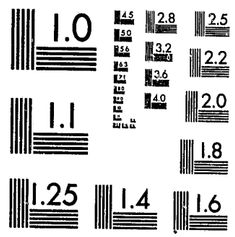

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EMERGENCY COMMAND CONTROL COMMUNICATIONS SYSTEM (ECCCS)

SYSTEM OPERATIONS AND PERFORMANCE REQUIREMENTS

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EMERGENCY COMMAND CONTROL COMMUNICATIONS SYSTEM (ECCCS)

SYSTEM OPERATIONS AND PERFORMANCE REQUIREMENTS

Prepared for

The Los Angeles Police Department
Los Angeles, California

By

The Jet Propulsion Laboratory
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This specification presents the results of one phase of research carried out at the Jet Propulsion Laboratory, California Institute of Technology, under Contract NAS7-100, sponsored by the National Aeronautics and Space Administration.

GLOSSARY

ACC	Area Command Center
ALI	Automatic Location Identification
ANI	Automatic Number Identification
AVM	Automatic Vehicle Monitoring
BAN	Base Alphanumeric
BFT	Base Fixed Text
CAD	Computer Aided Dispatch
CCC	Communications and Command Center
CCTV	Closed Circuit Television
CDC	Central Dispatch Center
CHE	City Hall East
CHP	California Highway Patrol
CIC	Casualty Information Center
CLEMARS	California Law Enforcement Mutual Aid Radio System
CLETS	California Law Enforcement Telecommunications System
DBI	Data Base Inquiry
DBR	Data Base Response
DFAR	Daily Field Activity Report
DISP	Dispatch
DWP	Department of Water and Power
ECC	Emergency Control Center
ECCCS	Emergency Command Control Communications System
EOC	Emergency Operations Center
FCP	Field Command Post
FD	Fire Department
ICC	Intelligence Control Center
KSR	Keyboard Send Receive
LASO	Los Angeles Sheriff's Office
LAFD	Los Angeles Fire Department
MAN	Mobile Alphanumeric
MCC	Mobile Command Center
MCS	Microwave Communications System
MDT	Mobile Digital Terminal

GLOSSARY (CONT'D)

MFT	Mobile Fixed Text
NCIC	National Crime Information Center
PSAP	Public Safety Answering Point
RD	Reporting District
SVS	Stolen Vehicle System
U. O.	Unusual Occurrence
WPS	Wanted Persons System

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SECTION I

INTRODUCTION

A. GENERAL

The Los Angeles Police Department's (LAPD) Emergency Command Control Communications Systems (ECCCS) is being implemented to provide the citizens of Los Angeles with a modern and effective law enforcement capability. The ECCCS system shall provide the LAPD with the operational tools required for the deterrence and control of crime through the timely and efficient response to emergencies and citizen's calls for service.

B. PURPOSE AND SCOPE

This document (ECCCS-1) establishes the operational and performance functional requirements for the ECCCS system and, together with other ECCCS series documents, establishes the detailed ECCCS system and subsystem requirements. Detailed ECCCS system and subsystem specifications shall conform to these basic requirements.

C. IMPLEMENTATION PRIORITIES

The operational and performance requirements specified in Section III of this document are preceded by an implementation priority in parentheses. The ECCCS implementation priorities listed below represent the various levels of operational capabilities that the system will provide to the LAPD operating personnel and to the citizens of Los Angeles:

- Mandatory Priority (1)
- Highly Desirable Priority (2)
- Desirable Priority (3)

D. DOCUMENT CONTROL

This document and other ECCCS series documents are under configuration control. Request for revisions and changes to ECCCS series documents shall be addressed in writing to the LAPD ECCCS Program Management Office.

E. APPLICABLE DOCUMENTS

1) Data Service Bureau Policies, Procedures and Standards, 1970
2) Federal Specification FF300 Air Filtration
3) "Human Engineering Guide for Equipment Designers", Second Edition, by Woodson, W. E., and Conover, D. W., Berkeley, University of California Press, 1964.
4) "Human Engineering Design Criteria for Military Systems, Equipment and Facilities," MIL-STD-1472 A, 15 May 1970.
5) "Statistical Analysis of Radio Communications Requirements for the Los Angeles Emergency Command Control Communications System (ECCCS)", JPL R-75-D02, 24 January 1975.
6) Electronic Industries Association Standards

   a. Digital Communications, RS-232-C
   b. Mobile Environmental Equipment, RS-152-A

SECTION II

FUNCTIONAL REQUIREMENTS

A. GENERAL

This section presents the ECCCS system objectives, functional requirements, and system design guidelines that shall be observed in the design and implementation of the ECCCS system and subsystems.

B. OPERATIONAL CONCEPT

The ECCCS system, through a centralized command and control system, shall facilitate command of LAPD forces under both normal and unusual occurrence conditions within the City of Los Angeles.

The ECCCS Communications and Command Center (CCC) shall serve as the communications terminal point interfacing the LAPD CCC with field personnel, Area Command Centers (ACC), Mobile Command Centers (MCC), the citizens of Los Angeles, and the various City, County, State, and Federal law enforcement and emergency service agencies.

The CCC facility shall be located at the fourth and fifth sublevels of City Hall East (CHE) and shall contain the Central Dispatch Center (CDC), the Emergency Control Center (ECC), and the necessary equipment and support facilities required to maintain operations during normal and emergency conditions. The CCC shall interface with the City Emergency Operations Center (EOC).

The CDC shall provide an automated system that receives calls for service from all sources, including private alarm and emergency telephone systems. The CDC shall process service requests and issue dispatch orders to field personnel through voice and digital communications systems. The CDC shall also communicate with the MCC and ACCs to provide information regarding status and deployment of resources.

The ACC shall coordinate with the CDC in the daily supervision and scheduling of assigned personnel and equipment. The ACC shall also monitor CDC and MCC operations and provide backup control and management of its respective area.

When activated, the ECC shall provide the capability for monitoring real-time operations and for coordinating resources availability during major or serious unusual occurrences.

When activated, the MCC shall provide the on-site command and control of LAPD resources assigned to control the area affected by an unusual occurrence.

C. SYSTEM OBJECTIVES

The ECCCS system shall provide the LAPD with the capabilities for improved operations and service in the changing environment of the City of Los Angeles through 1990.

1. Basic Objectives of the ECCCS.

a) Improve response time to a citizen's call for service.
b) Improve personal safety of field personnel.
c) Improve the communications network to meet load demands through 1990.
d) Improve the coordination and management of resources during normal and unusual conditions.
e) Provide automated processes to minimize operating cost, personnel staffing, and skill levels necessary for LAPD operations.
f) Provide the City of Los Angeles with a "911" Public Safety Answering Point in accordance with State Law AB 515.
g) Provide limited communications security for LAPD operations.
h) Improve LAPD management data availability.

i) Improve LAPD communication between the City, neighboring cities, County, State, and Federal law enforcement and emergency service agencies.

2. ECCCS Response Time

a) During the average busy hour, excluding U. O.'s, and when processing routine service requests and dispatches, the response time of the CDC operators, equipment, and radio channels shall be less than those given below. In addition to these system response-time requirements, there are a large number of smaller process-response times which contribute to overall system delays. The sum of these response times cannot exceed the limits of the time-response parameters given below. These response-time requirements are not defined herein.

1) 10 seconds maximum (from first ring) to reply to telephone service requests.
2) 20 seconds (95% of the time) to enter all incident data and be ready to issue a dispatch order. This time is exclusive of the length of the telephone call.
3) 5 seconds (95% of the messages) between initiation of a voice or digital message and receipt of that message, exclusive of the message length itself.
4) 5 seconds (95% of the time) to issue a dispatch order or to queue the order for future dispatch.
5) 5 seconds (95% of the messages) between the time of patrol officer's Mobile Digital Terminal (MDT) transmission of a data base inquiry and the time the first response is returned to him. This time is exclusive of the response time of systems external to ECCCS and of human operator data review prior to response to the field officer.

6) 5 seconds (95% of the queries) between initiation of a single vehicle location query and the display of the location information.

D. CENTRAL DISPATCH CENTER FUNCTIONAL REQUIREMENTS

The ECCCS CDC and its equipment and operating personnel shall be located at the fourth and fifth sublevels of City Hall East (CHE). The CDC shall include capabilities for meeting the following requirements:

1. Service Request Handling Requirements

a) Operate for the City of Los Angeles the "911" Emergency Telephone System, Provide for the processing of LAPD calls and for the transferring, relaying, or referring of calls requiring action by other emergency service agencies.
b) Provide reception and acknowledgement of all requests for services received from citizens, LAPD personnel, private security systems, Los Angeles City agencies, neighboring city, County, State, and Federal law enforcement and emergency service agencies.
c) Provide incident location verification and jurisdiction, determine nature of incident, and obtain a summary of available intelligence regarding the incident and its location.

2. Dispatch Requirements

a) Identify and dispatch to the scene of an incident the most appropriate field unit within Team Policing parameters.
b) Ascertain availability of other field units for backup support of all dispatch incidents.
c) Provide appropriate field units with pertinent information regarding the incident.

d) Provide field-unit dispatching and information exchange capability via LAPD radionetworks or Gamewell and commercial telephone systems.

3. Field Support Requirements

a) Maintain and provide access for ACCs, field supervision, and higher ranking personnel to current shift information regarding field-unit deployment, unit locations, status, assignments, and statistical data.
b) Provide field-unit access to City, County, State, and Federal police information data files.
c) Monitor requests from the field regarding "officer needs help", "back-up", "assistance", or other requests, including special emergency messages generated by an emergency trigger device.
d) Provide a controlled means for assigning, transferring, or assuming dispatch control of a field unit to and from an Area Headquarters and MCC.

4. General Requirements

a) Provide centralized and coordinated dispatch of LAPD field operating units. Dispatch operations shall be maintained continuously 24 hours per day, 7 days per week.
b) Provide computer-aided techniques capable of real-time processing of service requests requiring LAPD response.
c) Provide information exchange via telephone, radio, closed-circuit television, and digital communications between the CDC and all other LAPD operating centers and field units.
d) Provide access to City, County, State, and Federal police information data files at each operating position.
e) Provide selective monitoring of radio communications of non-LAPD agencies.

f) Provide voice and digital logging of all communications and services provided at the CDC.

g) The CDC shall be designed to continue functioning in degraded modes following equipment failures.

