ICS Command Assistant — Full Application Design Document (Windows Program)

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1. Overview

### Purpose:

A desktop-based, modular Incident Command System (ICS) tool designed for Emergency Services, Search and Rescue (SAR), and disaster operations.

### Platform:

Windows (standalone .exe)

### Architecture:

* - Frontend: React + Electron
* - Backend: FastAPI (Python)
* - Database: Dual DB system (Master + Mission)
* - Integration: Full offline capability; Mobile app sync (Phase 9)

2. System Architecture

* - Frontend: Electron app with React UI
* - Backend: FastAPI Python server
* - Communication: REST API + WebSocket for real-time sync

### - Data Storage:

* - Master DB: Personnel, equipment, certifications, form templates
* - Mission DB: Tasks, logs, operational data

3. Module Overview

1. Command — Mission setup, settings

2. Planning — Strategic tasking, SITREPs

3. Operations — Task assignment, deployments

4. Logistics — Equipment, supply tracking

5. Communications — Chat, 213, notifications

6. Medical and Safety — ICS 206, safety messages

7. Intel — Maps, weather, SITREPs

8. Liaison — Inter-agency coordination

9. Personnel & Role Management — Org hierarchy, certs, ranks

10. Reference Library — Linked SOPs, guides

11. ICS Forms & Documentation — Digitized, fillable forms

12. Finance/Admin — Reimbursement, costs, time logs

13. Status Boards — Operational views, dashboards

14. Public Information — Media logs, bulletins

15. Mobile Integration

16. AI Integration

17. Search and Rescue Toolkit

18. Disaster Response Toolkit

19. Planned Event Toolkit

20. Initial Response Toolkit

4. UI Layout

* - Top Navigation Bar: Tabs by Directorate (e.g., Command, Planning)
* - Sidebar: Context-specific tools and filters
* - Main Panel: Logs, maps, forms, dashboards
* - Modals/Drawers: Form editors, entry dialogs
* - Multi-window Support: Phase 8

5. Key Features

* - Real-time chat (IM and ICS 213 style)
* - Tasking system with 214 integration
* - Status boards for resources, teams, units
* - GIS mapping with KML/GeoJSON support
* - Audit trails and change logs
* - Form versioning, auto-fill, dependencies
* - Drag-and-drop uploads
* - LAN/WebSocket collaboration
* - Time sync via GPS/NTP
* - Embedded sandbox/training mode

6. Design Phases

## Phase 1: System Framework & Command Module

* - Electron/React UI scaffold
* - FastAPI modular backend
* - Master + mission DB framework
* - Role-based login system
* - Mission creation and selection tools
* - Top bar navigation with module nesting

## Phase 2: Planning, Operations, and Personnel Core

* - Planning module for strategic tasking, SITREPs, and time tracking
* - Operations task assignment dashboard with team tracking
* - Personnel roster with org hierarchy and certifications
* - ICS 214 manual logging interface
* - Hotkey-accessible quick-entry form panel
* - Form dependency hints for ICS workflow validation
* - Printable reports for tasking and logs

## Phase 3: Forms Engine & Reference Library

* - ICS Forms module: ICS 213, 214, 206, 205, 205A
* - Backend template engine and field digitization system
* - Auto-fill support based on personnel, assignments, and task data
* - Custom form uploader and digitization tool
* - Versioned form history with rollback capability
* - Reference Library browser for linked SOPs, agency documents
* - Related Forms feature for interlinked form sets

## Phase 4: Communications & Public Information

* - Informal chat messaging system (IM-style)
* - ICS 213 structured message form with approval/reply tracking
* - Notification system for task updates, alerts, message replies
* - Drag-and-drop file attachments in chat/messages

### - Public Information Module with:

* - Press log
* - Bulletin composer and scheduler
* - Approval workflow for media release
* - Exportable press packets

## Phase 5: Logistics, Medical, Intel, and Mapping

* - Logistics inventory manager with supply tracking
* - Medical log entry system (ICS 206)
* - Safety message interface

### - Intel dashboard with:

* - Weather tools
* - SITREP builder
* - GIS mapping engine (KML/GeoJSON import, task plotting)
* - Layer toggles (search areas, hazards, units)
* - Time synchronization with GPS/NTP

## Phase 6: Status Boards & Workflow Automation

### - Dedicated Status Boards module:

* - Resource, team, medical, comms, task boards
* - Manual and real-time update support
* - Filtering, sorting, PDF export/snapshots
* - Auto-generation of ICS 214s from task/chat data
* - Form dependency hints and link suggestions
* - Task-based alert scheduler (reminders, overdue warnings)
* - LAN/WebSocket support for collaborative usage

## Phase 7: Finance/Admin & End-of-Mission Tools

### - Finance/Admin module:

* - Personnel time tracking
* - Cost center management
* - Reimbursement logs
* - Audit trail for system-wide changes and edits
* - End-of-mission export: Full ZIP + printable reports
* - Embedded sandbox mode for training/testing
* - Global and module-level search + filter support

## Phase 8: Multi-Window UX, Packaging & Offline Ops

* - Multi-window display support (maps, logs, forms)
* - System tray integration for background alerts
* - Self-contained .exe bundling (PyInstaller + Electron)
* - Mission archive system: backup, restore, snapshot
* - Full offline functionality validation

## Phase 9: Mobile App Integration

* - Cross-platform mission sync (desktop ↔ mobile)
* - Tasking, 214s, chat, and logs imported from mobile
* - Mobile device status reflected in Status Boards
* - Shared form templates for consistency
* - Manual LAN/USB import/export supported

## Phase 10: AI & Advanced Feature Wishlist

* - AI-generated SITREPs from logs and chat
* - Smart form filler using existing data context
* - Natural language search across app modules
* - Voice-to-text support for logs and forms
* - AI-based trend analysis and incident forecasting
* - QR-based field check-in/out tool
* - Task prioritization engine
* - Auto-form recommendation engine (e.g., 215/204 layout builder)

7. Future Considerations

* - Expand mobile app capabilities
* - Deploy real-time tracking integrations
* - Extend collaboration to multi-agency mode
* - Expand report builder templates
* - Support custom workflow scripting or macros