Digital Delight

Phase 5 Review

December 4, 2002

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***** FOR OFFICIAL USE ONLY *****

Review Purpose and Objectives

Purpose

- To conduct a review of the activities and control products completed during the *Project Digital Delight* development effort, review final cost and schedule performance, and provide management direction for implementation and follow on activities.

Phase 5 Review Objectives

- Present **project accomplishments**
- Review **Project Closeout Report highlights**
- Identify the **project team**
- Review project **cost performance**
- Review project **schedule performance**
- Present completed **project activities/control products**
- Discuss outstanding **issues** and **lessons learned**
- Obtain **authorization** to close the project

Project Accomplishments

- **Goal**
  - This project successfully accomplished the goal of developing and deploying interim-CALEA access, intercept, and collection capabilities.
- **Project Objectives**
  - Develop engineering prototype systems to support immediate and evolving case requirements
  - Implement engineering production systems to support continuing requirements for pre- and interim-CALEA collection
  - Provide support and maintenance of both the engineering prototype and engineering production systems
  - Provide liaison with federal, state, and local law enforcement, switch vendors, service providers, and commercial collection system developers.

Project Accomplishments (cont.)

- **Project Approach**
  - Design, develop, and deploy prototype systems to respond to immediate collection needs:
    - » Work with technically-trained field agents
    - » Work with switch manufacturers
    - » Work with telecommunications service providers.
  - Enhance prototype systems designs to offer a robust and mature interim-CALEA collection platform.

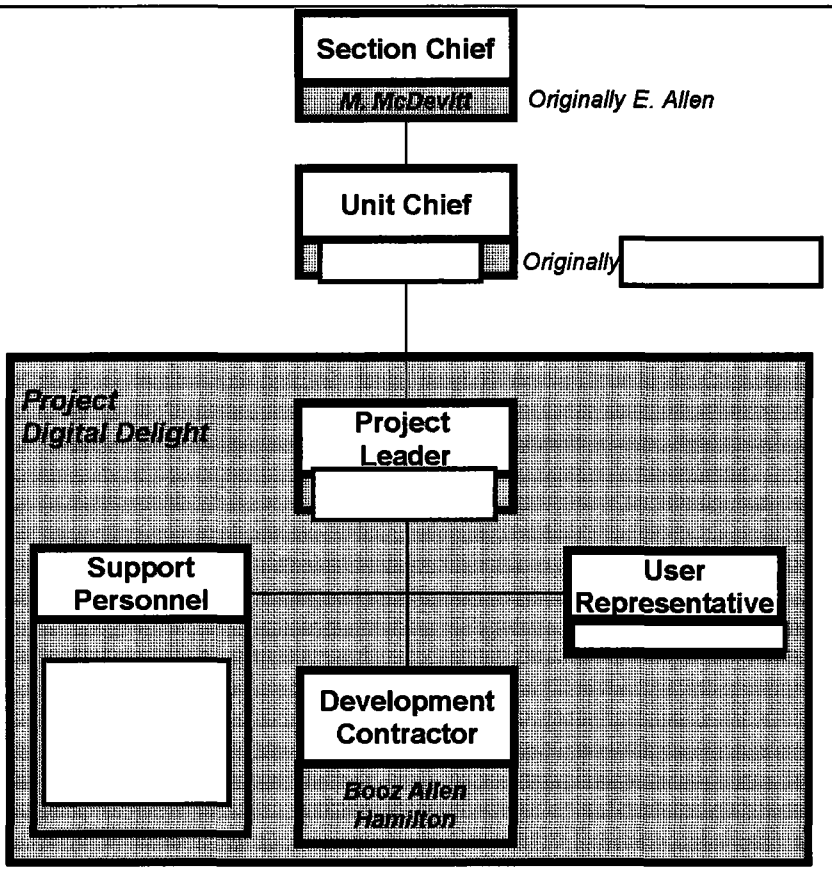
Project Accomplishments (cont.)

- **Technical Performance:**
  - **DCS-3000 system is a suite of access, intercept, collection, and management software and hardware for pen-register/trap-trace, Title III, and Title 50 applications.**
  - **DCS-3000 system architecture is based on client/server technology:**
    - » **IBM PC compatible computer systems**
    - » **Microsoft Windows NT/2000 operating system compatible**
    - » **IP networking and internetworking**
- **Operational Performance (as of December 2002):**
  - Deployed in 55 FBI field divisions and numerous resident agencies
  - Used to conduct ALL FBI wireless telephone intercepts and an increasing number of wireline intercepts
  - Used by more than 60 federal, state, and local law enforcement agencies
  - Used by CIS to test and validate Motorola's iDEN CALEA solution in March 2001

Project Closeout Report Summary

- **Project Management was executed as planned except as noted below:**
  - At the completion of the originally planned period of performance (12/31/98), CALEA implementation was still in process and vendor solutions had not been completed; and, additional interim prototype collection capabilities were needed to continue to support field operations. As such, funding levels and the project period were extended.

- **All Project Objectives were accomplished except as noted below:**
  - None.



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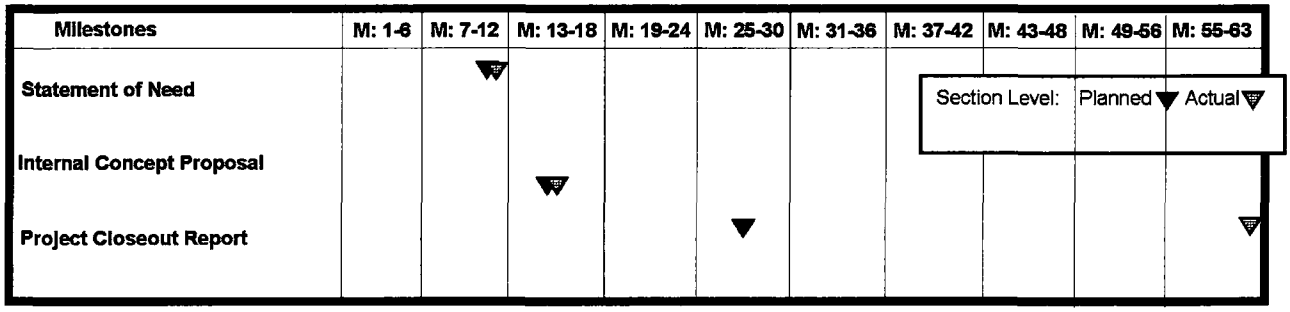
Development Cost Performance

- **Total Planned Project Cost was: $1,500,000**
- **Actual Cost-at-Completion: $3,792,098**
- **Variance ($): $2,292,098**
- **Variance (%): 152%**

The variation between the original planned cost and actual cost-at-completion is due to the change in implementation time-frame for CALEA and the lack of commercially available collection systems for CALEA-based intercepts.

Schedule Performance

- **Period of performance:** **Planned**: 6/97 to 12/98 **Actual**: 6/97 to 9/02
  - **Schedule Variance of 250%**
    Actual **63** months vs Planned **18** months variance was due to delays and uncertainties surrounding the CALEA solutions and the lack of available commercial systems for CALEA-based intercepts.



Project Closeout Report
(Phase 5 Review)

Project Activities Summary

- **Completed Planned Phase 1 and 2 Documentation and Briefings**
  - Statement of Need (SON) — Date Completed: 1/28/97
  - Internal Concept Proposal — Date Completed: 5/15/97
  - Technical Requirements Specification — Date Completed: None
  - System Requirements Review Briefing — Date Completed: None
  - SRR Report — Date Completed: None
  - Phase 2 Review — Date Completed: 6/13/97

Project Activities Summary

- **Planned Phase 3 Control Products and Unit Level Reviews**
  - Functional Description (FD) Date Completed: None
  - System Development Plan (SDP) Date Completed: None
  - System Design Description (SDD) Date Completed: None
  - Preliminary Design Review and Report (PDR-R) Date Completed: None
  - Critical Design Review and Report (CDR-R) Date Completed: None
  - Acceptance Test Plan and Procedures (TP and TPr) Date Completed: None
  - Test Readiness Review and Report (TRR-R) Date Completed: None
  - Phase 3 Review and Report Date Completed: None
- **Planned Phase 4 Control Products and Unit Level Reviews**
  - Acceptance Test Report (TR) Date Completed: None
  - Technical Manual (TM) Date Completed: June 2001
  - Training Plan (TrP) Date Completed: June 2001
  - Installation Plan (IP) Date Completed: None
  - Operational Readiness Review and Report (TRR-R) Date Completed: None
  - Phase 4 Review and Report Date Completed: None

Project Activities Summary

- **Points Of Contact**
  - FBI Technical Point of Contact
  - Developer Point of Contact

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Lessons Learned

- **Lesson 1. LINUX vs. Microsoft**
  - Limited COTS products and system drivers were available for the LINUX operating system
  - End users are not familiar with the LINUX operating system

- **Lesson 2. Commercial vs. Custom**
  - Commercial collection systems lag behind changes in electronic surveillance features for new switch software releases
  - Law enforcement needs to maintain an awareness of upcoming switch software releases and surveillance features
  - DCS-3000 system provides law enforcement with an excellent platform for quickly addressing new surveillance features.

Lessons Learned

- **Lesson 3. Liaison**
  - Liaison activities with telecommunications carriers and equipment manufacturers are important in anticipating changes in the format and delivery of CALEA and CALEA-like information.
  - Regional training for FBI personnel and liaison with telecommunications companies are extremely important to the continued success of the FBI's electronic surveillance mission.

Recap

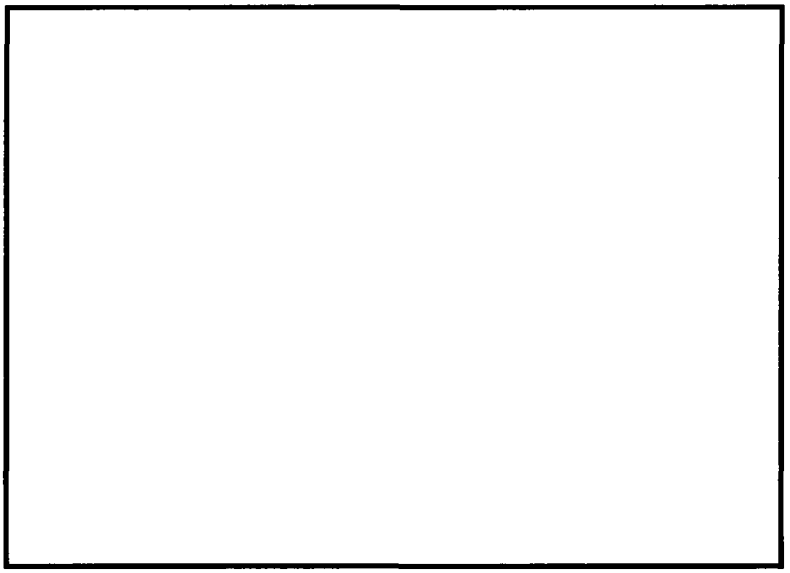
- **Presented an overview of the project accomplishments**
  - Concurrence ☐
- **Presented an overview of the Project Closeout Report**
  - Concurrence ☐
- **Reviewed Project activities, control products and technical documents**
  - Concurrence ☐
- **Reviewed Lessons Learned**
  - Concurrence ☐
- **Authorized Closeout of the project**
  - Authorized ☐

Project Digital Delight

- Initiated in January 1997 to develop CALEA-interim ELSUR capabilities for newly-deployed PCS and ESMR networks
- Developed DCS-3000 - a new intercept/collection system for new PCS switches (primarily PCS-1900/GSM switches)

Project Digital Delight

- DCS-3000 is currently deployed in 16 FBI field offices covering:



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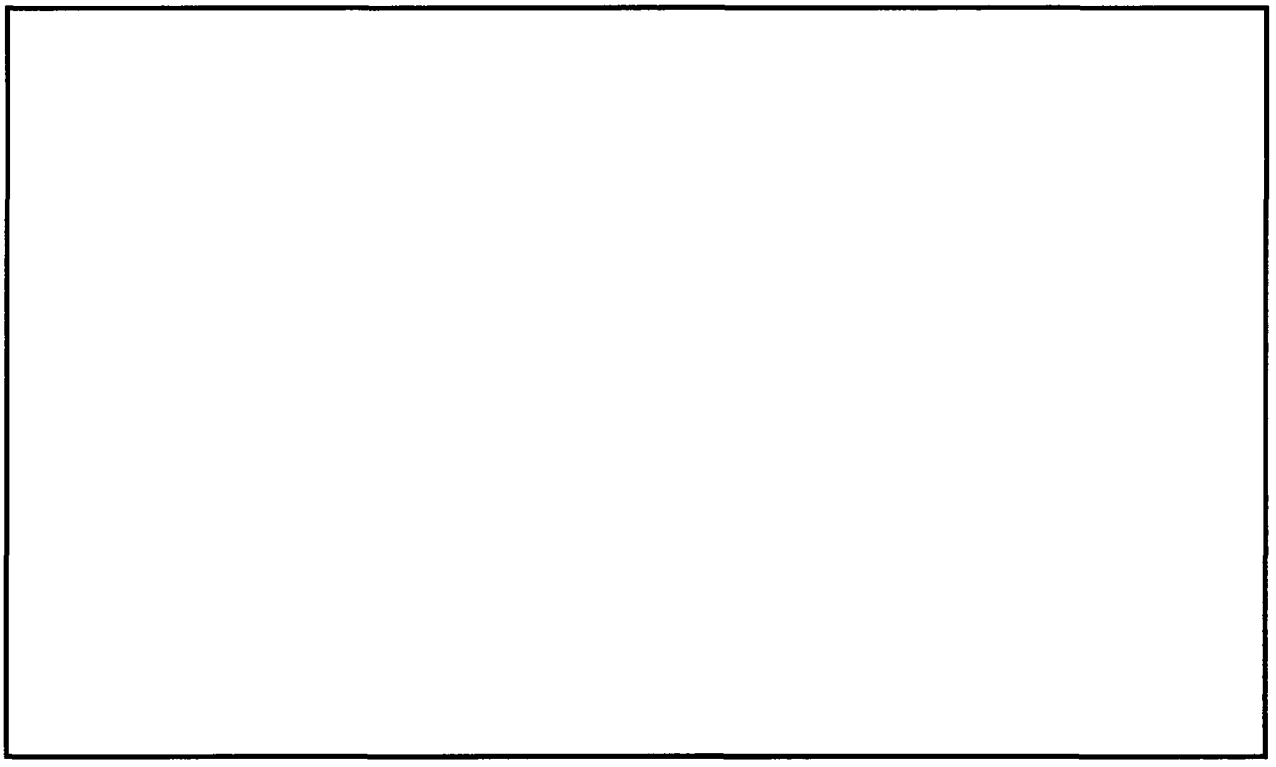
DCS-3000 System Architecture