E. AREA COMMAND CENTER FUNCTIONAL REQUIREMENTS

The Area Command Center (ACC), located in each Area Headquarters, shall provide the following capabilities in support of ECCCS operations:

1. Normal Operational Requirements

a) Provide information to the CDC on daily deployment assignments and equipment availability for normal and unusual occurrences (U. O.) deployment (LAPD Form 14. 3).

b) Monitor Area personnel and equipment assignments, status, and locations.

c) Provide access to current watch activity files for reports, including Daily Field Activity Reports (DFAR), and other information for management.

d) Provide relaying or transferring of calls and responses to "walk-in" requests for service requiring LAPD field-unit dispatch to the CDC.

e) Provide for the relaying, transferring, referral, or action on calls and "walk-in" requests for service not requiring LAPD field-unit dispatch.

f) Maintain the monitoring capability to detect failures rendering the CDC or MCC ineffective or incapable of sustaining Area control.

2. Backup Operational Requirements

a) Assume Area operations responsibilities as directed by the CDC, MCC, or upon detection of failures rendering the

above Operations Centers ineffective or incapable of sustaining area control.

b) Operate telephone emergency answering backup service.

c) Dispatch Area field personnel.

d) Monitor field personnel status and location.

e) Coordinate operations activities with other ACCs and Area service agencies

f) Provide for the selective monitoring of radio communications of non-LAPD agencies.

3. General Requirements

a) Maintain capability for operating, as necessary, up to 24 hours per day, 7 days per week.

b) Provide communications with ACC field personnel, the CDC, ECC, MCC, and adjacent Area Headquarters. Communications capabilities shall include commercial telephone, City private lines, closed-circuit TV, and digital/radio networks.

c) Maintain a continuous log of voice and digital transactions processed at the ACC during ACC backup modes of operation.

d) Provide the capability of limited real-time playback of voice traffic at each ACC operating position.

e) The ACC shall be designed to function in degraded modes following equipment failures.

F. FIELD UNIT EQUIPMENT FUNCTIONAL REQUIREMENTS

Mobile and foot-patrol units and fixed sites shall be provided with equipment having capabilities for meeting the following requirements:

1. Mobile Vehicle Communications Requirements

   a) Provide via mobile digital terminals (MDT) the capability of transmission and display of field-unit status, assignments, and free-text message exchange between MDT users, CDC, ECC, MCC, and ACCs.
   b) Provide access and display (via MDTs) to limited police information from City, County, State, and Federal files.
   c) Provide voice communications with other LAPD mobiles, other LAPD portable radio sets and with the CDC, ECC, MCC, and ACCs.
   d) Operate vehicle's location equipment to support the automatic determination of vehicle location and the radio equipment necessary to transmit associated data to the CDC, ECC, ACC and MCC.

2. Personal Communications Requirements

   a) Provide communications between LAPD portable radio set users, LAPD mobile units, CDC, ECC, MCC, and ACCs.
   b) Transmit via personal emergency trigger signaling devices a unique identification to the CDC, MCC, and ACCs. This function may be part of the portable radio.

3. Fixed-Site Communications Requirements

   a) Maintain, when required, continuous operation of remote communications and monitor sites 24 hours per day, 7 days per week.
   b) Provide an administrative communications network capable of interconnecting the CDC, ECC, MCC, ACC, and manned remote communications sites.
   c) Provide a mobile radio communications network capable of interconnecting all designated LAPD mobile units with

CDC, ECC, MCC, ACC, LAPD personal portables and other LAPD mobile units.

   d) Provide a personal portable radio communications network capable of interconnecting all designated LAPD portable radio sets with the CDC, ECC, MCC, ACC, and mobile radio units.
   e) Provide an emergency trigger communications network capable of receiving and processing digital identification codes as transmitted from personal emergency trigger devices.
   f) Provide emergency radio monitoring capability that will interface Los Angeles City, neighboring City, County, State, and Federal law enforcement and emergency service agencies communications networks with LAPD communications networks.
   g) Provide a digital communications network capable of interconnecting the CCC, MCC, ACC, and remote communications and monitor sites.

G. EMERGENCY CONTROL CENTER FUNCTIONAL REQUIREMENTS

The Emergency Control Center (ECC) shall be located adjacent to the CDC at the CHE facilities. When activated, the ECC shall include capabilities for meeting the following requirements:

1. Coordination and Reporting Requirements

   a) Coordinate the Department's unusual occurrence activities.
   b) Collect, evaluate, and disseminate information from the field command post, Department sources, and outside agencies.
   c) Provide personnel, equipment, and supplies to the unusual occurrences task force, as required.

d) Maintain chronological logs, situation maps, and intelligence and situation reports.
e) Request assistance and coordinate such assistance from other agencies, as necessary.
f) Compile periodic situation reports regarding the unusual occurrence(s), and prepare the ECC Final Report.
g) Monitor real-time status of all forces deployed under CDC, MCC, and ACC control.

2. General Requirements.

a) When activated, operate continuously (as necessary) up to 24 hours per day, 7 days per week.
b) Support LAPD response to multiple simultaneous unusual occurrences affecting the City of Los Angeles.
c) Interface selected City and outside communications networks with those of LAPD such that information exchange is possible.
d) Provide communications with the CDC, MCC, ACC, and field-unit personnel assigned to the unusual occurrence.
e) Monitor CCTV and commercial TV deployed at the scene of the unusual occurrence.
f) Provide a conference room facility for briefing, debriefing, and planning. The conference room shall include displays and maps identifying the scene and indicating the disposition of deployed forces and their status.
g) Maintain a continuous log of voice and digital transactions processed at the ECC.
h) Provide the capability of limited real-time playback of voice traffic at designated ECC operating position.
i) Provide contingency plans and procedures for degraded modes of operation. The ECC shall be designed to continue functioning in degraded modes following equipment failure.

H. MOBILE COMMAND CENTER FUNCTIONAL REQUIREMENTS

When activated, each Mobile Command Center (MCC), independently or in conjunction with the ECC, shall include capabilities to meet the following requirements:

1. Control and Coordination Requirements

a) **Assume local operations responsibility in the coordination and tactical control of LAPD-assigned resources and coordination of participating outside agencies in the involved area.**
b) **Maintain a real-time record for the involved area of deployment; equipment and personnel status with their capabilities and their current assignments; and provisioning and resupply status,**
c) **Provide situation, intelligence, and logistics reports to the ECC.**
d) **Provide Closed-Circuit Television (CCTV) monitoring of the local scene to the ECC.**

2. General Requirements

a) **Operate continuously (as necessary) up to 24 hours per day, 7 days per week, at the scene of an incident.**
b) **Maintain voice and digital communications with assigned field forces through mobile and personal portable radios.**
c) **Maintain communications with the ECC and affected ACC, via telephone, City private lines, microwave, and digital/voice radio networks.**
d) **Provide direct communication to the Fire Department and other appropriate City, County, State, and Federal support agencies.**
e) **Interface outside agencies' communication networks with those of LAPD such that information exchange is possible.**

f) Monitor assigned personnel's emergency trigger signalling devices.

g) Provide access to City, County, State, and Federal police information files.

h) Maintain a continuous log of voice, CCTV, and digital transactions processed at the MCC.

i) Provide the capability for limited real-time playback of CCTV and voice traffic at selected MCC operating positions.

j) The MCC shall be designed to continue functioning in degraded modes following equipment failure.

SECTION III

PERFORMANCE REQUIREMENTS

A. GENERAL

This section provides the ECCCS system performance requirements for operations, processes, and equipments that shall be designed and implemented in compliance with system objectives and functional requirements.

Performance requirements are preceded by an implementation priority number in parentheses (1), (2), or (3). See Section I, paragraph C, for priority definition.

B. CENTRAL DISPATCH CENTER PERFORMANCE REQUIREMENTS

Capabilities for the following operations, processes, and equipment performance characteristics shall be provided in the design and implementation of the Central Dispatch Center (CDC).

1. Service Request Response Requirements

The CDC operators shall process requests for service. Automatic data processing equipment shall be used to assist operators in the handling of requests for service. CDC performance shall meet the following requirements:

a) (1) Answer all calls, occuring during the average busy hour of each shift of the busy day, within 10 seconds.

b) (2) When all operator positions are busy, provide a recorded message asking the caller to wait or informing him that a major emergency incident has already been reported.

c) (1) Monitor calls in waiting queue, and flash appropriate warning signal at selected CDC positions.

d) (1) Initiate conference calls with selected foreign language translators as required to process service request.

e) (1) Process telephone-company-supplied calling party number and location identification information to the CDC operator handling the call.

f) (1) Log caller's name, address, and "call back" telephone number.

g) (1) Verify that the reported incident is within the City of Los Angeles.

h) (1) For service requests not requiring LAPD action, transfer or relay the request as appropriate, or provide referral information to the caller.

i) (1) Monitor transferred calls for successful transfer.

j) (1) Assign a priority to service requests requiring LAPD action, and process them for dispatch.

k) (1) Serialize, date, and time-tag service request transactions to the nearest second.

l) (1) Log nature, scope, and location of incident. Identify the reporting district and Team Area.

m) (1) Initiate, as deemed necessary by operator, a police information file check at the City, County, State, and Federal levels on the caller and known incident set of particulars.

n) (1) Initiate requests for service to other emergency and service agencies as required to support LAPD at the scene.

o) (1) Evaluate and process information arriving over LAPD FAST teletype network.

p) (1) Evaluate and process field-unit-initiated service requests arriving over telephone and LAPD radio networks.

