD: 150.8 - 162 MHz Helical Antenna	H129	720	MOT		0											
K ALT: Plastic Carry Holder with 2.5" belt clip	H306	720	MOT		0											
K DEL: charger & power cord	H951	721	MOT	(143)	0											
K Dual Unit Rapid Charger (VISAR)	NTN1308	720	MOT	143	0											
K Charger Line Cord (VISAR)	NTN7373	720	MOT	6	0											
K 120 Volt Rapid Charger (VISAR)	NTN7621	720	MOT	641	0											
K VISAR Speaker / Mic	NMN6169	720	MOT	80	0											
K Mobile Repeater	BXR2202	229	AIS	4,464												
K Body Worn Transmitter	TX922	229	AIS	1,562												
K Surveillance Unit	TX788	229	AIS	2,176												
K Delete Standard 800 MHz mobile antenna and installation				(14)	531	(7,471)										
K Replace Standard 800 MHz mobile antenna				26	160	4,160										
SUBSCRIBER TOTAL																
																7,346,152
																65,125

*CTC*  
*RF*











# Subscriber Quantities Tracking Sheet

MSP Spare Equip (03/17/97)		Department of Corrections (03/24/97)		Department of Military Affairs (03/21/97)		Next Order		Next Order	
Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext	Qty	Ext
15	27,840	0							
15	10,185	0						46	85,376
15								46	31,234
15								46	
15								46	
15								46	
15								46	
15								46	
33	4,158							25	4,875
33	495							13	24,128
33	6,435							13	8,827
								13	5,499
								13	
								13	
								13	
								13	
								13	
								13	
								961	121,086
								68	1,020
								80	63,040
								524	102,180
								35	19,070
								35	1,229
								35	285
								35	3,689
								2	2,230
								2	59

  
 Page 19 of 21  
 June 20, 1997  
 3:02 PM

# Subscriber Quantities Tracking Sheet

MSP Spare Equip (03/17/97)	Department of Corrections (03/24/97)	Department of Military Affairs (03/21/97)	Next Order	Next Order	Next Order
Qty	Qty	Qty	Qty	Qty	Qty
Ext	Ext	Ext	Ext	Ext	Ext
0	0	0			2
0	0				2
0					89
0					59
393,604	257,864	45,005			531 (7,471)
					160 4,160
					8,107,753