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[redacted] Intercept Capabilities

- [redacted] DMS-100/GSM switch has real-time pen-register and Title-III ELSUR capabilities
  - Compatible with the DCS-3000 system
  - Currently, [redacted] only has implemented these capabilities in 2 MSCs - Atlanta, GA and White Plains, NY
  - Motorola DAP/MPS switch **does not have any** ELSUR capabilities

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United States Department of Justice
Federal Bureau of Investigation

DCS-3000 News

Telecommunications Intercept and Collection Technology Unit

October 16, 2005

Switch-Based Intercept Team

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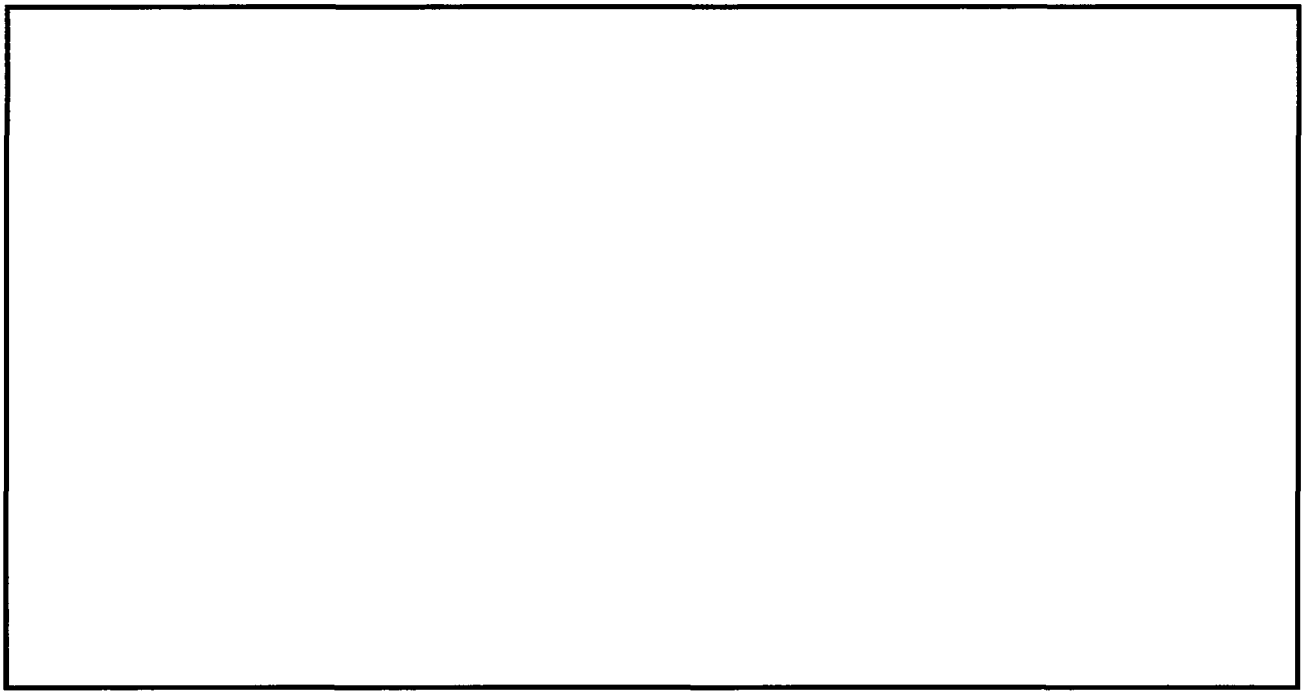

DCS-3000 News

Topics

- *DCS-3000* Numbers
- [redacted]
- PTT Intercepts
- *Valkyrie*
- *BW-3000*
- VoIP Intercepts

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DCS-3000 Numbers

- More than [redacted] intercepts supported by the DCS-3000 in FY2005

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83% Wireless
17% Landline

[redacted]

[redacted] System Architecture

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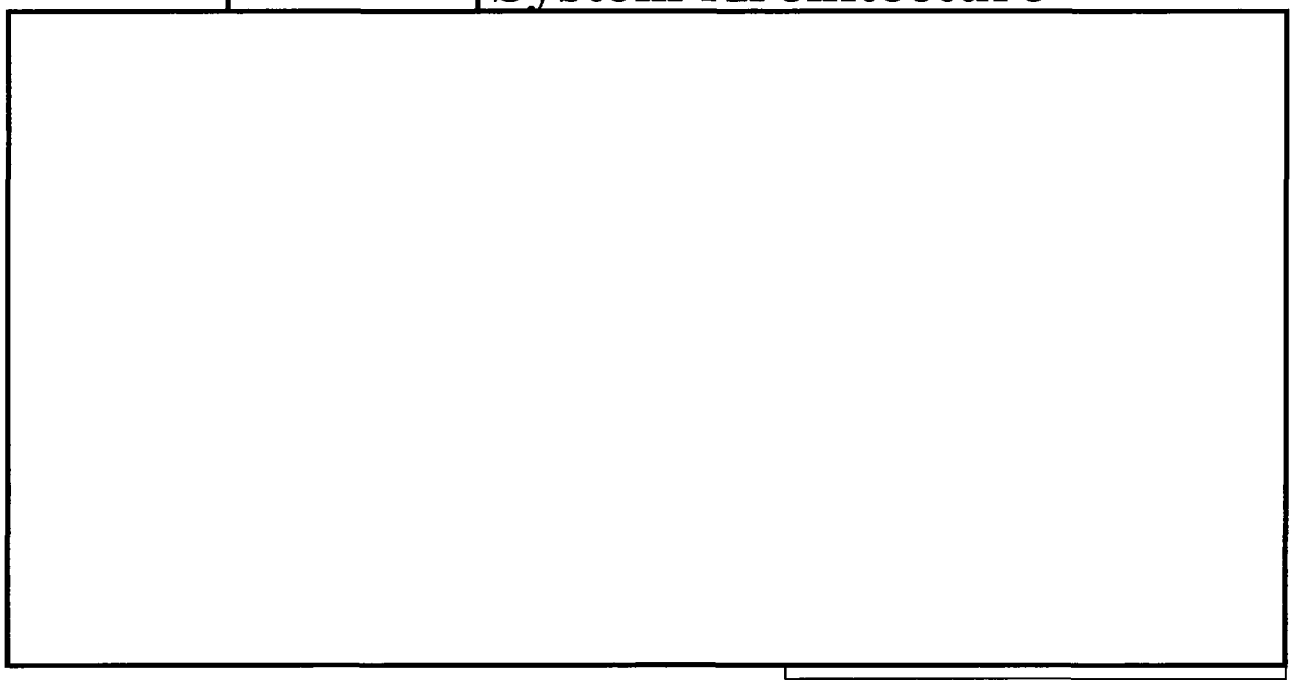

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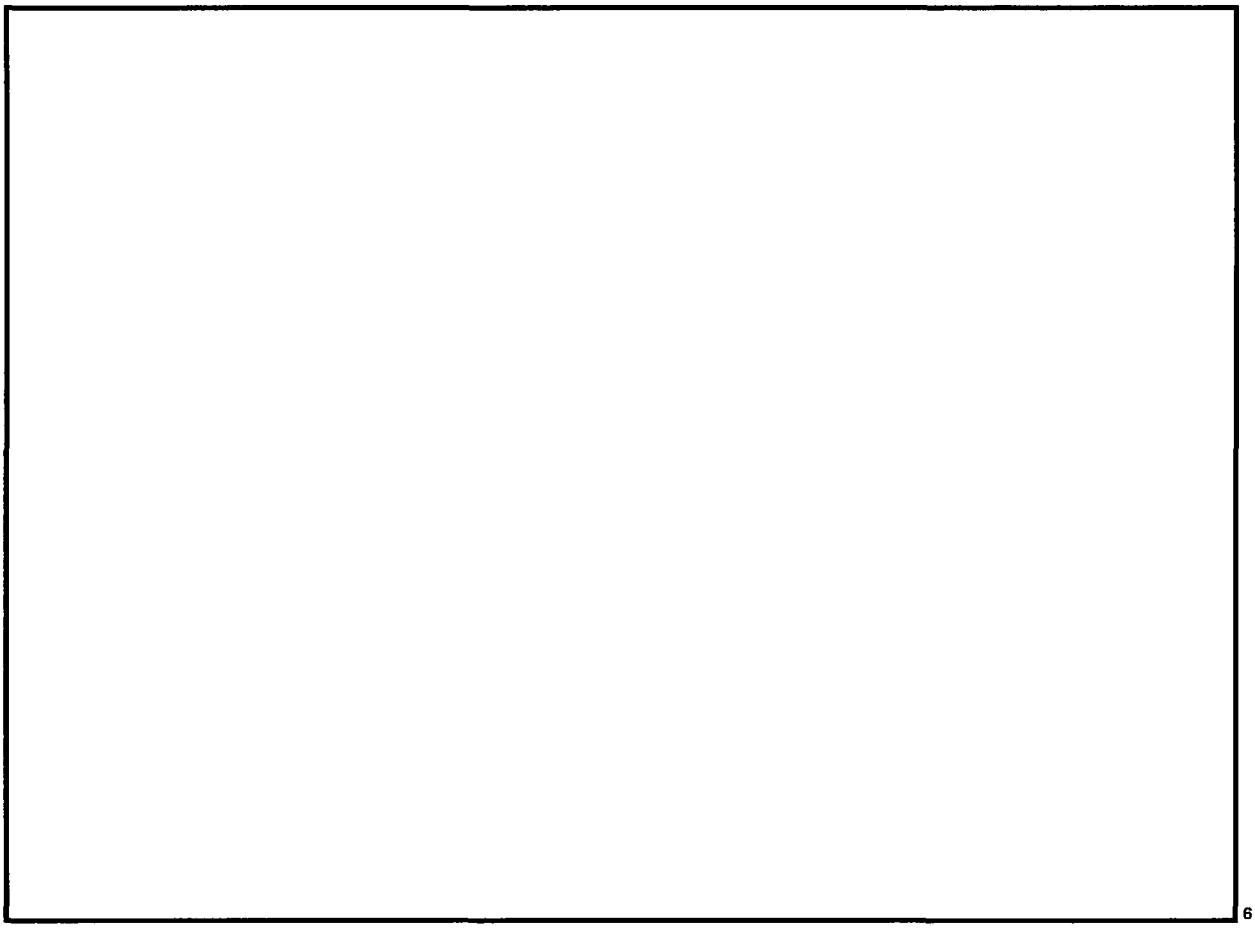

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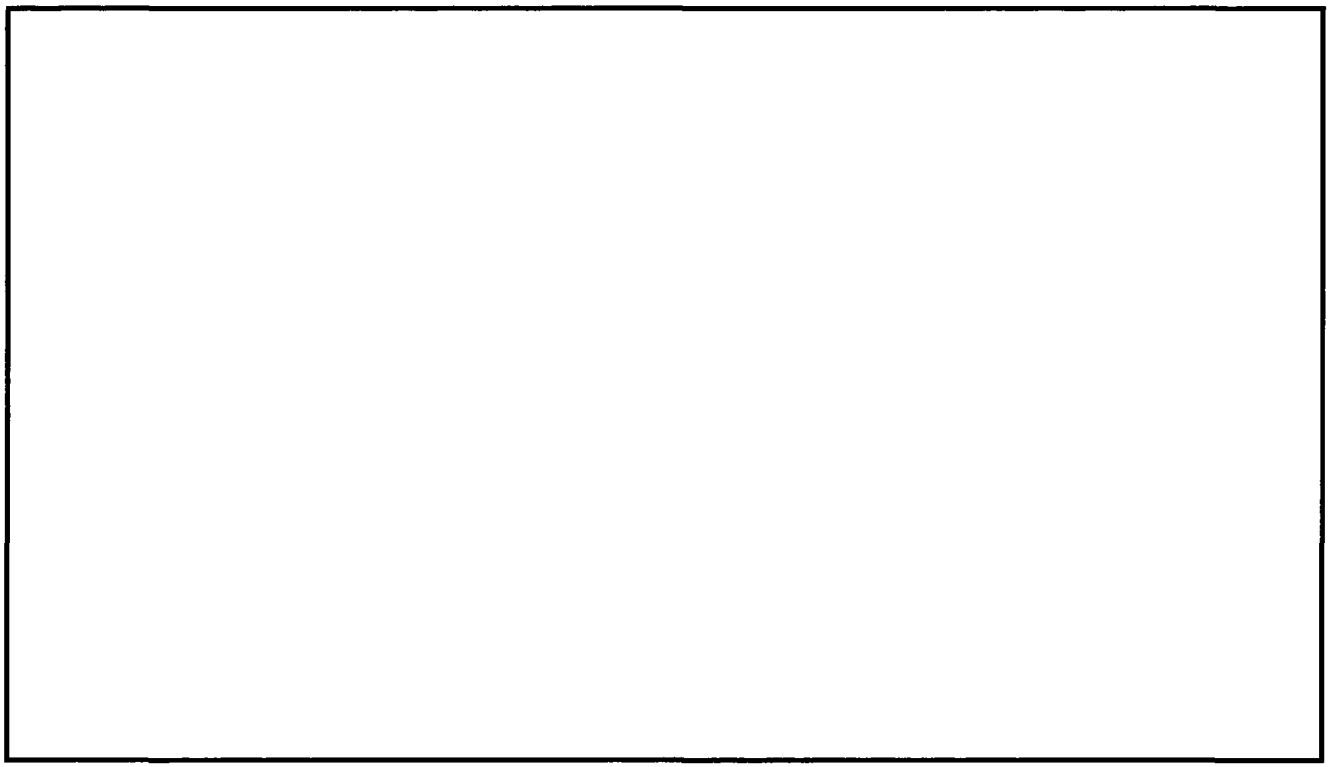
DCS-3000 News