2. Dispatch Requirements

CDC operators shall dispatch LAPD forces in response to requests for service. Automatic data processing equipment shall be used to assist operators in handling dispatch orders. The following functions shall be performed:

a) (1) Identify the police team units assigned to the Reporting District (RD) in which the reported incident is located and other units in the vicinity.

b) (2) Check new service requests against active and recent dispatch orders on the same incident. Display apparently related incidents to CDC operator for possible revision of dispatch orders.

c) (1) Evaluate service requests and establish dispatch order priority based upon type of incident.

d) (1) Refer unusual service requests to supervisory personnel for dispatch recommendations.

e) (1) Notify dispatch supervisory personnel of lack of field units available to accept dispatch orders in a given area.

f) (2) Identify, for complaining party "call-back" action, dispatch delays in each of the priorities of calls.

g) (2) Notify dispatch supervisory personnel of any discrepancies in information on field units' status or location.

h) (1) Select field units, and issue dispatch orders via radio or as prearranged via telephone.

i) (1) Transmit and time-tag to the nearest second appropriate dispatch information to the designated field units, their field supervisors, and their ACC.

j) (1) Process and time-tag, to the nearest second, field-unit acknowledgements of receipt of dispatch orders.

k) (1) Monitor and notify field supervisors and ACC of team crossover dispatch assignments.

l) (1) Process and time-tag, to the nearest second, field-unit incident arrival and incident clear report.

m) (1) Queue and display up to 10 calls assigned to a single field unit to allow assignment of more than one call for service to any one unit.

n) (1) Reassign a call to another unit at the option of the operator.

o) (1) Generate a historical log showing the disposition of each incident entered into the system.

3. CDC Requirements in Support of Field Units

The support and monitoring of field units shall be assisted through the use of automatic data processing as follows:

a) (1) Maintain a current status log of all field units which had been logged into the system. Data entry by radio or by CDC operator shall be possible.

b) (1) Provide upon request from field units a response to checks against police information files on persons, vehicles, or property. Police information files shall be at the City, County, State, and Federal levels.

c) (1) Monitor results of file check requested by field unit and immediately automatically notify requesting unit of any "hits."

d) (1) When certain designated "hits," such as Code 6C, occur, notify CDC, ACC, specified supervisory personnel, and (as appropriate) other field units.

e) (1) Summarize "hits" and warrant abstracts, and transmit information to designated locations and units.

f) (1) Process warrant abstracts and transmit to designated locations.

g) (1) Transfer to supervisory personnel for assistance and disposition any "Officer Needs Help" or "Back-up" and certain other designated emergency requests from the field. The field supervisor, all units in the vicinity, and the appropriate ACC shall be immediately notified of the emergency and its location.

h) (1) Monitor field units' status for overdue conditions exceeding a predetermined time limit. This time shall be capable of being set in increments of 10 minutes up to 60 minutes.

i) (1) Process and provide a report (upon demand) to field supervision, staff, and command personnel regarding specified units' current status, location, and assignment. Reports shall be issued on a selected unit, patrol team, Area, or

Bureau basis. Reports shall be transmitted within 15 seconds of request.

j) (1) Monitor for transmissions from field units' personal emergency trigger signaling devices and, upon detection of such a signal, notify the appropriate field supervisors, ACC, and other units.

k) (3) Provide information to field units, known significant road hazards, and traffic congestion that may be expected in their transit to the scene of an incident.

l) (1) Print all National Crime Information Center "hits" at the CDC.

m) Provide the following data-handling and processing capabilities for real-time MDT operations.

1) (1) Provide MDT's unique address code assignments for up to 2000 actively deployed MDT-equipped field units.

2) (1) Process and correlate MDT's assigned address code sequence with the following:

(a) Unit identification code (ID).
(b) Assigned officer's ID.
(c) Officer's field supervisor's ID.
(d) Officer(s) name.
(e) Frequency assigned.
(f) ECCCS Operations Center ID (CDC, MCC, ACC).
(g) Vehicle shop number.

3) (1) Accept, process, route, and retransmit MDT messages in accordance with pre-established message destination routing codes to allow for the following transactions:

(a) MDT to all points general broadcast (all operations centers and MDTs).
(b) MDT to selected MDT.
(c) MDT to preselected set of MDTs.
(d) MDT to selected operation centers.

4) (1) Accept, process, and transmit MDT messages from operations centers as predetermined by message routing codes to allow for the following transactions:

(a) Operations center to all MDTs general broadcast messages.
(b) Operations center to unique MDT.
(c) Operations center to unique set of MDTs.

5) (1) Process on demand, for field supervisors and higher ranks, transactions defined in Section III, paragraph D. 2.

6) (1) Accept and process MDT request for checks of police information files at the City, County, State, and Federal levels. MDT's request for this type of check shall include the data processing capabilities for the following:

(a) Verify MDT's identification code as an eligible code for access to such files.
(b) Format for appropriate data file inquiry.
(c) Summarize inquiry response and determine if there is a "hit."
(d) In event of a "hit," immediately notify requester, CDC, MCC, and ACC, as applicable.
(e) Transmit all no "hit" inquiries to requester. No "hit" responses may be summarized into one

message for all such responses which arrived within 15 seconds of inquiry.
(f) Include in all file checks certain initial request information set of particulars for field officer's confirmation of inquiry/response.

7) (1) Process and transmit for hard-copy printout at selected MDTs the following messages:

(a) All Code 6 Charles and selected "hit" inquiry responses.
(b) Selected field units' status reports.
(c) Selected field units' MDT dispatch order transactions.
(d) Preselected transaction while out of car.

8) (1) Provide for all MDT transaction message error detection. Issue a retransmit request or "transaction-accepted" acknowledgement to appropriate MDT.

9) (1) Provide for the detection of officer out-of-car status; save and queue new messages, and transmit a signal to set the MDT's "message back-log" display light. Issue all outstanding messages upon request by MDT user. MDT messages in queue greater than the out-of-car time limit or greater than 5 messages shall be reported to issuing operations center supervisory personnel for appropriate action.

10) (1) Provide for the magnetic-tape logging and time-tagging of all MDT transactions.

11) (1) Provide for selected MDT test and evaluation capabilities.

n) (1) Monitor and process officer-initiated assistance requests from field units.

o) (2) Maintain a location log of the last reported location of all field units which had been logged into the system. Data entry by radio or by CDC operator shall be possible. Detailed Automatic Vehicle Monitoring (AVM) specifications are given in Section III. D, paragraph 4. In addition, provide data processing with relative priority as follows:

1) (2) Maintain a real-time field-unit address code assignment for up to 2000 active deployed mobile units at any given time.

2) (2) Process and correlate address codes of field units with the following:

(a) Unit identification code (ID).
(b) Assigned officer's and field supervisor's ID.
(c) Assigned ACC ID.
(d) Current command center ID.

3) Maintain a data file with a set of coordinates to allow units' location identification within L. A. City area to:

(a) (2) Within 500 ft.
(b) (3) Within 300 ft.
(c) (3) Within 100 ft.

4) Process and provide, as required, field unit's location to CCC, the MCC, and the ACC as follows:

(a) (2) Location of street name and block number.
(b) (2) Location of reporting district.
(c) (2) Location of nearest major street intersection names.
(d) (2) Unit identification code.
(e) (2) Unit direction of travel.
(f) (3) Unit odometer reading.

5) Process and provide to the CCC, the MCC, and the ACC the following information:

(a) (2) Location of a selected field unit as defined above.
(b) (2) Location of a selected set of field units.
(c) (3) Location of a selected unit and all units in the vicinity within 10 square miles.
(d) (2) Location of all field units within a selected RD.
(e) (3) Dynamic track of location positions of a selected field unit or set of units. Dynamic graphics presentation shall include units' direction and rate of motion as computed within the AVM resolutions.
(f) (3) Track of selected field unit or set of units in hot pursuit. The units' location changes shall be logged and time-tagged by indicating direction, streets being travelled, and major intersections crossed.
(g) (3) Selected field unit's most probable location, processed on demand in event of that unit's AVM equipment failure.
(h) (2) Provide capability for manual entry of known vehicle location.
(i) (3) Selected field unit's location and mileage readings, processed on demand as required for transportation of female subjects.
(j) (2) Field unit's location, processed each time the field unit transmits via their MDT (except automatic acknowledgement).
(k) (2) Location verification message, as requested by a field officer via his MDT.

4. CDC Requirements in Support of ACC, ECC, MCC, and EOC

LAPD operations center's support shall be assisted by the use of automatic data processing equipment.

a. CDC Requirements in Support of ACC

The CDC shall meet the following ACC support requirements:

1) (1) Accept ACC's daily personnel and equipment deployment schedules for normal and U. O. conditions as received via teletype or voice communications.
2) (2) Accept ACC's daily personnel and equipment deployment schedules as received via automated means.
3) (2) Accept ACC's daily U. O. personnel and equipment schedule (LAPD Form 14. 3) as received via automated means.
4) (1) Provide each ACC its current field unit status, location (Priority 3), and assignments. Reports shall be issued on request, by ACCs.
5) (1) Provide each ACC with immediate reports of emergencies affecting its Area and assigned field personnel.
6) (1) Provide each ACC with immediate reports of selected types of "hits" affecting its Area and field units.
7) (2) CDC shall allow ACC access into CDC files.
8) (2) Maintain (at CDC) a limited index file of ACC voice and digital log tapes.
9) (1) Provide the capability to resume field-unit dispatch responsibility from the ACC following ACC Area backup operations.

10) (3) Provide periodic summary reports to each ACC of field-unit activities, status, and transactions.
11) (1) CDC shall maintain voice communications with each ACC via telephone or radio.

b. CDC Requirements in Support of ECC

Upon activation of the ECC, the CDC shall meet the following ECC support requirements:

1) (2) Provide ECC with a current file of field-unit deployment, status, locations, and assignments. File contents shall be available to ECC upon request.
2) (1) Process and adjust current field deployment plans commensurate with ECC request for resources.
3) (2) Provide the ECC with ACC's U. O. personnel and equipment schedule (LAPD Form 14. 3). The file contents shall be available to the ECC upon request.
4) (2) Relay to ECC via appropriate methods all unusual occurrence related reports.
5) (2) Provide ECC with historical intelligence and statistics affecting the designated area as available at the CDC.
6) (2) Provide ECC backup access to police information data files at City, County, State, and Federal levels.
7) (2) Maintain (at CDC) a limited index file of ECC tape logs.
8) (1) Maintain voice communication with the ECC operations.

c. CDC Requirements in Support of MCC

The CDC shall meet the following MCC support requirements:

1) (2) Provide MCC with CDC files and information as defined for the ECC.

2) (2) Communicate with the ECC and affected ACC for backup support to MCC.

3) (1) Process and adjust deployment for resumption of normal operations after MCC deactivation.

4) (2) Maintain a limited index file of MCC tape logs stored at CDC.