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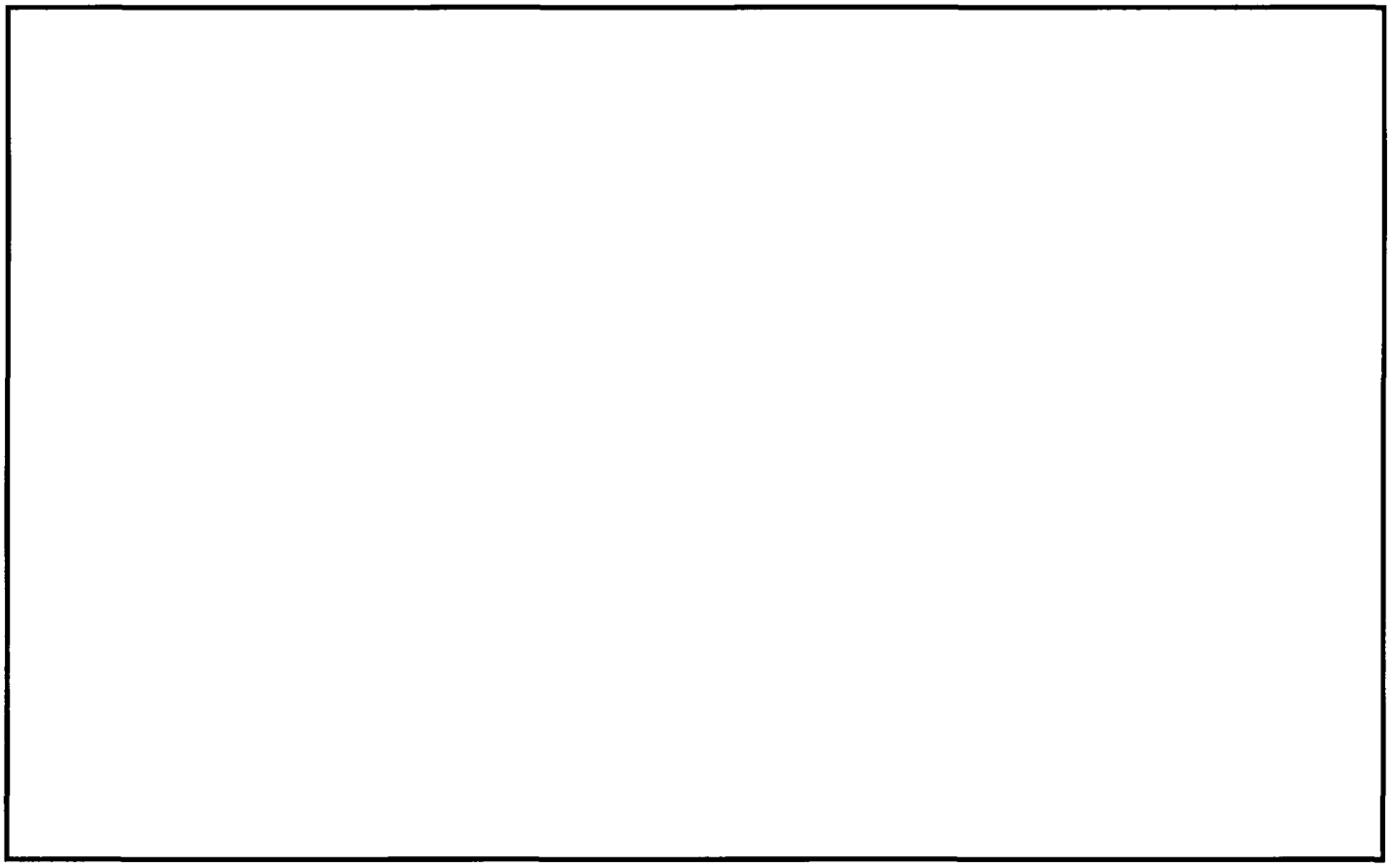
DCS-3000 News



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[redacted] PTT / [redacted] ReadyLink

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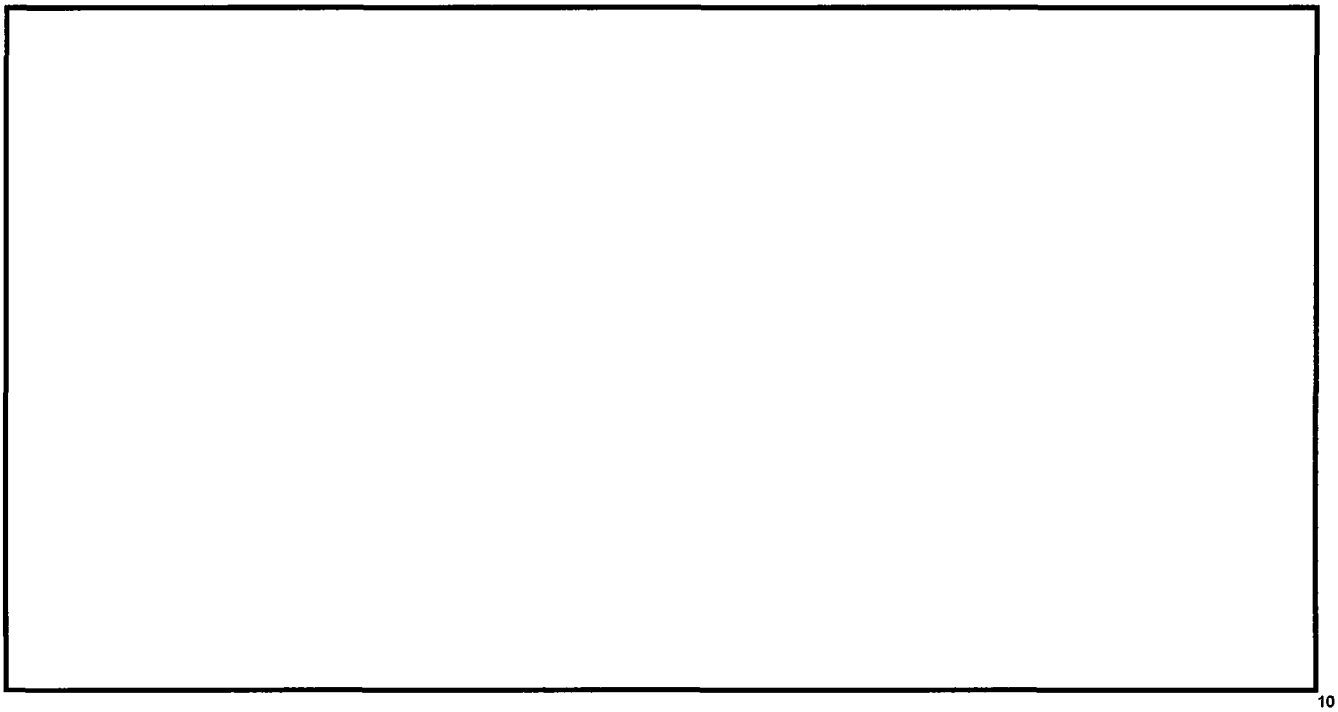
Valkyrie



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Valkyrie

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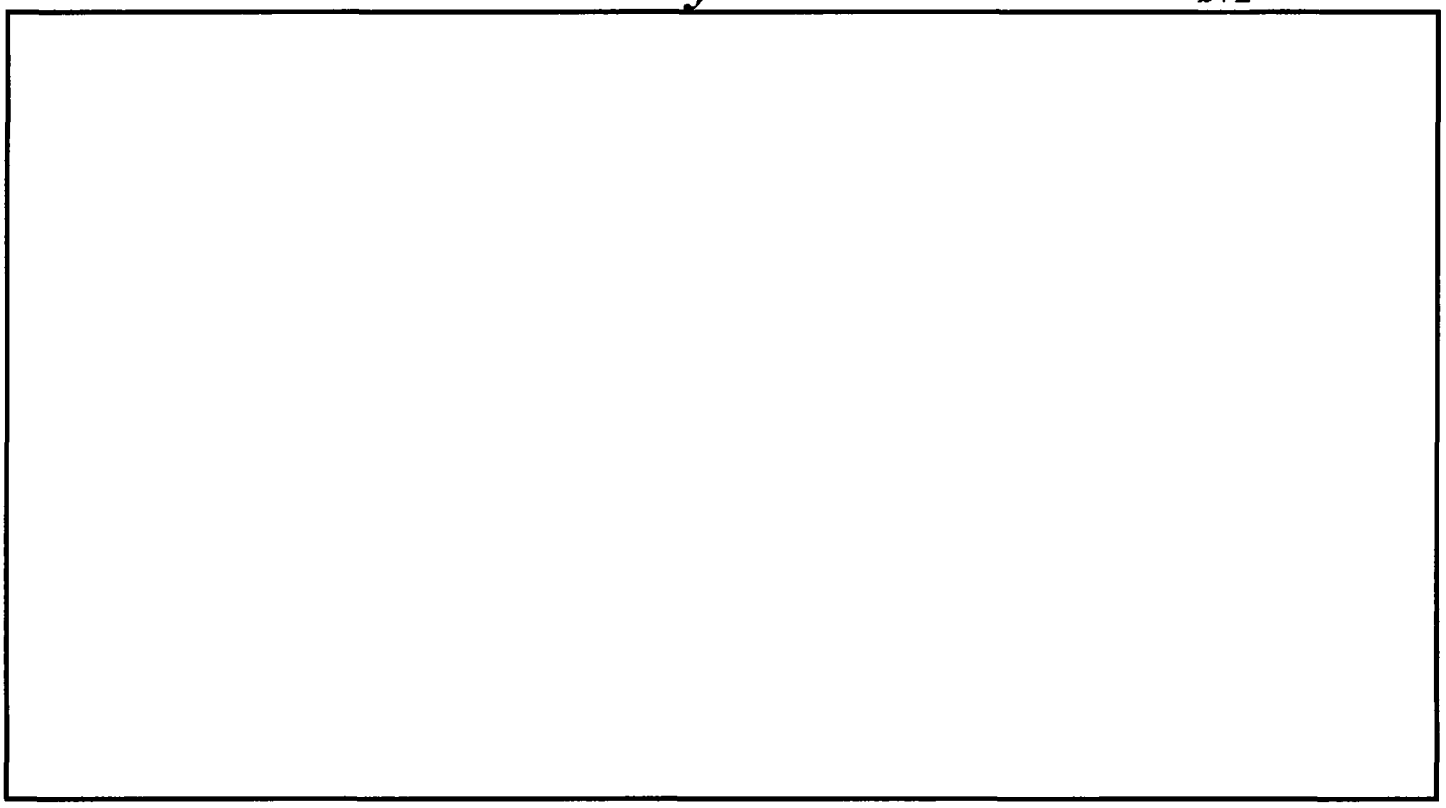

BW-3000

- Many landline carriers now deploying new GR30 intercept capability
  - [redacted] and others
  - CCC delivered via 'dial-out'
  - CDC delivered via FSK over 'dial-out'
- Initial DCS-3000 solution depended on Zoom modem
  - Zoom modem developed by ATU for switch solution verification
  - Not suited for high density collections
- SBIT developed BW-3000 for large collection sites
  - Software based FSK demodulators (up to 8 per system)
  - Seamless integration with existing collection systems

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VoIP Intercepts

- Many common carriers now deploying VoIP subscriber access technologies
- Some carriers have already embraced CALEA requirements and have intercept solutions available:
  - [redacted] b2 b7E
- The solutions deployed by these carriers have forced SBIT to develop a new access model:
  - CDC and CCC delivery via VPN over the Internet

VoIP Intercepts

- [redacted]
  - Neustar acts as technical agent
    - CDC: Cable Labs (~ J-STD-025A)
    - CCC: UDP/IP (target differentiation by MAC address)
- [redacted]
  - Verisign acts as technical agent
    - CDC: Cable Labs
    - CCC: UDP/IP (target differentiation by UDP port)
- [redacted]
  - Technical issues handled internally ✓
    - CDC: Cable Labs
    - CCC: 'Dial Out'

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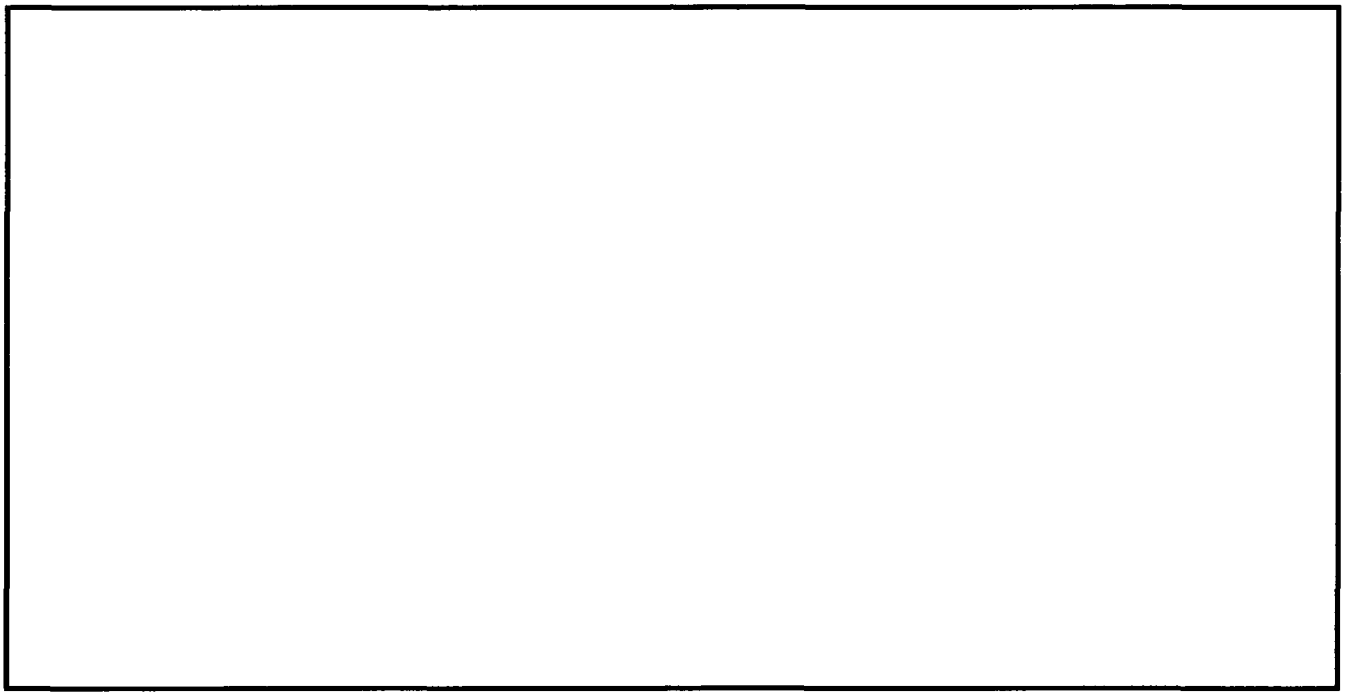
VoIP Intercepts



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Under Development

- CCC audio concentrator for DCS-3000 to RW applications
  - High density VoIP-to-Analog delivery system
  - Multiple intercepted CCCs will be packed onto T-1 circuit for RW input
    - [redacted] VSELP, AMBE++, and PCM CCCs
    - [redacted] CCCs b2 b7E
    - Landline VoIP CCCs
    - [redacted] and other VoIP PTT CCCs


Questions?