5. CDC General Requirements

The CDC shall include capabilities for meeting the requirements indicated below.

a. CDC Response Time

1) (1) CDC equipment response-time requirements are as defined in Section II, paragraph C. 2, with the provision that the operator data entry time shall not exceed 15 seconds per transaction.

b. Continuous Operation Requirements

1) (1) Sustain continuous operations 24 hours per day, 7 days per week.

c. Work Positions Requirement

1) (1) Provide operator and supervisory work positions in the appropriate quantities to allow for the operational and functional characteristics defined in this document (See Table 1 for service traffic loading characteristics through 1990.)

Table 1. ECCCS Service Traffic Loading – 1990

A. Telephone Communications

1.	Calls for service (911)	– Busy hour	820 calls.
2.	Calls for service (911)	– Average hour	402 calls.
3.	Alarm calls	– Average hour	5 calls.
4.	Gamewell calls	– Average hour	5 calls.
5.	Calls transferred/relayed	– Average –	25%
6.	Calls provided with referred information	– Average –	35%
7.	Calls that lead to dispatch action	– Average –	40%

B. *Down-Link Radio Communications (CDC to Field Units)

Average hourly message rates by type

	DIGITAL					VOICE				
Bureau	CAD	DBR	BAN	BFT	TOTAL	DISP	DBR	BAN	BFT	TOTAL
Central	157	2355	180	575	3267	17	17	20	215	269
South	155	2325	178	563	3221	17	17	20	210	264
West	169	2535	195	617	3516	19	19	21	231	290
Valley	157	2355	180	575	3267	17	17	20	215	269

C. *Up-link Radio Communications (Field Units to CDC)

Average hourly message rates by type

	DIGITAL				VOICE				
Bureau	DBI	MAN	MFT	TOTAL	DISP	DBI	MAN	MFT	TOTAL
Central	630	169	2610	3409	14	19	150	46	229
South	620	166	2577	3363	14	18	148	45	225
West	685	182	2811	3678	15	20	162	49	246
Valley	630	169	2610	3409	14	19	150	46	229

*Assumptions
1. 10% traffic remains on voice
2. All random text on uplink is still on voice
3. All downlink data is candidate for digitizes action
4. All data base responses are transmitted
5. All voice uplink messages are "asked" by voice

Glossary
BAN - Base Alphanumeric
BFT - Base Fixed Text
CAD - Computer Aided Dispatch
DBI - Data Base Inquiry
DBR - Data Base Response
DISP - Dispatch
MAN - Mobile Alphanumeric
MFT - Mobile Fixed Text

Table 1. ECCCS Service Traffic Loading – 1990 (cont'd)

*Assumptions (cont'd)

For detailed definition and analysis of data presented in para. B and C, see document JPLR-75-002, dated 24 January 1975, "Statistical Analysis of Radio Communications for the Los Angeles Emergency Command and Control Communications System (ECCCS)."

d. CDC Telephone Communications Requirements

1) (1) Provide at each work position the following telephone communications:

a) L. A. City 911 telephone system.
b) City Centrex system.
c) LAPD Gamewell system.
d) Area Headquarters complaint-desk tie lines.
e) L.A. City emergency services tie lines.
f) CHP Dispatch Center tie lines.
g) Los Angeles Sheriff's Office (LASO) Dispatch Center tie line.
h) LAFD Dispatch Center tie line.
i) Selected neighboring city police dispatch center tie lines.
j) L. A. City private lines to selected city service dispatch operations.
k) Selected private alarm systems.
l) Selected neighboring 911 Public Safety Answering Point (PSAP).
m) Others as designated.

2) (1) Provide, at each CDC work position, telephone communications capabilities to perform the following functions:

a) Call hold.
b) Call transfer to selected telephone networks.
c) Monitor call transfers.
d) Conference calls between selected telephone networks.
e) 911 calling party – forced disconnect (Priority 2).
f) 911 calling party – re-ring (Priority 2).
g) 911 calling party – hold (Priority 3).
h) City Centrex direct dialing.
i) Gamewell system dialing.
j) Outside line dialing.
k) CDC intercom connecting work positions.
l) Others as required.

3) (1) Provide CDC capability to monitor and record the following telephone communications data. Collecting intervals are as short as 1 hour and as long as 8 hours.

a) Number of calls arriving from each of the telephone networks.
b) Number of calls which were not answered by an operator within 10 seconds of the first ring.
c) Number of calls which waited more than 20, 50, and 100 seconds after being answered.
d) Number of calls lost.
e) Number of calls transferred to other agencies.
f) Number of calls handled by each operator position.
g) Average duration of calls handled by each operator position.

e. CDC Radio Communications Requirements

1) (1) Provide at each CDC operator's consoie the following radio communications capabilities:

a) Voice communications via the LAPD mobile networks.
b) Voice communications via the LAPD personal portable radio network.
c) Digital communications via the LAPD mobile digital network.
d) Voice communications with selected other agencies via CLEMARS.

2) Provide CDC capability to monitor the following radio channels:

a) (1) All LAPD radio channels.
b) (1) State CLEMARS radio channels.
c) (2) CHP local radio channels.
d) (2) LASO selected local radio channels.
e) (2) LAFD radio channels.
f) (2) Selected neighboring city police radio channels.
g) (2) Selected Federal service's local radio channels.
h) (2) Local Civil Defense, Coast Guard, and National Guard radio channels.

3) (1) Provide CDC capability to monitor and process LAPD personal emergency trigger signals.

4) (1) Provide CDC capability to monitor and record the following radio communications data on both voice and digital transmission. Collecting intervals are as short as 1 hour and as long as 8 hours.

a) Number of LAPD downlink transmissions per frequency.
b) Number of LAPD uplink transmissions per frequency.

c) Downlink transmission average duration per frequency.
d) Uplink transmission average duration per frequency.
e) Percent of time each LAPD frequency is used.
f) Number of CLEMARS transmissions.

5) (2) Provide CDC capability for CCTV with the ECC, MCC, and ACCs through the LAPD CCTV network.

6) (2) Provide CDC capability to use the LAPD microwave network for "back-up" voice and digital communications between MCCs, ACCs, and fixed communication sites for the following:

a) Telephone communications.
b) Voice communications at any selected operator's position.
c) Data base inquiry and response traffic.

f. CDC Digital Communications Requirements

1) (1) Provide CDC automatic data processing equipment interfacing with the ECCCS digital communications network to communicate with the ECCs, MCCs, ACCs, and fixed monitor and communication sites.

2) (1) Provide CDC automatic data processing equipment interfacing with the City, County, State, and Federal police information files. (See Table 2 for the list of information files and traffic characteristics.)

Table 2. ECCCS Police Information Data Files — 1990

A. Data Files - Data Base Inquiry/Response.

1. AWWS - Wanted Vehicle Files (1)*
2. AWWS - Wanted Person Files (1)
3. CJIS - Stolen Vehicle Files (SVS) (1)
4. CJIS - Wanted Person Files (WPS) (2)
5. CJIS - Automated Property Files (APS) (2)
6. CJIS - Automated Firearm Files (AFS) (2)
7. CJIS - Stolen Bicycle Files (SBS) (2)
8. DMV - Vehicle Registration Files (VR) (1)
9. DMV - Driver License Files (DL) (1)
10. DMV - Automated Name Index (ANI) (1)
11. NCIC - Wanted Vehicle Files (1)
12. NCIC - License Plate Files (1)
13. NCIC - Gun Files (2)
14. NCIC - Wanted Person File (2)
15. PATRIC - Pattern Recognition and Information (3)
16. AFI - Automated Field Interview File (3)

B. Data Base Inquiry/Response Traffic 1990

1. Traffic to DSB**(AWWS) ——— 20.34 characters/sec.
2. Traffic from DSB(AWWS) ——— 58.01 characters/sec.
3. Traffic to (CJIS/DMV/NCIC) CLETS*** ——— 29.97 characters/sec.
4. Traffic from CLETS ——— 111.11 characters/sec.

Note — Above average traffic estimates for 1990 include only the data base inquiring/response into the following files only: A1, A2, A3, A4, A8, A9, A10, A11, A12, and A14 as defined above.

*(1) = numbers in parentheses identifies priority of requirement.

**DSB = Data Services Bureau Interface.

***CLETS = California Law Enforcement Telecommunications Switches Interface via the LAPD's Front End Communications System (FECS).

g. CDC Automatic Data Processing Requirements

1) (1) Maintain a daily historical log of all incidents with their disposition as processed by the CDC.

2) Maintain a street index file for the City of Los Angeles and an extended area 500 yards beyond the City limits for support of Central Dispatch Operations, Area Headquarters, the ECCs, and the MCCs. The street index file shall include the following:

a) (1) L.A. City street names and block numbers correlated to LAPD Reporting Districts (RD). Block numbers at each RD boundary intersection shall be identified.

b) (1) Street names and block numbers correlated to outside concerned jurisdictions for streets outside L.A. City limits.

c) (3) Current street condition and road hazards of significance for all roadways within L.A. City.

d) (2) L.A. City address file for up to 1.3 million addresses. The file shall also include the information of a) and b) above.

3) (1) Provide random access cycle time into the street index file for street name inquiries and for street name and block number inquiries so the overall CDC response time defined in paragraph C.2 (Section II) can be met. File search response when street name and block number are given shall include information of the nearest major intersections.

4) Provide (for the street index file) the data processing capability to select and display the selected area maps at the operator's work position by one or more of the following methods:

a) (2) Map book page and street cross coordinates.
b) (2) Automatically projected micro-fiche map at the operator's console.
c) (3) Graphics capable of identifying streets and major cross intersections.
d) (3) Graphic display capable of identifying the desired street, major intersections, direction of traffic and (when integrated with AVM display) available field units in the vicinity.

5) Maintain a directory of selected residences and businesses as follows:

a) (1) Pertinent intelligence information by address, including recent incidents.
b) (2) Owner by address.
c) (3) Address by owner.
d) (3) Salient structure features for selected businesses and dwellings.

6) Maintain a telephone number directory file capable of supporting operations activities. The telephone number directory file shall include the following:

a) (1) Directory of emergency service agencies at the City, County, State, and Federal levels.
b) (2) Directory of LAPD and L. A. City key personnel.
c) (2) Directory of foreign language translation volunteer service personnel (up to 50 entries).
d) (3) L. A. City telephone number directory identifying registered owner's name, address, and reporting district.

7) (2) Provide the data processing capability to interface operator's positions to the telephone company Automatic Number Identification (ANI) and Automatic Location Identification (ALI) systems.
8) (3) Provide the integration of ANI and ALI system with Automatic Vehicle Monitor (AVM) and street index files to display the calling area, the caller's location, and available field units in the vicinity.
9) (1) Provide capability to log in/out CDC operators.
10) (2) Monitor CDC operator's position status and notify supervision of status changes.
11) (2) Maintain an index file of voice and digital transaction tapes stored at the CDC storage facility.
12) Provide (on demand) at supervisory positions the following information:

a) (1) Telephone statistics (Section III, para. B. 5, d. 3).
b) (1) Radio statistics (Section III, para. B. 5, e. 4).
c) (2) Number of service requests handled per recent shift.
d) (2) Number of service requests delayed in 15 sec intervals up to 2 minutes.
e) (1) Display of number of service request calls and dispatch orders waiting in queue for execution.
f) (1) Number of dispatch orders per recent shift.

13) (3) Maintain CDC employee roster identifying the following:

a) Name, address, telephone number, and identification code.
b) Operator U. O. assignment schedule.
c) Operator weekly work schedule and overtime status.

14) (3) Provide off-line data processing capability required to forecast and schedule operator's daily, weekly, and monthly activities. Data base for operator scheduling shall be obtained from real-time operations and historical data records (ADAM).

15) (3) Provide off-line data processing capability to collate and sort operations summary reports conducted at CDC and ACCs.

16) (3) Provide the processing capability to interface with automatic private alarm systems.

17) (2) Provide on-line test and diagnostics of CDC equipment.

18) (1) Provide (on demand) hard copies of selected display information at supervisors' and Watch Commander's positions.

19) (1) Print out at regular intervals current field unit assignments, locations, and status as required for manual operations back-up recovery. Printing schedule shall be programmable at intervals of from 5 minutes to 8 hours.

20) (1) Provide, at supervisory consoles, the capability to monitor radio, telephone and CRT displays of any operating position.

h. CDC Transaction Recording/Logging Requirements

1) (1) Provide continuous logging of all radio and telephone voice transactions conducted at the CDC. Magnetic-tape voice transaction logs shall include but not be limited to the following:

a) Time of day to the nearest second.
b) Operator's position and his identification code.

2) (1) Provide each operator's position with limited-transaction voice playback capability. Playback requests shall be discretionary and shall not interfere with the continuous tape-log capability defined above. Instant playback shall be capable of selective connection to selected positions and to any of the voice communications circuits available at the operator's position (Priority 3).

3) (1) Provide continuous recording on magnetic tape of all CDC digital communications messages entering and leaving the CDC.

4) (1) Provide continuous logging of:

a) The number of calls for service.
b) The number of dispatches.
c) The number of data base inquiries and responses.

i. CDC Degraded Operating Modes Requirements

1) (1) Provide data processing equipment design characteristics such that no single point of failure will render the total system incapable of operation.

2) (1) Provide CDC operator work positions with the capability of continuing operations in a manual mode.

j. CDC Facility Requirements

The following facility characteristics shall be provided to support CDC personnel and equipment:

1) (1) The CDC shall be designed and implemented in accordance with the L. A. City Building and Safety Code Standards.

2) (1) The CDC shall be located in the fourth and fifth sublevels of the CHE Building.

3) (1) The CDC shall provide environmentally controlled tape storage locker room capable of storing 580 reels of tape.

4) (1) The CDC shall be provided with an environmentally controlled room to contain the required communications and recording equipment supporting the CDC.

5) (1) Recreation/rest facilities capable of sustaining a maximum number of 100 persons continuously shall be provided.

6) (2) CDC closed circuit television security monitor camera locations shall be capable of monitoring the entire facility.

7) (1) CCC conference/planning room shall be capable of containing up to 50 persons.

8) (1) CCC environmental, lighting, power, reliability, and human engineering requirements shall be in accordance with the guidelines defined in Section IV of this document.

C. AREA COMMAND CENTER PERFORMANCE REQUIREMENTS

Area Command Centers (ACC) shall include capabilities for meeting the requirements indicated below.

1. Normal Operations Support Requirements

Area Command Center normal operational support to ECCCS shall include the following:

a) (2) Provide to the CDC daily assignment and U. O. schedule of personnel and equipment. The daily schedule shall include, but not be limited to, the following duty-officer's particulars.

1) Name, rank, and serial number.
2) Police team parameters.
3) Field supervisor's name, rank, and serial number.
4) Field supervisor's mobile unit identification.
5) Communications channels identification.
6) Duty assignment (patrol, traffic, etc.).
7) Watch periods.
8) MDT log-on parameters.

b) (1) Monitor its Area personnel and equipment assignments under CDC control. Personnel and equipment status, assignments, and locations (Priority 2) shall be displayed and printed on demand.

c) (2) Access CDC current and historical data files as required for report generation (including Daily Field Activity Reports), scheduling, and Area management. ACCs shall access the following files for their corresponding Area. Both visual and hard-copy output shall be available at each ACC.

1) CDC service request statistics.
2) CDC dispatch statistics, including units' calls, call durations, and disposition.
3) Police team cross-over statistics.
4) Police information file checks per unit.
5) Police information file check "hits" per unit.
6) Field units' status and recent assignment history.
7) ACC log tapes index file.

d) (1) Monitor personal portable and MDT-generated emergency trigger messages from its Area units.

e) (2) Access police information files at the City, County, State, and Federal levels via the City Front End Communications System (FECS) inquiry network.

2. Back-Up Operations Support Requirements

Area Command Center back-up operational support of the CDC Center, the ECC, and the MCCs shall include the following:

a) (2) Provide basic service request and dispatch data handling capabilities as defined for the CDC in Section III, paragraph B. Each ACC shall be capable of handling 1/15 of the load defined for the CDC.

b) (1) Monitor the CDC and (when activated) the ECC/MCCs for proper Area coverage and control. Assume Area control responsibility when failures occur which render the CDC or the MCCs incapable of sustaining Area control, or when so directed by appropriate authority. ACC monitoring shall include, but not be limited to, the following CDC, ECC, and MCC communications:

1) Voice and digital communications with Area personnel.
2) Personal emergency trigger signaling devices for Area personnel.
3) CDC, ECC, MCC land-line digital communications channels.

c) (1) Maintain radio voice communication with Area mobile units and with any MCC established in the Area.

d) (1) Maintain telephone communications with the CDC and any MCC established in the Area.

e) (2) Maintain digital communications with Area mobile units.

f) (3) Access appropriate data bases at CDC.

g) (1) Area service requests and dispatch activity conducted during back-up control shall be transmitted to the CDC or MCC upon their resumption of Area control.

h) (2) In support of back-up Area control, monitor and communicate with selected outside emergency service agencies in the Area.

3. General Requirements

a) (1) Maintain ACC equipment and personnel capability for continuous operation and support up to 24 hours per day, 7 days per week.

b) (1) Operate 911 Area telephone system as defined for the CDC when required for back-up support. Traffic loads shall be 1/15 of that defined for the CDC.

c) (3) Monitor and interface selected outside agencies' radio communications networks operating in the Area.

d) (2) Generate Daily Field Activity Reports from data collected by the CDC.

e) (2) Maintain a continuous log of voice and digital transactions processed at the ACC during normal and emergency back-up operating modes.

f) (2) Provide, at each operator's position, limited record/instant playback capabilities for voice transactions. Instant playback shall be as provided at the CDC.

g) (1) Provide operation in degraded modes as necessary. Manual mode of operation shall be provided for the Area and shall consist of the same functional equipment and status characteristics as those provided for the CDC.

h) (1) Provide ACC power, environmental, human engineering, and reliability characteristics as specified in Section IV of this document.

D. FIELD UNIT EQUIPMENT PERFORMANCE REQUIREMENTS

Designated LAPD mobile and foot patrol units shall have equipment capabilities to meet the following requirements:

1. Voice Communications

a) (1) Radio car and motorcycle units shall be able to communicate with the CDC 95% of the time regardless of the unit's location in the City.

b) (1) Radio car and motorcycle units shall be able to communicate with other mobile units in their assigned area and with their ACC on frequencies other than the CDC dispatching frequencies.

c) (1) Radio car units shall be able to communicate on all tactical frequencies (except dedicated METRO channel).

d) (1) Radio car and motorcycle units shall be able to continuously monitor their dispatch channel while using tactical frequencies.

e) (1) Radio car and motorcycle units shall be able to simultaneously transmit to the CDC and broadcast over their vehicle's public address system.

f) (1) Radio car and motorcycle units shall be able to continuously monitor voice transmissions to the CDC by other radio cars within their area.

g) (1) Field Supervisors shall be able to monitor one tactical frequency continuously in addition to having the capabilities defined in paragraphs a-f above.

h) (2) Field Supervisors shall be able to monitor more than one tactical frequency continuously in addition to having the capabilities defined in paragraphs a-f above.

i) (2) A Field Supervisors shall be able to transmit and receive on both his dispatch channel and one tactical channel simultaneously.

j) (1) METRO units shall be able to communicate on at least four tactical channels plus one channel reserved for their use.

(k) (2) METRO units shall be able to transmit on all up-link dispatch frequencies.

l) (1) METRO units shall have one tactical channel reserved for their use.

m) (1) METRO units shall have the capability defined in items a), b), d), e), and f) above.

n) (1) Undercover units shall have radio control heads located in an inconspicuous location in the vehicle and shall have the microphone placed so that transmissions can be made from a sitting position without exposing the microphone.

o) (1) Command and Staff Officers units shall have the capability to transmit and receive on all dispatch and tactical channels used in their respective areas.

p) (1) Air-support units shall have capability to receive on all LAPD voice frequencies and monitor at least six frequencies simultaneously.

q) (1) Air-support units shall have capability to transmit on all LAPD up-link and tactical voice frequencies.

2. Digital Communications

a) (1) Radio car officers and specialized personnel shall be able to access and receive responses from data bases listed in Table 2 via their MDT.

b) Radio car officers and specialized personnel shall be able to communicate the following types of messages with the CDC via their MDT.