Telecommunications Interce
and Collection Technolo

Electronic Surveillance in the 21st Century

Key Elements

ACCESS

COLLECTION

ANALYSIS

Key Elements

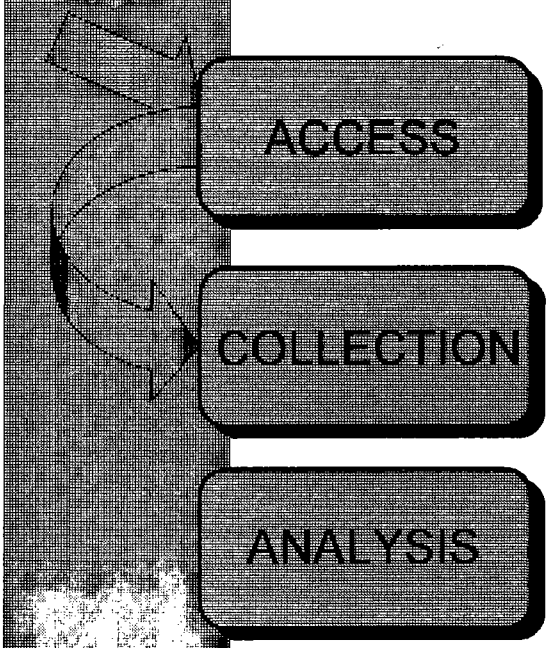
ACCESS

COLLECTION

ANALYSIS

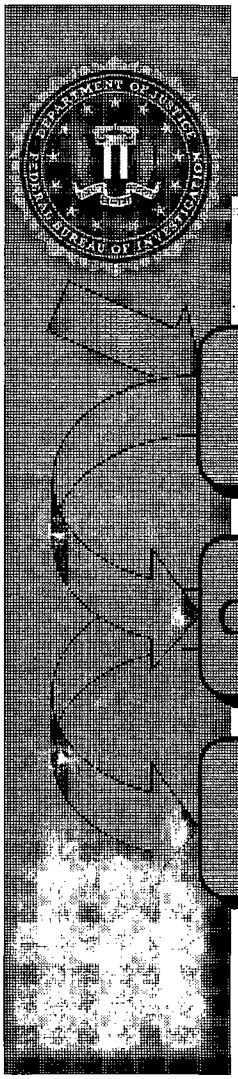
Interconnection with the switching facilities of the carrier(s) and delivery of the authorized data and/or content to the designated monitoring facility.

Key Elements



Support for real time monitoring and the organized electronic storage of call content and associated call-related data by commercial applications at field offices.

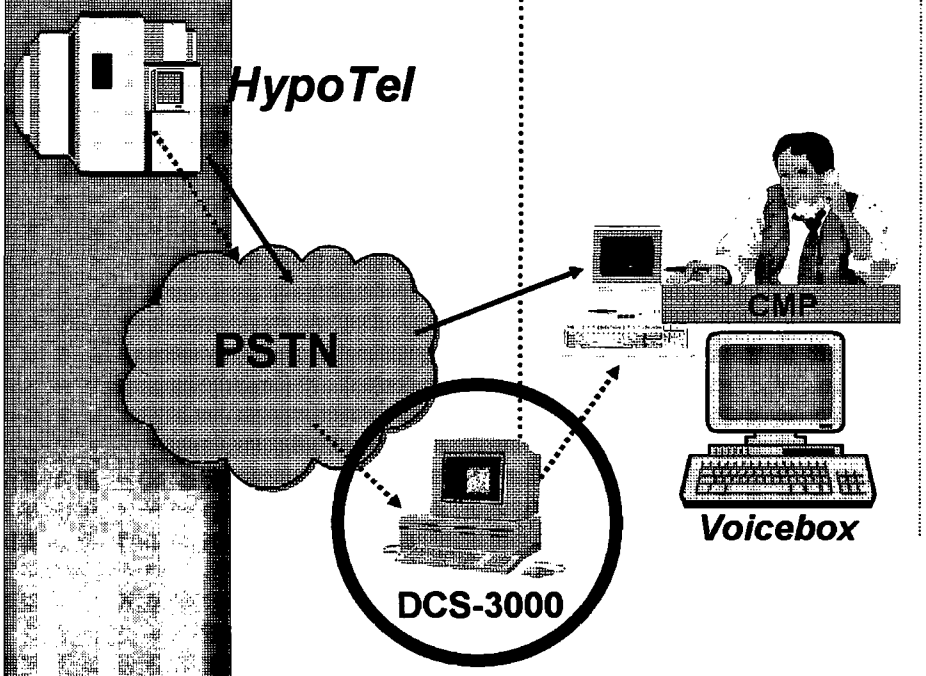
Key Elements



The application of specialized software tools, against the collected content and/or data, to identify suspects, associations, patterns and other investigative leads.

Key Elements

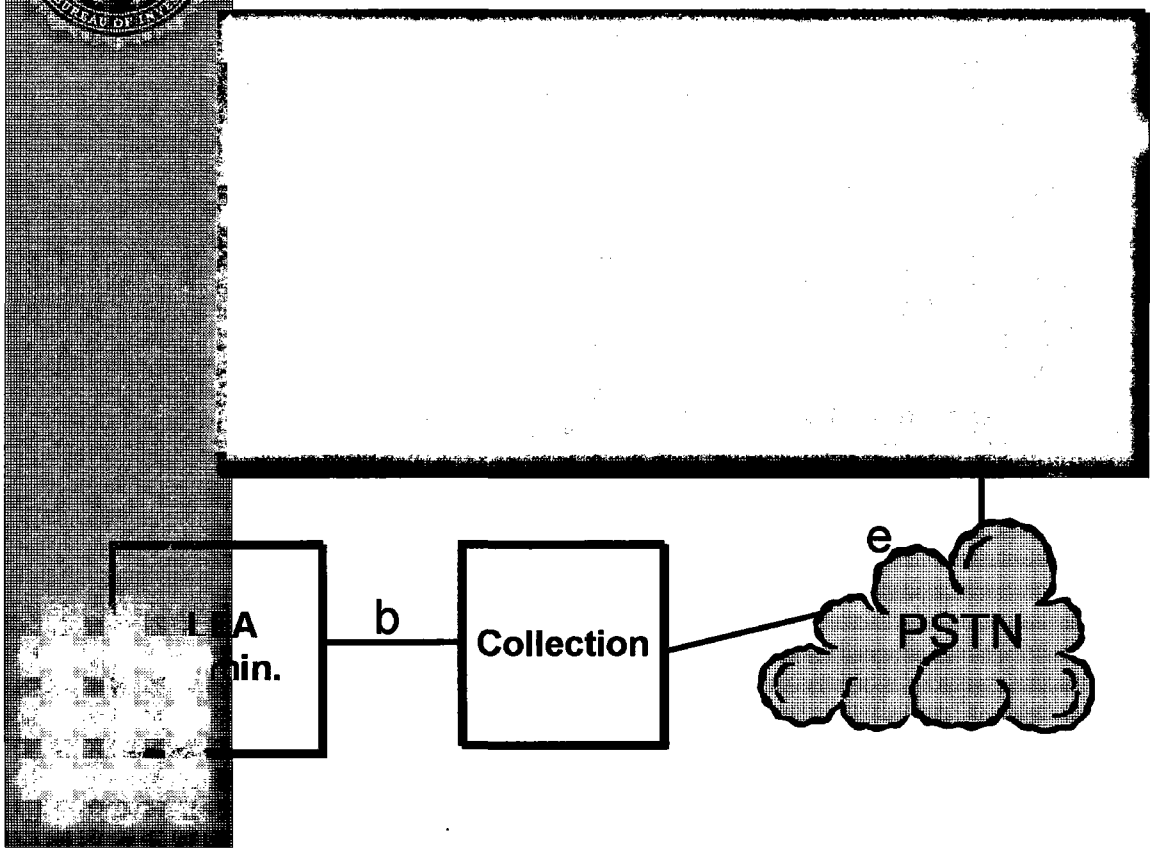
ACCESS | **COLLECTION** | **ANALYSIS**



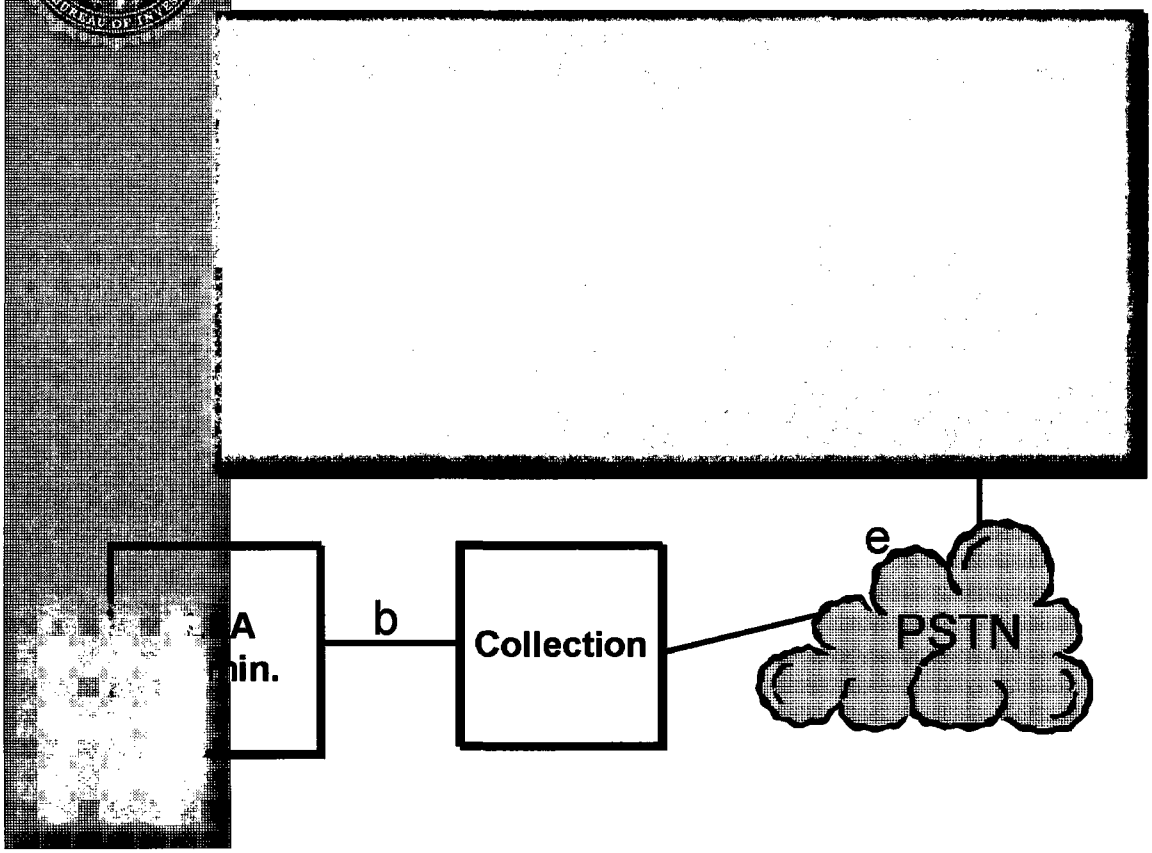
- **Link Analysis**
- **Keyword Spotting**
- **Keyword Searching**
- **Voice Recognition**
- **Voice Identification**