1) (1) Unit status, including "officer needs help."
2) (1) Free text, up to 400 characters per transmission.
3) (2) Unit location, or data from which the location can be derived.
4) (1) Inquiry and response to data bases per Table 2.
5) (1) Officer and terminal identification.
6) (1) Request for time of day and response.

7) (1) MDT test pattern.

c) (1) Radio car officers and specialized personnel shall be able to address messages to and receive digital messages from other radio cars equipped with MDT.

d) (1) Print selected digital messages in Field Supervisor's and Team Leader's radio cars. Messages to and from cars assigned to his supervision to be printed are:

1) All up-link messages except data base inquiries.
2) All down-link messages.
3) All car-to-car messages.

e) (1) Field Supervisors' and Team Leaders' radio cars shall receive nearly simultaneously with their field unit any digital notification of a Code 6 Charles and other selected messages.

f) (2) Staff and Command Officers shall have the capability defined in items a)-e) above.

g) (2) Motorcycles shall have the capability defined in items a)-c) above.

h) (3) Air-support units shall have the capability defined in items a)-c) above.

i) (1) Each MDT shall be capable of interfacing with the following:

1) Teleprinter
2) AVM equipment
3) Commercially available land mobile radios.

j) (1) Each MDT-equipped vehicle must be able to communicate on all LAPD digital radio channels.

k) (1) Teleprinters shall have the capability for:

1) Replacing paper in the field by the Field Officer.

2) Reading the last line printed
3) Adjusting the light intensity for night viewing.

l) (1) The MDT, radio equipment, and base processing shall provide an effective data thruput rate of at least 90 characters per second per radio channel from 95% of the locations in the City, including all:

(1) Digital synchronization, addressing, and error coding.
(2) Multiple-message transmissions

m) (1) Each MDT shall have an alerting method to inform officers of an incoming message.

n) (1) Each MDT shall be able to append an AVM location message of up to 64 bits in length to each MDT transmission, except automatic acknowledgement. Upon receipt of a digital message requesting AVM data, the MDT shall automatically report its location to the CDC.

3. Mobile-Unit Communications – General

a) (1) All communications, including MDT equipment mounted in the front seat of a radio car, must:

1) Fit into existing locations
2) Not interfere with officer evasive action and vehicle exit
3) Be protected to prevent officer injury
4) Be mounted to minimize risk of being stolen
5) Be mounted for easy removal to repair or replace
6) Be impervious to shock, dust, or other foreign material; e.g., coffee, etc.
7) Take into account Federal and State regulations regarding vehicle safety restraints and data security.

8) Meet CLETS and NCIC requirements for operator identification and control.

b) (1) Include in all transmitters a fail-safe provision to prevent carrier emission due to failure or for extended periods of modulation.

4. Field-Unit AVM Equipment Requirements

a) (2) Provide field units' AVM equipment with tamperproof characteristics.

b) (2) Provide for field units' address code assignments of up to 2000 units.

c) (2) Provide interfacing with the MDT to communicate AVM information of up to 64 bits.

d) (2) Locate AVM equipment in the trunk compartment with the exception of fixed-site and data processing equipment.

e) (2) Design field units' AVM equipment to operate within the power, shock, vibration, and temperature requirements defined for mobile equipment in Section IV of this document.

f) (2) Provide AVM fixed-station and mobile unit equipment and processing to determine vehicle position only upon request of the CDC and transmission of MDT messages except for MDT automatic acknowledgement.

g) (2) Provide AVM fixed-station and mobile unit equipment and processing such that the reported location of a vehicle shall not be in error from the vehicle's true position by more than the amount defined below. The true position is defined as the vehicle's location at the time the information is presented to the user. The error shall be less than that allowed for at least 95% of all location transmissions. The error (in feet) shall be less than

$$D + \frac{44}{3} V$$

Where V is vehicle average velocity in MPH, and D is defined below with relative priority under the overall priority of this paragraph:

a) (1) D = 500 feet
b) (2) D = 300 feet
c) (3) D = 100 feet

h) (3) Provide interfacing with the vehicle doors, ignition key, MDT out-of-car status key, and odometer mileage reading device.

5. Requirements for Personal Communications Equipment for Out-of-Car and Foot Patrol Use.

a) Provide portable radio sets with operational capabilities as follows:

1) (1) Voice communications with the CDC from at least 100% of the locations within the City.

2) (1) Voice communications between other portable set users in the same Area Command, mobile and air units, MCCs, and the assigned ACC.

3) (1) Transmissions on any one of at least 4 selectable frequencies.

4) (1) Reception on any one of at least 4 selectable frequencies.

5) (1) Transmission of a personal emergency signal which will uniquely identify up to 2000 units.

6) (1) When the personal emergency trigger has been activated, it shall send an intermittent digital message to the CDC and assigned ACC, except when interrupted by a voice transmission from the portable radio.

7) (1) Automatic emergency trigger carrier cutoff after a specified time.

8) (1) Fail-safe voice carrier transmission cutoff after a specified time.

9) (1) Battery capability to operate without recharge for 12 hours with utilization of:

(a) 10% transmit
(b) 45% receive
(c) 45% monitor

In addition, one period of 5-minute emergency trigger transmission shall be possible.

10) (1) Ability to test the portable emergency trigger function prior to going on duty.

b) (1) Provide portable radio sets with the following typical characteristics:

1) Secure storage capability in officer's equipment belt, and emergency trigger activation while in the belt.
2) Weight of 5 pounds or less.
3) Dust and liquid proof.
4) Exterior color mat black or dull dark blue.
5) Of such size that, when secured to the officer's equipment belt, the set does not interfere with the officer's normal out-of-car physical activites and vehicle driving..

c) (1) Provide the means for battery charging of portable radio sets. Battery charing equipment shall be in accordance with manufacturer recommendations.

E. FIXED-SITE COMMUNICATIONS PERFORMANCE REQUIREMENTS

The fixed monitor and communications sites shall include capabilities for meeting the requirements indicated below:

1) (1) Monitor and communications equipment at each site shall be capable of operating continuously 24 hours per day, 7 days per week.

2) (1) Support mobile and personal communications as defined in Section III, paragraph D.

3) (1) Support ECCCS operations centers as defined in Section III, paragraphs A, B, and C.

4) Provide the interface at the CCC, ACCs, fixed communication sites, and preselected MCC sites to LAPD's microwave communications network for the following functions:

a) (1) ECCCS operations administrative voice communications.
b) (1) ECCCS CCTV communications.
c) (1) ACCs to CCC limited 911 trunk back-up communications.
d) (1) ECCCS operations digital communications back-up.

5) (1) Establish the ECCCS high-speed digital (HSD) communications network to provide for the following traffic with the specified characteristics:

a) (1) Between each ACC and the CCC.
b) (1) Between each ACC and preselected MCC sites in their Area.
c) (1) Between ACCs in adjacent Areas.
d) (1) Between the CCC and fixed communication sites handling digital traffic.
e) (1) Between ACCs and fixed communications sites handling digital traffic.

f) (3) Between the CCC and selected L. A. City, neighboring city, County, State, and Federal agencies' dispatch centers in the L. A. Area and neighboring 911 PSAP(s).

g) (3) Between each ACC and selected service agencies in their vicinity.

h) (1) Provide ECCCS HSD communications network-conditioned lines as required to maintain a maximum character error rate of 1 in 10^5, at transmission data rates of up to 9600 bits per second.

i) (1) Provide ECCCS HSD communications network computer interfaces in accordance with Electronic Industries Association standard EIA-RS-232-C.

6) Provide the ECCCS voice radio communications network with the following characteristics:

a) (1) Provisions for the required number of radio frequencies needed to support LAPD voice communications through 1990. (See Table 1 for voice radio traffic loading characteristics.)

b) (1) Transmitter sites shall provide signal levels at all mobile and personal portable locations within the City such that response-time requirements defined in this document are met.

c) (1) Fixed receiver sites providing signal selection for best reception of mobile and portable radio sets transmitting within L. A. City limits and meeting all response-time requirements defined in this document.

7) Provide ECCCS personal emergency trigger signaling receiving equipment with the capabilities to meet the following requirements:

a) (1) Detect triggered messages from any point within L. A. City.

b) (1) Process detected triggered messages at the receiving sites and relay them to the CCC and most probable affected ACC or to the MCC.

c) (1) Include the monitor sites' location identification code with each triggered message detected and relayed to the CCC and ACC/MCC in the Area for location determination of the emergency.

d) (2) Provide for the remote testing of emergency trigger monitor sites by the CDC.

8) (2) Provide AVM fixed-site installations, as part of the AVM system, which shall meet the overall requirements defined in Section III. D, paragraph 4 of this document.

9) (2) Provide AVM mobile and fixed-site test capability. This test capability shall be able to detect any non-functioning fixed-site location.

10) Provide a Mobile Digital Communications network and associated data processing equipment supporting the field units, CCC, the ACCs, and the MCCs. The requirements for this network are to:

a) (1) Establish a radio communications network capable of handling mobile digital communications (including AVM) through 1990. (See Table 1 for mobile digital communications traffic loading characteristics.)

b) (1) Provide each radio communications channel supporting mobile digital communications with the capability to support the thruput defined in Section III, paragraph D.2,12).

F. EMERGENCY CONTROL CENTER PERFORMANCE REQUIREMENTS.

The Emergency Control Center (ECC) shall include capabilities for meeting the requirements indicated below.

1. Coordinating and Reporting Requirements

a) (2) In order to coordinate the Department's emergency control activities, receive the following data from the CDC or the ACC.

1) A report identifying the U. O. nature, scope, location, and current deployment at the scene.
2) A report of limited historical intelligence information concerning the U. O.
3) A report of current CDC controlled field unit status, assignments, and locations.
4) A report of ACC U. O. contingency personnel and equipment availability.

b) (2) Establish the appropriate communications with the MCC and the concerned ACC for receipt of:

1) Current U. O. intelligence reports for coordination with the Intelligence Control Center (ICC).
2) Current U. O. injury reports for coordination with the Casualty Information Center (CIC).
3) Chronological logs of MCC or ACC U. O. activities and situation reports.
4) Receive and process MCC or ACC requests for personnel, equipment, and supplies.
5) U. O. statistical data report.
6) Arrestees detail and arrest recap.
7) U. O. damage recap.