Access

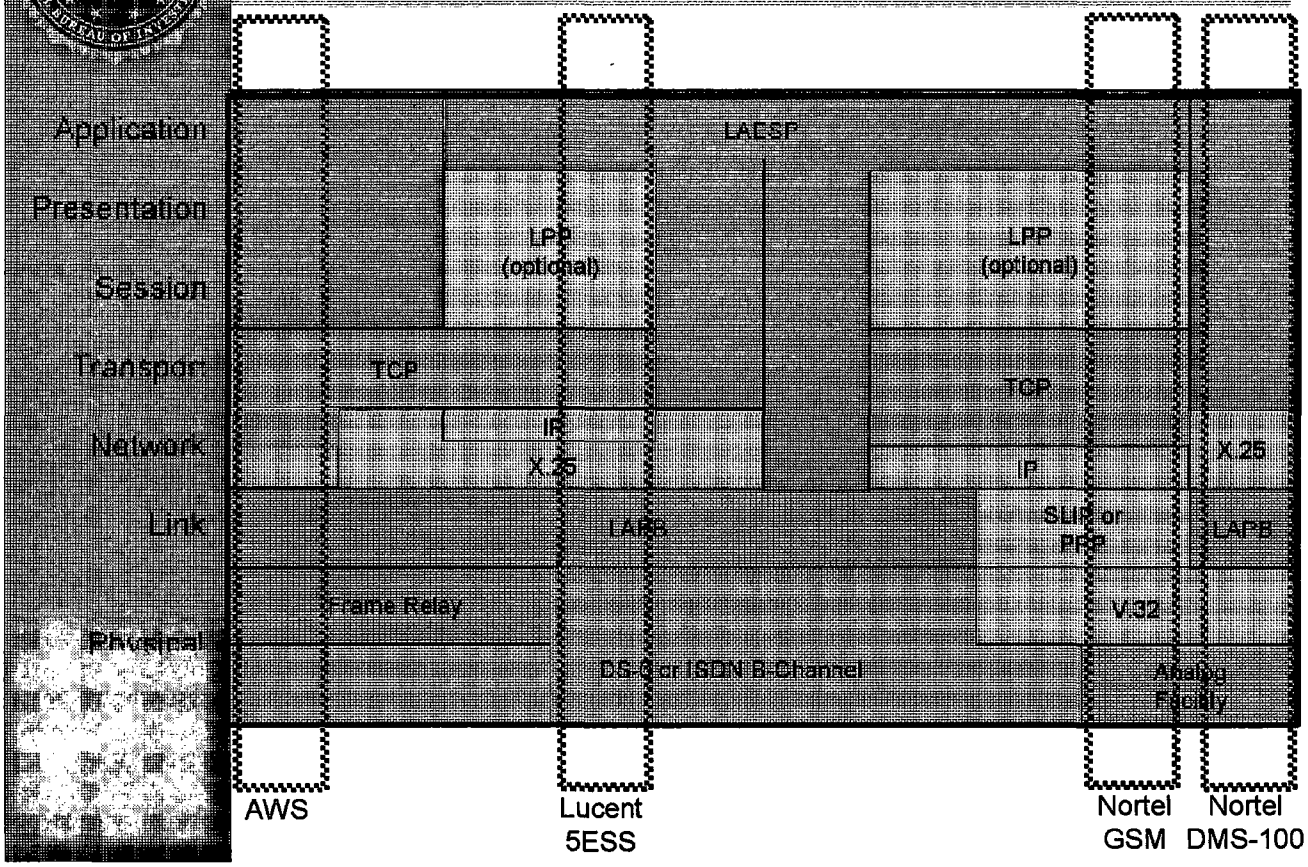
Access



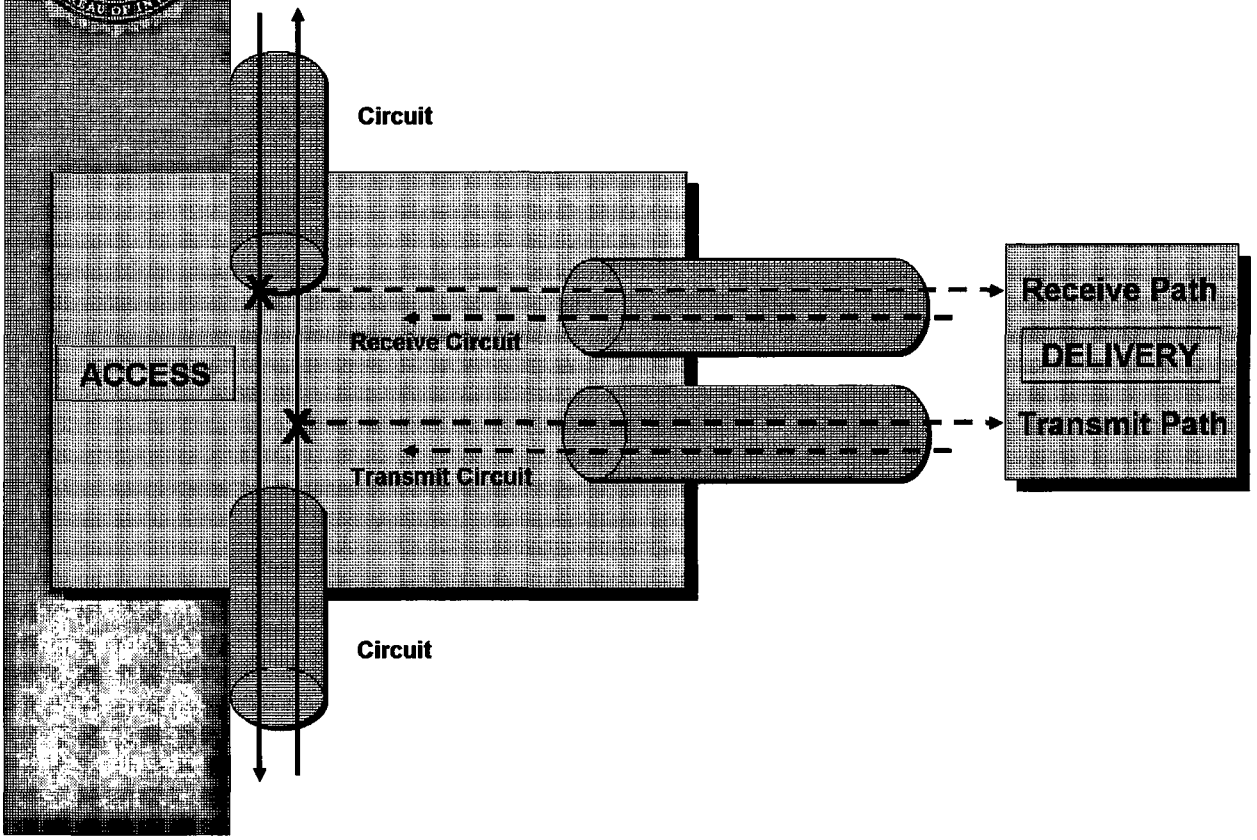
Access

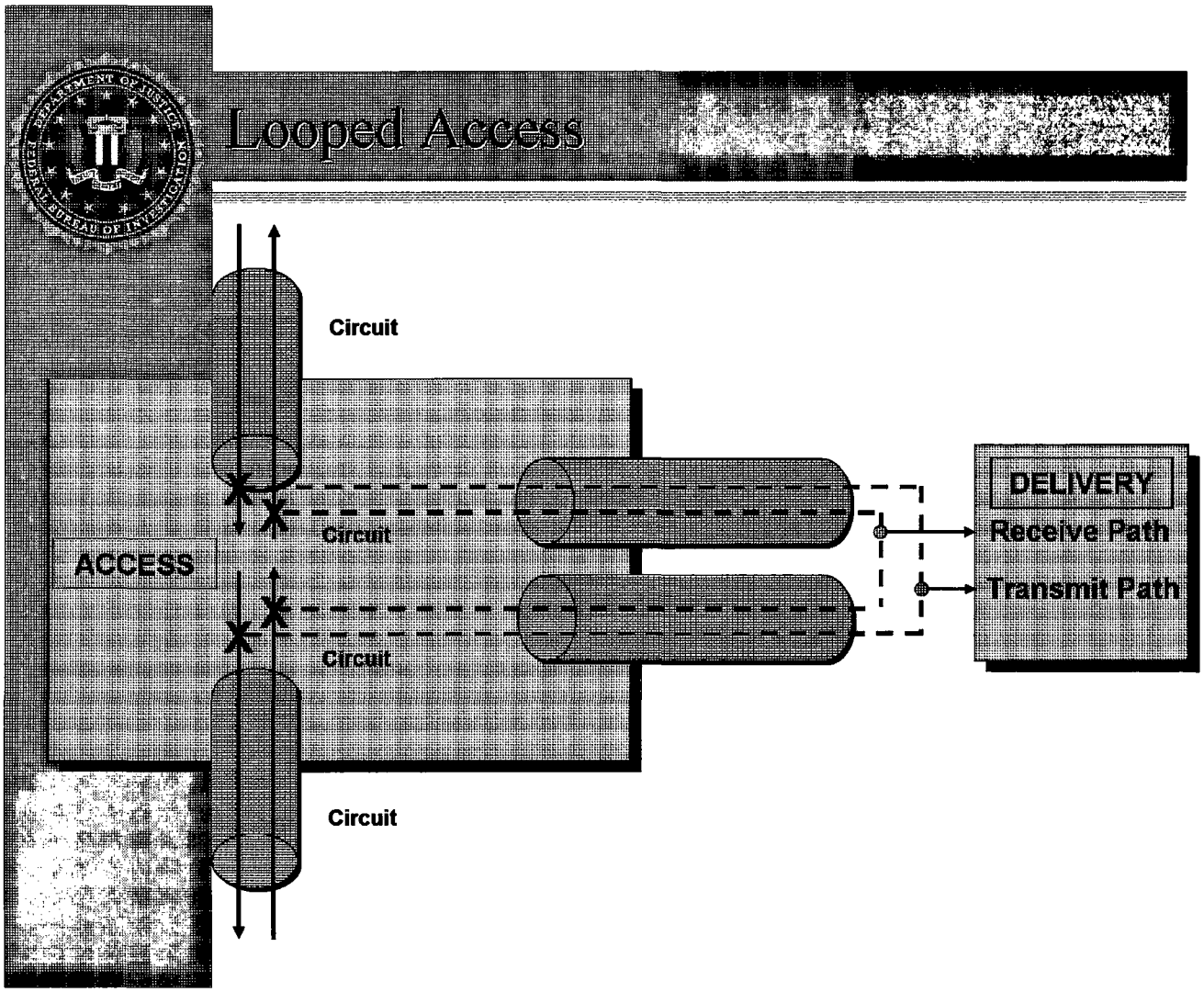


Access Models

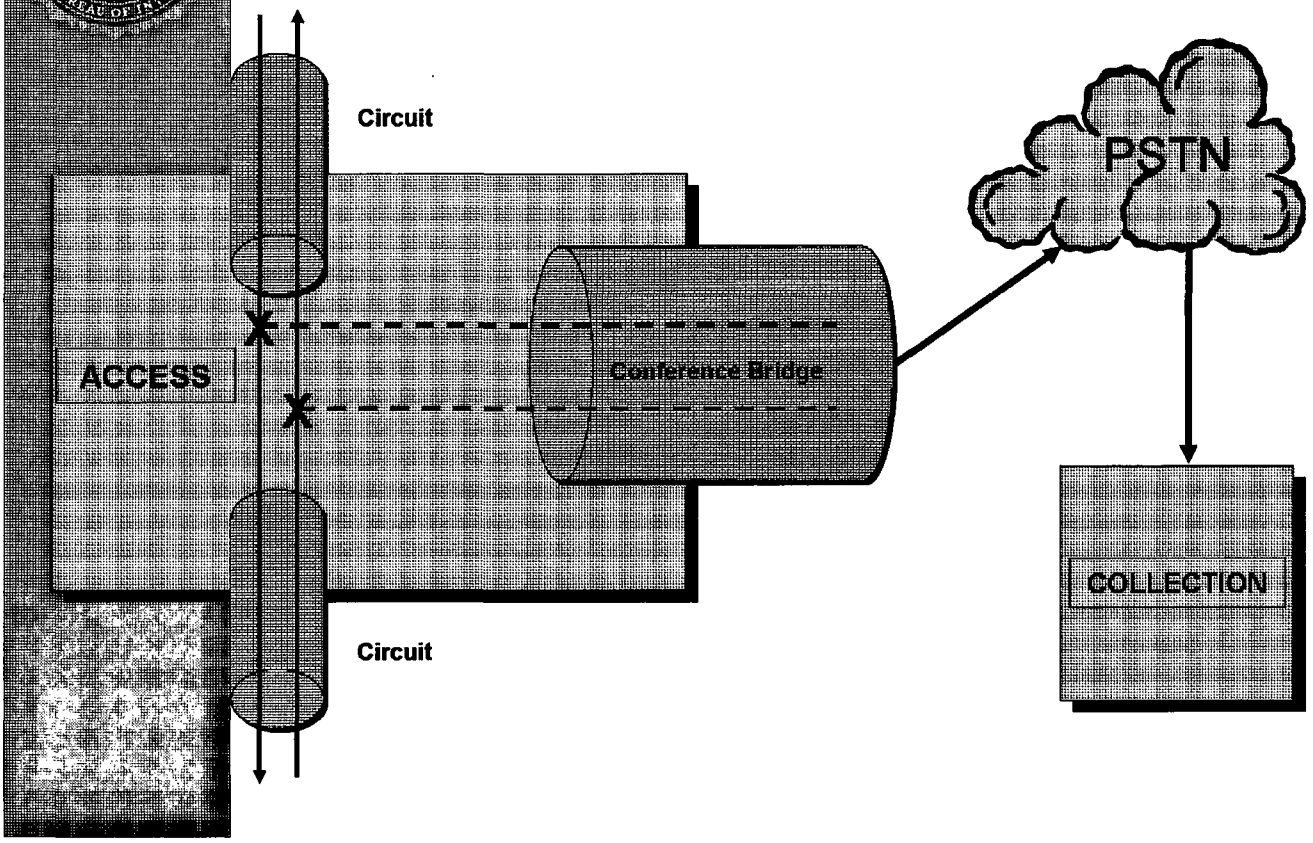


Bridged Access



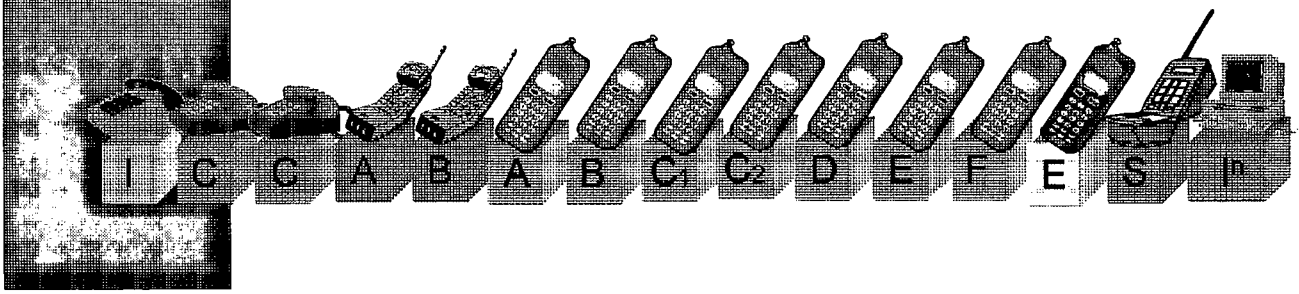

Looped Access
Circuit
Circuit
ACCESS
Circuit
Circuit
DELIVERY
Receive Path
Transmit Path

Ringdown/Dialout Access



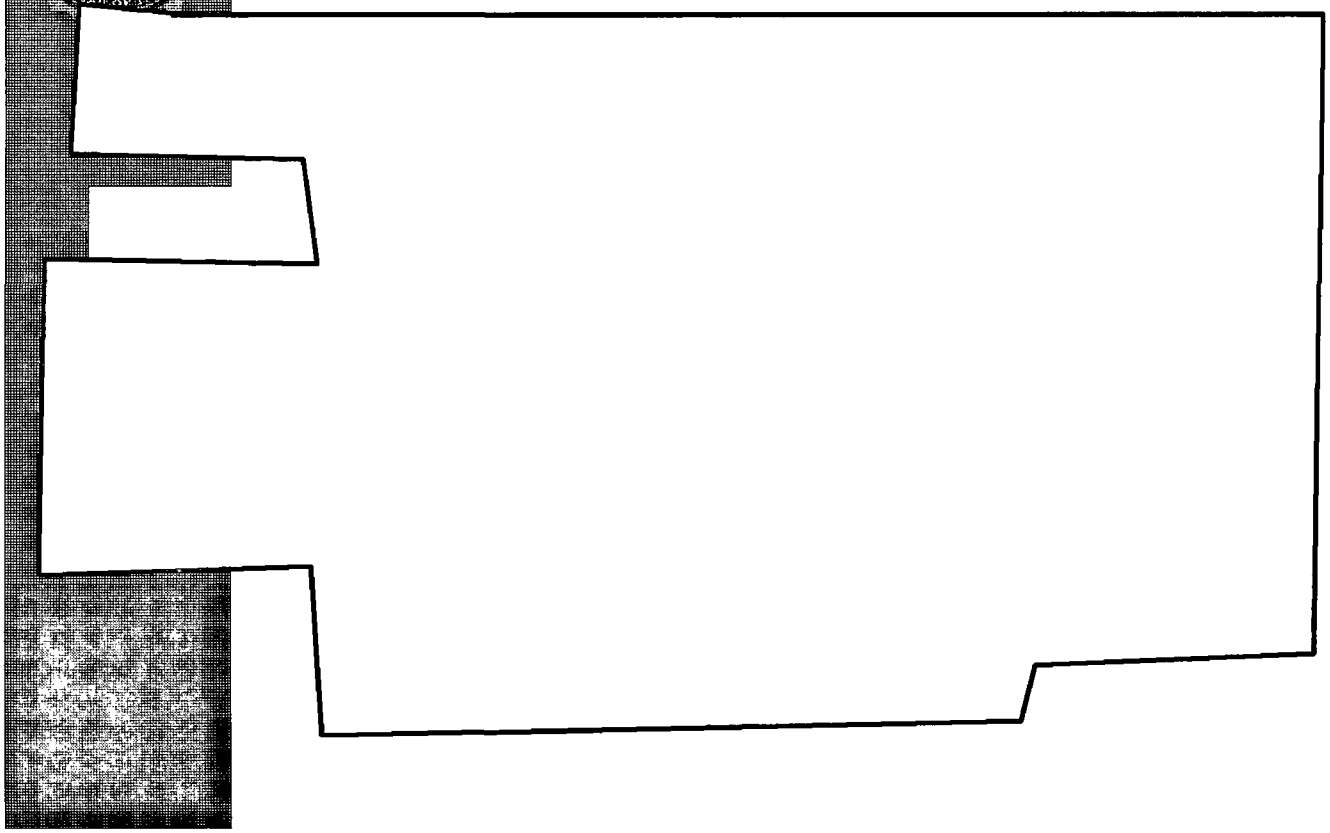
Service Provider Growth

- Incumbent Local Exchange Carrier (ILEC)
- Competitive Local Exchange Carrier (CLEC)
- Conventional Cellular
- Personal Communications Services (PCS)
- Enhanced Specialized Mobile Radio
- Satellite
- Internet Telephony (Voice over IP)



An Expanding Carrier Community

Switch Vendors



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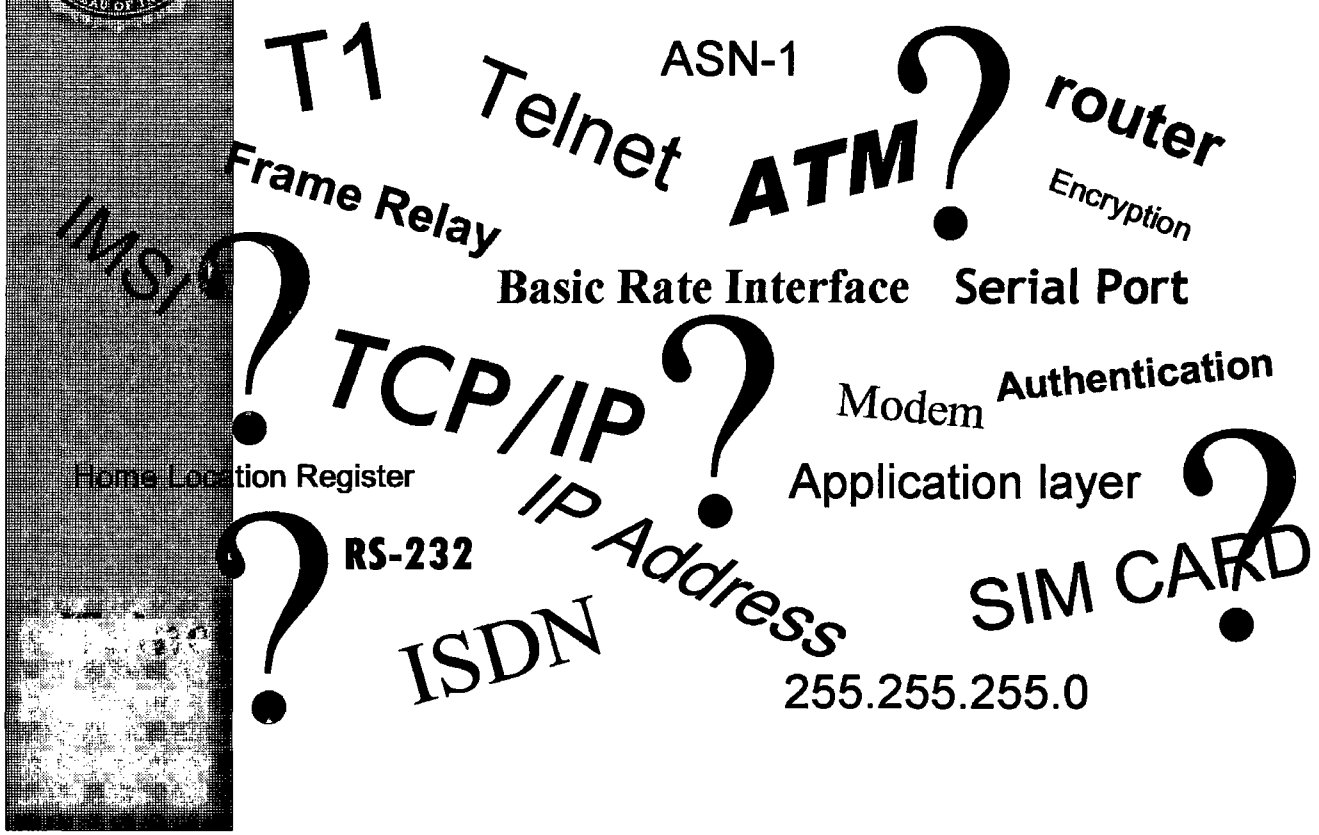
Terms, Technologies and Components



Interim PCS Solutions

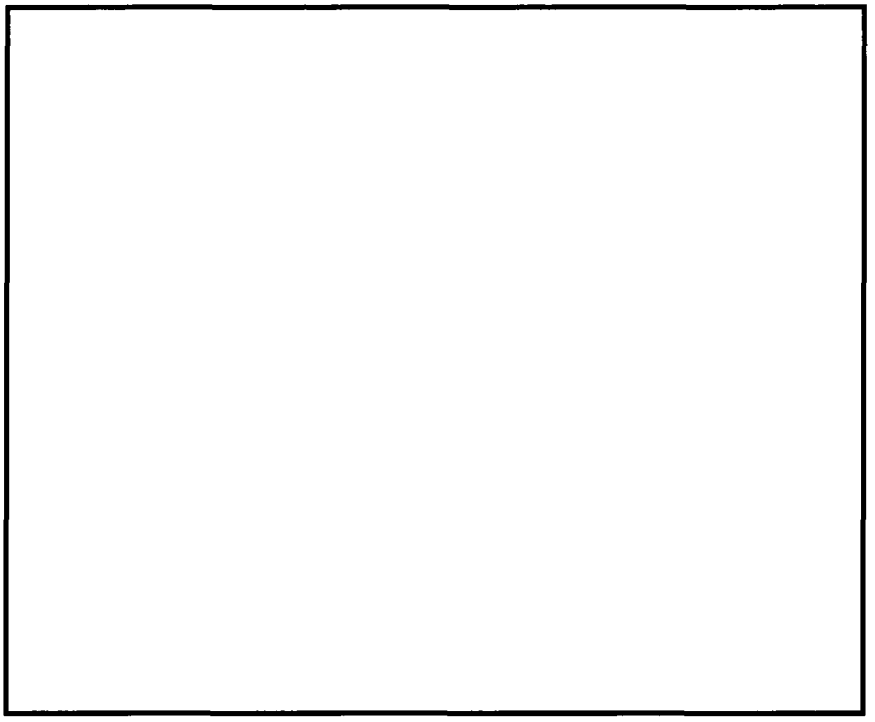
Electronic Surveillance Technology Section

Networks Access Development Unit

Topics of Discussion

- Broadband PCS
- ESMR
- Current PCS/ESMR Solutions
- DCS 3000 Demo

PCS Collection System Architecture



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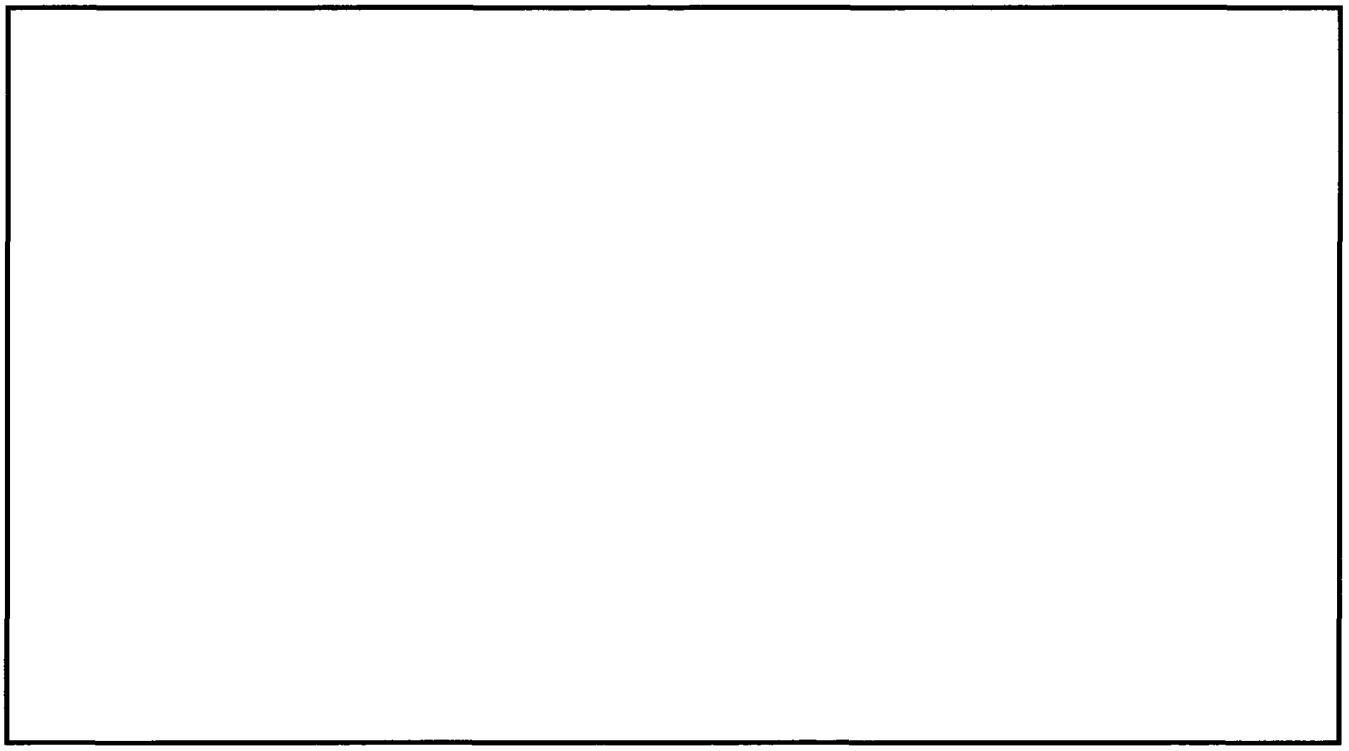
PCS Collection System Architecture