2. Data Processing Requirements

a) (2) Provide the following data processing capabilities in order to process MCC or ACC requests for personnel, equipment, and supplies:

1) Monitor (in real time) the status of all deployed forces under CDC, MCC, and ACC control.
2) Correlate MCC or ACC resources requirements with available resources such that adequate LAPD support is maintained in the areas not affected by U. O.
3) Process and notify the CDC and concerned ACCs of their units' redeployment to support the MCC or affected ACCs.
4) Process request for resources from outside LAPD agencies as required to support specialized activities.
5) Maintain a file of LAPD's personnel special skills and capabilities.
6) Maintain a file of LAPD's equipment and their tactical capabilities.
7) Maintain a file of supplies and spare equipment. Supplies and equipment inventory file shall identify current storage location and property ownership assignments.

b) (2) Process and issue on demand the following reports:

1) Current situation reports.
2) Injury/death and property damage reports.
3) Personnel and equipment status reports.
4) Chronological U. O. situation reports.
5) Official Departments' situation report.
6) News release reports.

c) (3) Provide the data processing capability to assist in the searching, sorting, and correlation of intelligence information gathered at the scene and as available from LAPD data files, and City, County, State, and Federal police information systems.

d) (2) Process and generate graphic display capability for selection and projection of the following:

1) Area street maps.
2) High-resolution Area section maps to 100-ft. resolution.
3) Topographic Area maps.
4) Key building characteristics and floor plan.
5) Strategic/tactical deployment road-block configuration at predetermined areas.
6) L. A. City electric and telephone lines networks.
7) L. A. City water and hydrant pipe system.
8) L. A. City flood control and sewer system.
9) L. A. City land-line communications system.
10) L. A. City microwave/radio communications system.
11) L. A. City bomb shelter locations.
12) MCC permanent and contingency deployment locations throughout the City of Los Angeles.

3. (2) Communications Requirements

a) A minimum of 19 centrex and 5 outside telephone lines.
b) A minimum of 4 Gamewell lines.
c) A minimum of 5 direct tie lines connecting:

1) Pacific Telephone
2) General Telephone
3) CHP
4) LAFD
5) DWP

d) Selected operating positions shall have direct tie lines to their counterpart in the MCC.
e) The ECC shall be provided with a teletype system. The terminals shall be the KSR type, and shall be able to transmit up to five identical messages simultaneously. Also a CLETS terminal shall be provided.

f) Voice radio capability to communicate on all LAPD channels.
g) Voice radio capability to communicate on selected LA City Fire Department (LAFD) and Priority (2) selected LA county FD channels.
h) Voice radio capability with police agencies using the California Law Enforcement Mutual Aid Radio System (CLEMARS) frequency.
i) Voice radio capability on the LASO tactical frequencies and with the CHP.
j) Voice radio capability on the hospital communications network.
k) Digital radio capability with all users of MDTs.
l) TV displays shall be provided. The displays shall be able to receive commercial TV or LAPD closed circuit TV via the microwave networks.

4. General Requirements

a) When actuated, sustain continuous operations 24 hours per day, 7 days per week. Operating personnel shall support operations on a watch basis of 12 hours each day or as defined by the ECC Commander.
b) (2) Provide the required quantity of operating, supervisory, and Command personnel work positions capable of supporting simultaneous U. O.'s affecting the City of Los Angeles. Positions for the following personnel shall be provided:

1) LAPD Department Commander.
2) ECC Commander.
3) ECC Executive Officers.
4) Situation Report Officers.
5) Personnel Officers.
6) Procurement Officers.
7) Intelligence Officers
8) Press Relations Officers.
9) Outside Agency Liaison Representatives.

c) (2) Provide for ECC access to all CDC, ACC(s), and MCC data files.

d) (2) Provide for ECC access (in support of the MCC) to data files available at all LAPD operations centers, City, County, State, and Federal police information system.

e) (2) Provide the data handling and processing capability to interface the ECC with the MCC over the ECCCS high-speed digital communications network.

f) (3) Provide the data handling and processing capability to interface the ECC with City, other City, County, State, and Federal service agencies' data processing systems.

g) (2) Maintain a magnetic-tape log of all digital transactions conducted at the ECC. The log shall include a cross reference to voice log tapes for the same transaction. Time sequence shall be recorded to the nearest second for each recorded transaction.

h) (2) Provide for the continuous logging of all voice and television transactions on magnetic tape. Voice log formats shall be as defined for the CDC. Television monitor magnetic tapes shall include time marks on the voice channel.

i) (2) Provide for instant voice and television monitor playback capabilities at each work position.

j) (1) Locate ECC facilities at the fourth and fifth sublevels of CHE, co-located with the CDC. Facilities requirements shall be as defined for the CDC.

G. MOBILE COMMAND CENTER PERFORMANCE REQUIREMENTS

The MCC shall include capabilities for meeting the requirements indicated below:

1) (2) Establish the MCC in block modular form so as to accommodate flexible deployment plans.

2) (2) When deployed, sustain continuous operation 24 hours per day, 7 days per week at the scene of an incident.

3) (2) Each mobile vehicle comprising the total MCC shall conform to City, State, and Federal vehicle and safety requirements and others as defined in subsequent paragraphs.

4) (2) Provide each mobile equipment van with the following characteristics and equipment:

a) Height, width, and length shall be determined, based on selected equipment. Maximum outside height shall be less than 13.6 feet.

b) Equipment vans shall be of the "Air-Cushion Ride" type, capable of absorbing excessive shocks and preventing damage to internally mounted equipment.

c) Equipment environmental control unit shall be capable of supplying the equipment manufacturer's recommended air volume at 50° F at sea level. Cooling air shall be maintained at 45 ± 5% relative humidity.

d) All equipment shall be accessible for maintenance.

e) Roof-mounted antennas shall be easily erectable and aligned by one man. Roof walkways shall be skidproof.

f) Equipment mounted in the van shall include:

1) Radio transmitters and receivers for required communications. Included shall be handheld portable and personal emergency trigger signal frequencies.

2) Commercial VHF and UHF television monitor equipment.

3) LAPD Mobile Digital Terminal (MDT) radio transmitter/receiver and data processing equipment.

4) Telephone communications via commercial and Gamewell systems.

5) Teletype equipment.

6) MCC intercommunications system.

7) Microwave equipment for high-speed digital, CCTV, and voice communications with the Communications and Command Center and the ACC.

8) Data processing and digital recording equipment used in support of MCC operations.

9) Voice and television recording and playback equipment.

10) Telephone/microwave digital communications modem equipment.

11) Power monitor, power standby, and mobile radio AC/DC converter equipment.

12) Interface/patch panel equipment capable of interconnecting MCC operations mobile vans and external telephone, microwave, and power sources.

13) Equipment and maintenance lighting shall not interfere with raster scan CRT displays. External floodlights illuminating the van and standby power and environment control units shall be included.

14) Storage area for spare modules, maintenance manuals, retractable antennas, and ladders.

5) (1) Provide each operations support mobile van with the following characteristics:

a) Height, width, and length shall be determined, based on the number of required operator work positions as follows:

1) Operations Officer
2) Planning Officers
3) Control Officers
4) Complaint/Dispatch Operators
5) Intelligence Officers.
6) Radio/digital/Emergency Trigger Monitor Operator positions

7) Personnel Officer
8) Logistics Officer
9) Maintenance Officer
10) Transient personnel.

b) A personnel and equipment environmental control unit shall be capable of maintaining an average temperature of 68-72°F at a relative humidity of 40-60%.

c) The operations area shall be soundproofed such that the equipment and personnel noise level shall be maintained at a comfortable level in accordance with Human Engineering practices.

d) All equipment shall be accessible for maintenance.

e) Operations area lighting shall not interfere with scan raster CRT display-type units.

f) Storage area for spare modules, maintenance manual, maps, and communications and power lines.

g) The operations van shall be provided with a passageway to permit multiple-van interlock configurations. A passageway shall provide for a minimum width of 6 ft. and height of 7.5 ft. Intervan passageways shall be covered, insulated, and soundproofed.

h) All operations vans shall be provided with hydraulic-leveling devices.

i) Operations work positions shall include the same capabilities as those provided at the ECC.

j) The MCC operations van shall be provided with the same operations and processes as those defined for the ECC through the mobile equipment van.

6) (2) The MCC shall have the capability of voice radio communications on all LAPD voice radio channels and with users of CLEMARS.

7) (2) The MCC shall have the capability of digital communications with all LAPD users of MDTs.

8) (2) The MCC shall have an internal telephone system as well as being capable of connecting to the commercial telephone system. Connection to the City telephone network via the City microwave system shall also be possible.

9) (2) Key MCC operating positions shall have direct telephone tie lines to their counterpart at the ECC.

10) (2) The MCC shall have the capability of teletype communications with all users of the LAPD teletype network.

11) (2) The MCC, under the direction of a Field Commander, shall support the four organizational elements defined below:

(a) Operations Section
(b) Intelligence Section
(c) Personnel Section
(d) Logistics Section.

12) (2) The MCC shall utilize automatic data processing techniques to assist in performing its functions. All CRT terminals will be identical and shall be capable of being initialized for any function.

13) (2) The Operations Section shall have the capability to:

(a) Display the status and resources of all manpower resources and equipment assigned to the Field Command Post (FCP).
(b) Monitor the status and activities of units involved in the field.
(c) Perform limited computer-aided dispatching of units assigned to the FCP.
(d) Compile a log of dispatch messages.

14) (2) The Intelligence Section shall have the capability to:

(a) Enter selected intelligence reports.
(b) Retrieve intelligence reports on CRT or hard-copy printers.
(c) Monitor commercial or closed-circuit television.
(d) Televise, video record, and play back local scenes.
(e) Enter and display:

1) Arrest recap
2) Casualty recap
3) Arrestee details
4) Damage recap
5) Logistics information
6) Personnel information

15) (2) The Personnel Section shall have the capability to:

(a) Obtain the status of available LAPD resources.
(b) Enter and monitor the status of information regarding personnel assigned to the MCC.
(c) Provide a summary of data for U. O. reports.
(d) Assist in field identification, processing, and detention of arrestees at the field-unit jail.

16) (2) The Logistics Section shall have the capability to:

(a) Enter and monitor the status of equipment resources assigned to the FCP.
(b) Store all necessary supplies for rapid retrieval during the U. O.
(c) Request additional equipment during the U. O.

17) (2) Office and conference space shall be provided for the Field Commander. His office shall be capable of monitoring all displays, including TV.

18) (2) The MCC vans shall have the capability to use fixed-site power or to use on-board power sources.

19) (2) Predetermined MCC sites shall be established. Each shall have power, telephone, and microwave antennae installed.

SECTION IV

SYSTEM DESIGN CRITERIA

A. GENERAL

This section provides the ECCCS system general design criteria and practices that shall be observed in the design and implementation of the system's assemblies, software, and facilities.

B. ECCCS SYSTEM DESIGN CRITERIA

In the design and implementation of the ECCCS system the following design criteria shall be observed:

1) The system design concept shall provide for the logical separation of major functions into individual modular blocks consistent with incremental implementation.

2) Each major ECCCS system function shall provide its own data base where required to meet response time or reliability requirements and interfaces required to sustain degraded "stand-alone" operations. For example, failure of the MDT system shall not prevent the CAD system from being used.

3) The ECCCS system shall be designed such that manual mode LAPD operations could continue in case of partial or complete failure of any or all automatic data processing equipment. It is mandatory that telephone complaint answering, dispatching, and radio communications not be prevented in case of automatic data processing equipment failures.

4) Selected critical ECCCS system functions shall be provided with redundant interfaces and processors.

5) The design of the ECCCS system shall include provisions for degraded modes of operation.

6) The ECCCS system design shall provide for the standardization of equipment, interfaces, and processes to achieve the following desirable characteristics:

a) Interchangeability between assemblies and peripherals performing similar functions.
b) Reduction of spare parts and assembly inventories.
c) Portability of software such that any given processor in a complex is capable of being initialized to perform any given function.
d) Minimization of operator and maintenance training requirements.

7) The ECCCS system shall be designed to utilize automatic data processing techniques to minimize the number of manual entries, the amount of information interpretation, and operator skill levels where such minimization is cost effective or necessary to meet other system objectives; e.g., response time.

8) ECCCS system and subsystem software general requirements and practices shall be in accordance with LA Data Services Bureau Policy, Procedures and Standards, 1970.

C. ECCCS SUBSYSTEMS

The ECCCS system shall be composed of the following subsystems.

1) Computer Aided Dispatching (CAD) Subsystem

The CAD subsystem shall include all hardware and software for:

a) The required data processing capabilities to aid in the emergency-complaint service request and field-unit dispatch and follow-up processing.
b) The required data processing capabilities to maintain field units' deployment, status, current-location information, and emergency trigger condition.

c) The required data processing capabilities to control graphics display and to correlate and generate computer-based graphics requirements.
d) The capabilities for signal conditioning, recording, and playback of all CAD digital transactions conducted at the ECCCS.
e) The capability to monitor, test, and evaluate its own performance relative to the requirements set forth in Sections II and III of this document.

2) Mobile Digital Terminal (MDT) Subsystem

The MDT subsystem shall include all hardware and software for:

a) Alphanumeric computer terminals in the LAPD mobile fleet.
b) All interfaces with the Radio Communications Subsystem for transmission of information in a digital form.
c) The required data processing capabilities to allow vehicles of the LAPD mobile fleet to request and receive data from police information files, transmit their status and location, and to be dispatched to requests for police service.
d) The interface with the CAD subsystem, the AVM subsystem, and communications lines to the local, State, and Federal police information files.
e) The capability to monitor, test, and evaluate its own performance relative to the requirements set forth in Sections II and III of this document.

3) Radio Communication Subsystem (RCS).

The RCS shall include all hardware and software for:

a) Voice and digital radio capabilities required to support fixed, mobile, and hand-held portable communications, including emergency trigger signals.

b) The interface with all communications networks to linking ECCCS operating centers.

c) The capability to monitor, test, and evaluate its own performance relative to the requirements set forth in Sections II and III of this document.

d) The capabilities for signal conditioning, recording, and playback functions for all telephone and radio voice and CCTV transactions.

4) Automated ACC Subsystem
The ACC subsystem shall provide the equipment required for the day-to-day and back-up ECCCS support at each Area Headquarters.

5) ECC Subsystem
The ECC subsystem shall provide the equipment to operate the ECC with its specialized management and control functions.

6) MCC Subsystem
The MCC subsystem shall provide the equipment to operate the MCC with its specialized management and command functions.

7) AVM Subsystem
The AVM subsystem shall provide the required sensors, hardware, and software for the real-time computation of field units' location and motion.

8) Facilities Subsystem
The facilities subsystem shall provide the required power, lighting, air-conditioning, security, and other needs to enable the ECCCS equipment and personnel to function in normal and U. O. conditions.

D. ECCCS INTERFACING SYSTEMS

The ECCCS shall interface with the following City systems:

1) Police Information File Interface.
The ECCCS shall interface with Data Service Bureau 370/155 for AWWS data files and with the FECS CC40 for CLETS traffic to DMV,

SVS, WPS, and NCIC to provide access to police information files at the City, County, State, and Federal levels.

2) Telephone Communications System (TCS).
The TCS shall provide the ECCCS with telephone communications networks which include the 911 Emergency Telephone System, Gamewell Telephone, Private Alarm System, and dedicated private communications ringdown service to other service agencies.

3) Microwave Communications System (MCS).
The MCS system shall provide the ECCCS with communications capability for CCTV, high-speed digital communications, and inter-City voice communications.

4) CCTV System.
The ECCCS shall interface with the CCTV system for operational support of the CDC, Area Headquarters, ECC, and MCC.

5) Emergency Operations Center (EOC)
The ECCCS shall interface with the EOC for coordination of City resources during major disasters.

E. ECCCS GENERAL DESIGN CONSTRAINTS

The following requirements shall be observed in the ECCCS system, subsystem, and assembly design and implementation:

1) All subsystems shall provide the capability of self test. Key monitoring test points shall be provided for use by test personnel.

2) Assemblies shall be replaceable without requiring tuning and adjustment of interfacing assemblies.

3) All fixed sites and MCC vans shall be capable of continous operation directly or derived from 60 ± 0.5 Hz power.

4) Fixed sites and MCC vans shall include the capability for:

a) Main power networks powering heavy equipment (such as air conditioning compressors) shall be separated from sensitive electronic equipment power.

b) Electronic equipment performing critical functions shall be provided with appropriate power-fault isolation to sustain individual operations.

c) Standby power shall be provided. Standby power switch-over shall be accomplished without interruption of power to the leads in case of commercial power failure.

d) MCC radio equipment shall be provided with AC to DC power conversion equipment with standby battery power and switch-over capability.

5) Mobile units' and MCC mobile radio communications equipment shall be capable of operating from 12 vdc batteries and at voltage levels encountered during engine starting.

6) All fixed-site cables shall be routed between equipment in cable trays or ducts, and shall include the following requirements:

a) Cables and connectors shall be standardized for a given function, except for required lengths.

b) All cables shall be visibly labeled with from/to destination markers.

c) Signal and power cables shall be routed separately.

d) All cables and connectors shall be designed to meet the equipment manufacturer's specifications.

7) Equipment-grounding provisions shall include the following:

a) Fixed sites and MCC vans shall be provided with a ground bus accessible to all electronics equipment. The ground bus shall terminate at a central point for interconnection to the facility power ground. Mobile equipment shall be grounded to the vehicle frame.

b) All equipment and cabinet enclosures shall include adequate grounding to the frame chassis.

c) All equipment chassis enclosures shall be grounded as required to meet RFI or EMI requirements defined in the equipment vendor's specifications.

8) Environmental requirements for fixed and mobile sites shall be as follows:

a) All equipment and spares shall be capable of withstanding non-operating storage temperatures from 0° up to 160°F.

b) All stored equipment shall be packaged to withstand humidity extremes, condensation, salt atmosphere, rain, smog, sand, and dust.

c) All equipment required to operate in unprotected facilities shall be capable of operating in accordance with the following conditions:

1) Temperatures in the range of 0°F to 120°F.
2) Sun radiation of 310 BTU per hour per sq. ft.
3) Humidity, including condensation.
4) Rain and water sprays.
5) Sand and dusty environments.
6) Winds of up to 25 MPH average with 85 MPH gusts.

d) All equipment required to operate in protected environmentally controlled facilities shall be capable of operating in accordance with the following conditions:

1) Temperatures from 60 to 90°F.
2) Humidity from 20 to 80 percent.
3) Ventilation of outside fresh air as required to maintain above conditions.

e) MCC and fixed-site personnel working environment shall be controlled for the following:

1) Temperature range of 70° to 78°F.
2) Humidity from 30 to 60 percent.
3) Temperature cycling within ±1.5°F.
4) Ventilation of 15 CFM of fresh outside air.
5) Emergency ventilation rate as required to maintain a temperature within ±10°F of controlled temperatures defined above.

f) All ventilation systems shall include air filtration in accordance with Federal Specification F-F-300.

g) All equipment requiring added environmental control beyond the specified ranges defined above shall include its own peculiar requirements.

h) Mobile field-unit equipment shall be capable of operating under the environmental characteristics defined in EIA Standard RS-152A.

9) Human engineering requirements principles and criteria shall be observed in the design and implementation of ECCCS subsystems and facilities. Human engineering design criteria shall be as applicable in accordance with:

a) "Human Engineering Guide for Equipment Designers," Second Edition, by Woodson, W. E., and Conover, D. W., Berkeley, University of California Press, 1964.

b) "Human Engineering Design Criteria for Military Systems, Equipment and Facilities," MIL-STD-1472 A, 15 May 1970.

10) ECCCS system, subsystem, equipment reliability goals shall include equipment reliability and maintainability in accordance with best commercial practice.

11) ECCCS system, subsystem, and assembly front panels and cabinet color shall be non-reflecting gray baked enamel. Front panel nomenclature shall be engraved and filled with black filler paste.

12) ECCCS system, subsystem, and assembly documentation shall be in accordance with best commercial practices and as defined in the Data Service Bureau "Policies, Procedures and Standards," dated 1970.

END