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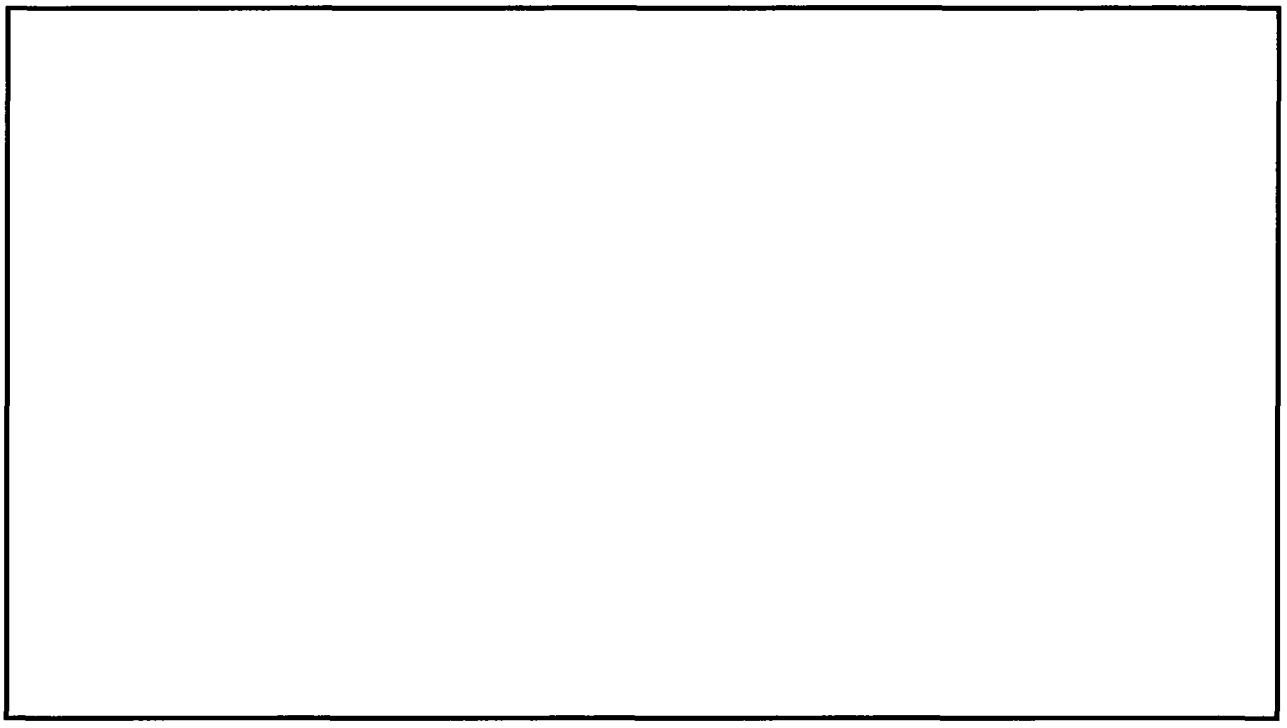
PCS Collection System Architecture



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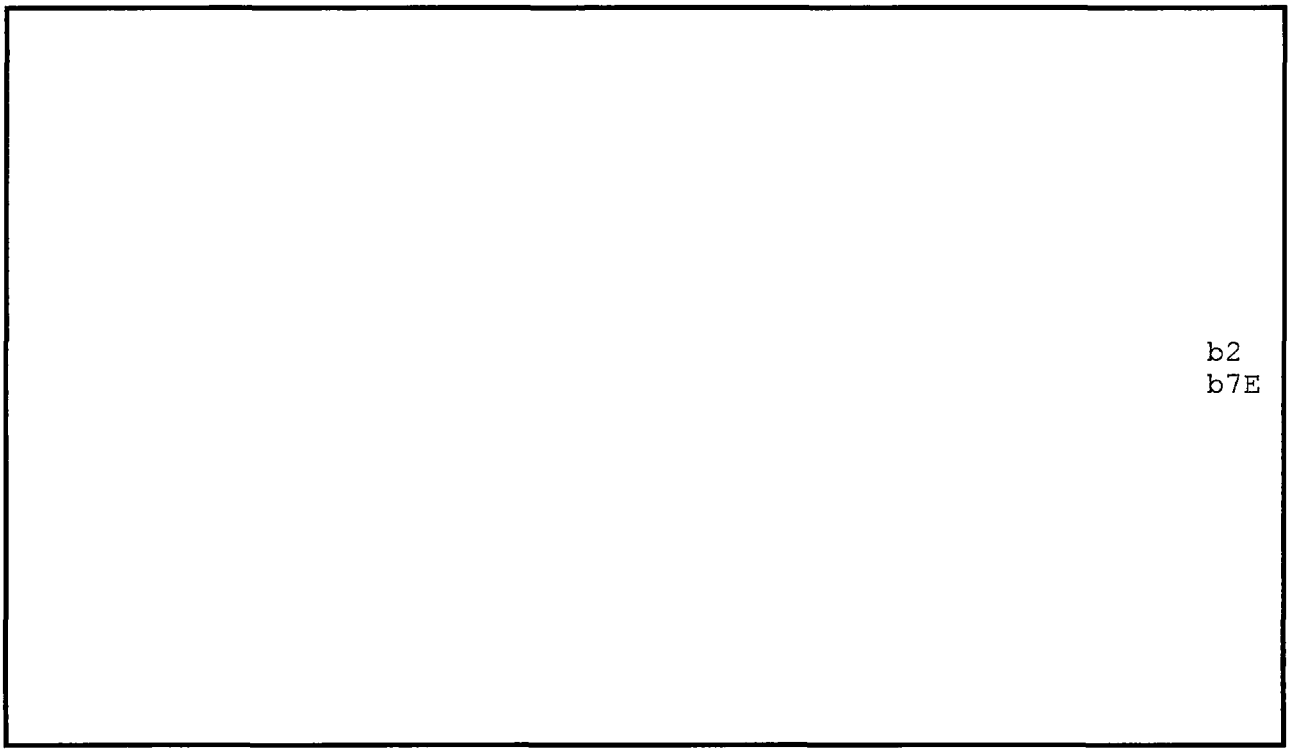
PCS Collection System Architecture



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Current Switch Capabilities

Switch	Type	Intercept Technique/Delivery	Intercept Equipment

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DCS-3000 System

- DCS-3000 is currently deployed in more than 20 FBI field offices covering:
  - [redacted] - 5 switches
  - [redacted] - 3 switches
  - [redacted] 4 switches
  - [redacted] - 2 switches
  - [redacted] - 8 switches
  - [redacted] - 2 switches
  - [redacted] 5 switches
  - [redacted] - 4 switches

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DCS-3000 System Architecture

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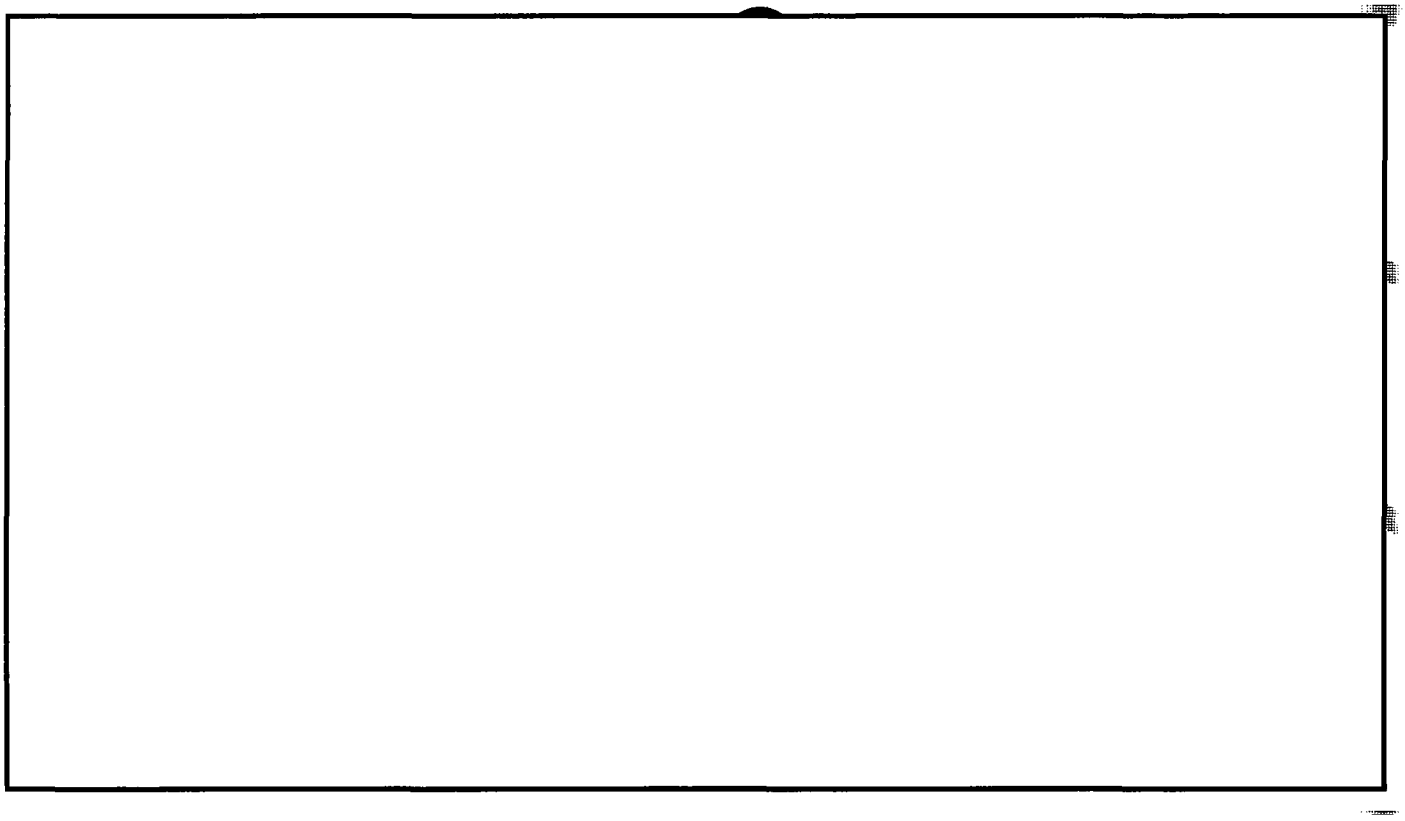

PCS Solutions

Telecommunications Access Program
EST-3

Topics of Discussion

- Broadband PCS
- [redacted]
- Current PCS/ESMR Solutions
- DCS 3000

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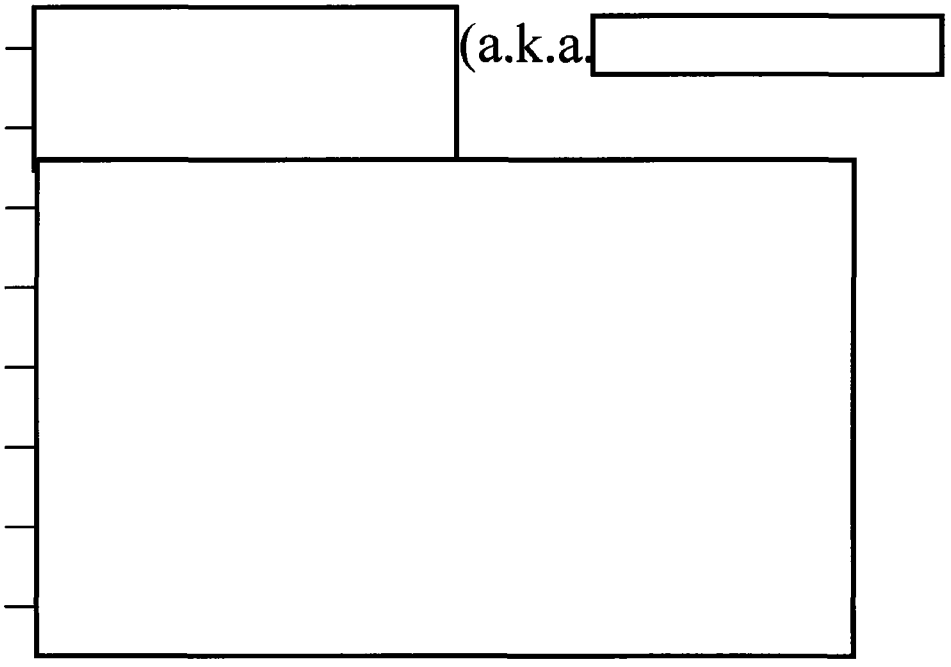
DCS-3000 System

- FBI's first CALEA-paradigm intercept/collections system
- Windows NT-based Client/Server architecture
- Originally developed for PCS/GSM switches

DCS-3000 System

- Currently deployed in more than 40 FBI field offices and 75 MSCs covering:



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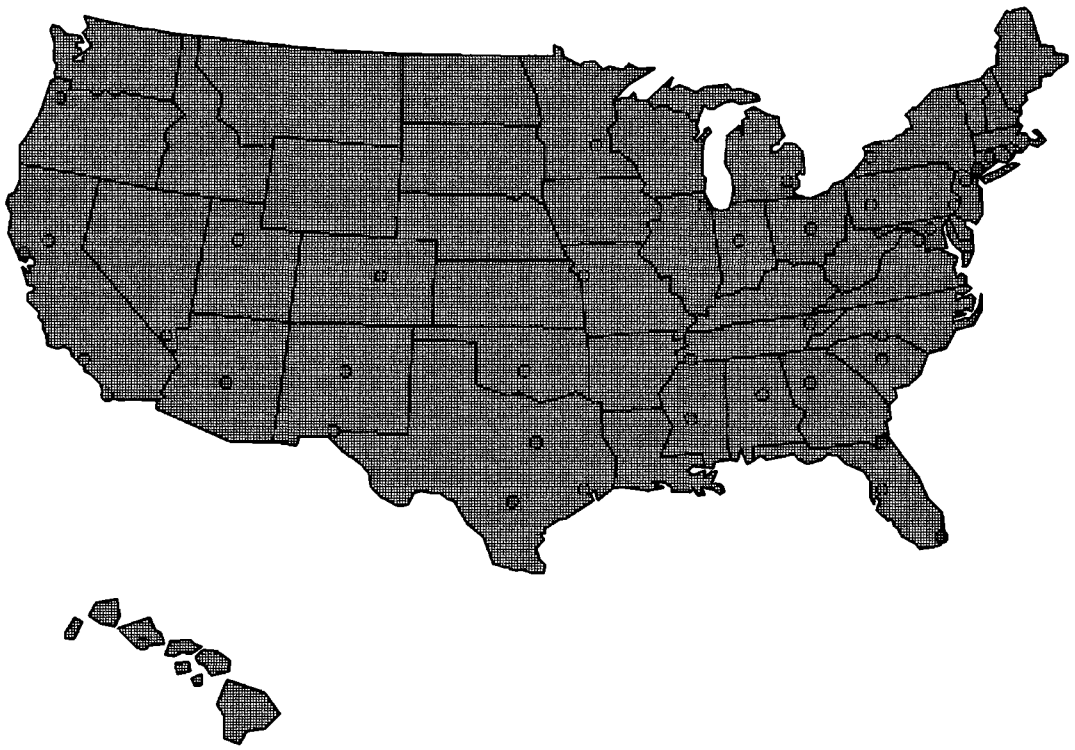
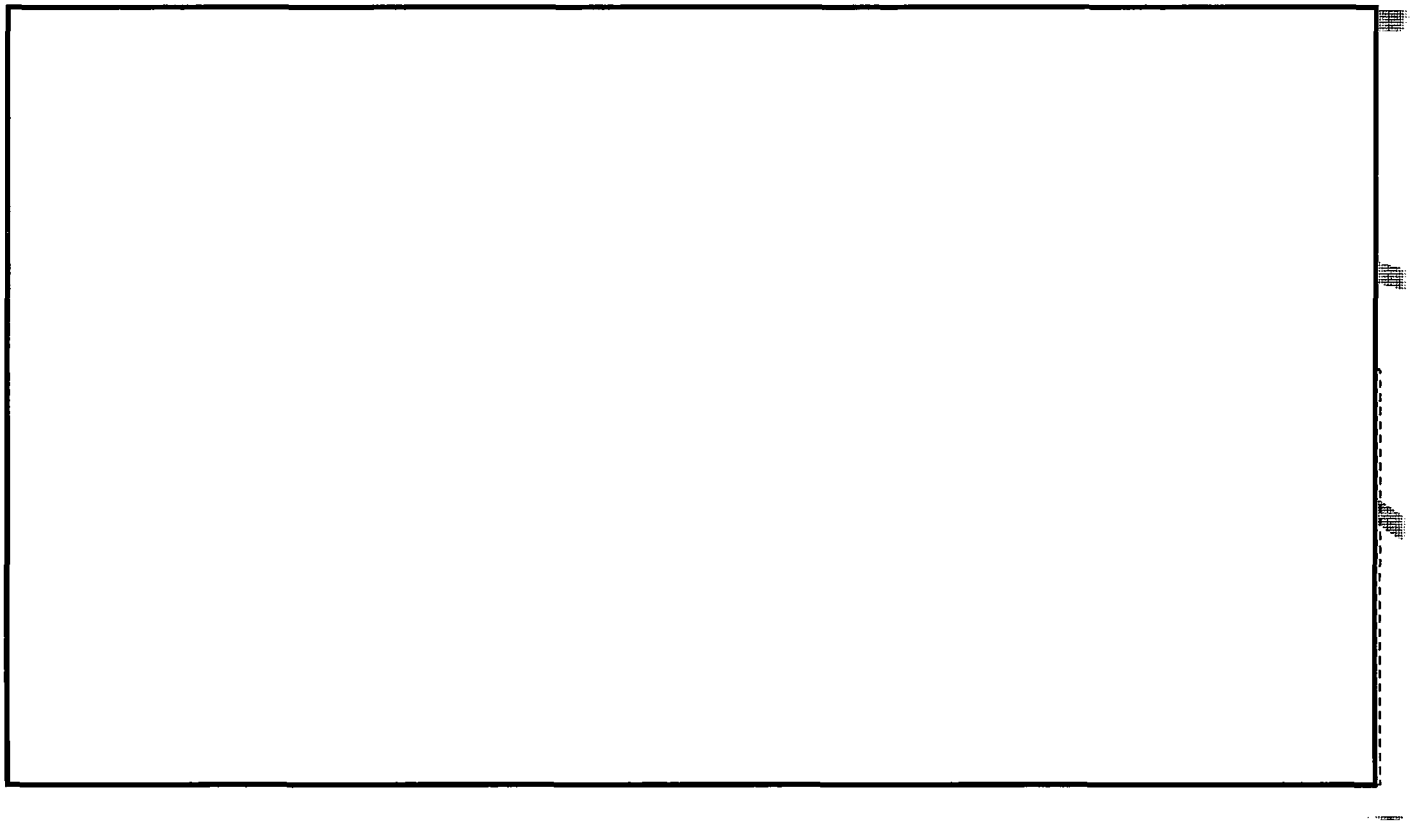
DCS-3000 Deployments



DCS-3000 Intercept/Collection System



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Interim PCS Solutions

Electronic Surveillance Technology Section

Networks Access Development Unit

Topics of Discussion

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- DCS 3000 Demo

Current Switch Capabilities

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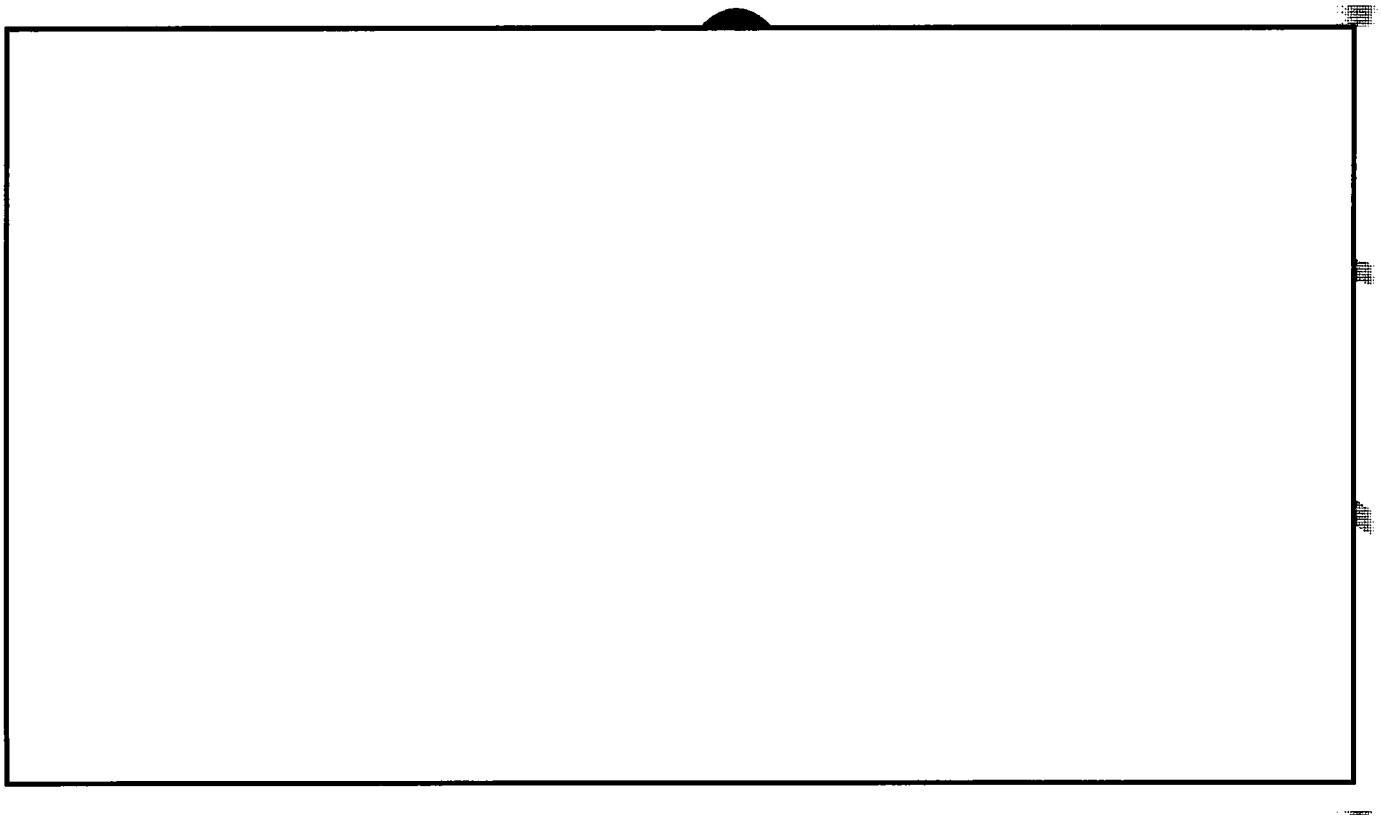
Switch	Type	Intercept Technique/Delivery	Intercept Equipment

PCS Collection System Architecture



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Interim PCS Solutions

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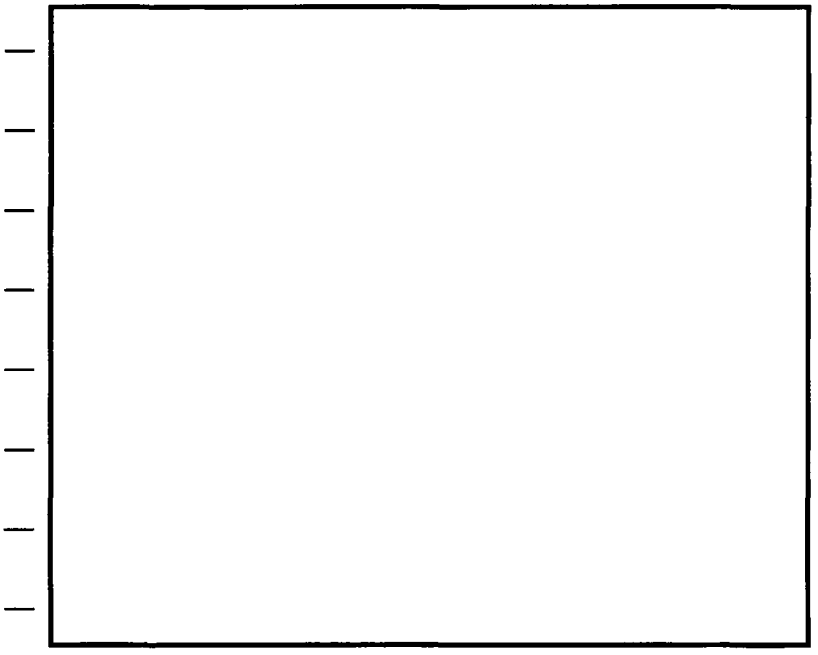

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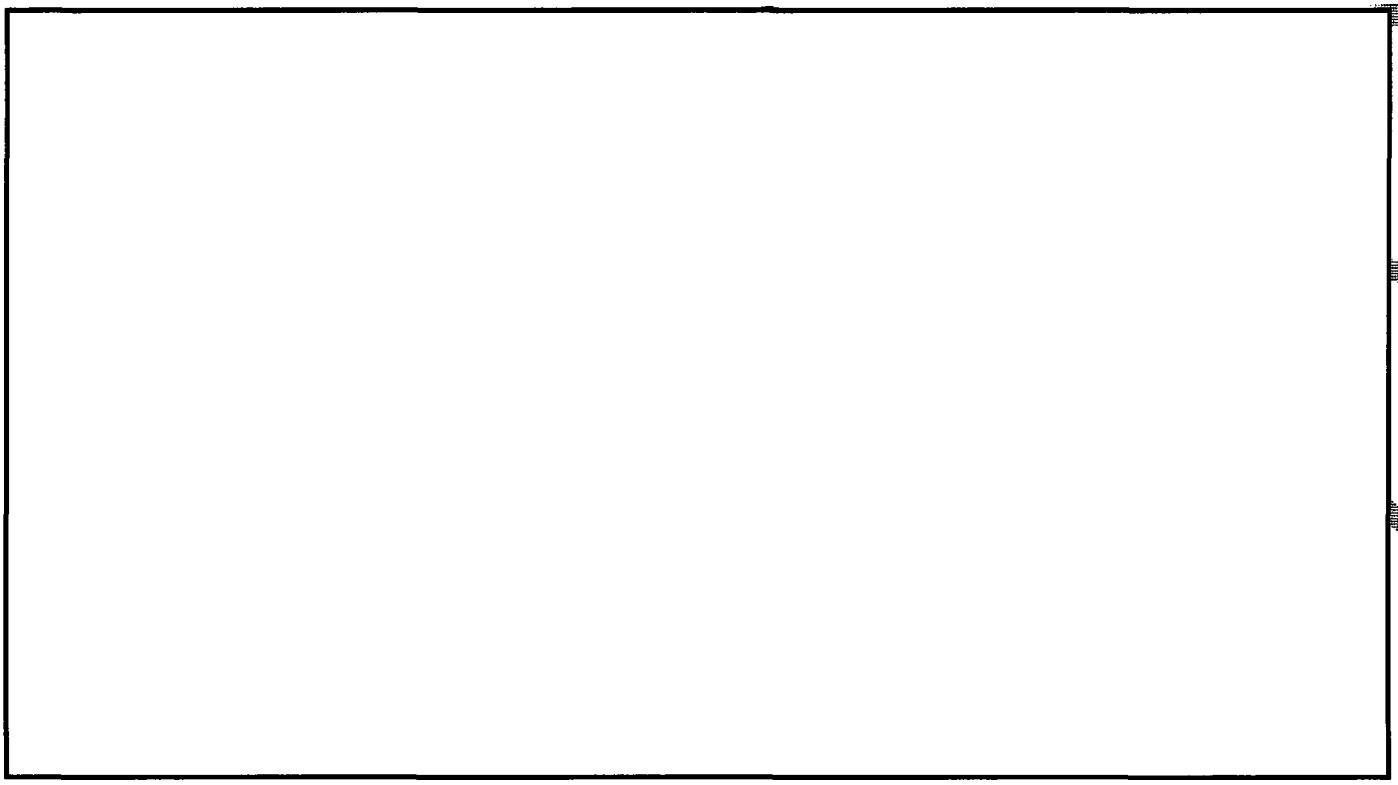
PCS Collection System Architecture



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PCS Solutions

Telecommunications Access Program
EST-3

Topics of Discussion

- Broadband PCS
- [redacted]
- Current PCS/ESMR Solutions
- DCS 3000 Hands-on Demo

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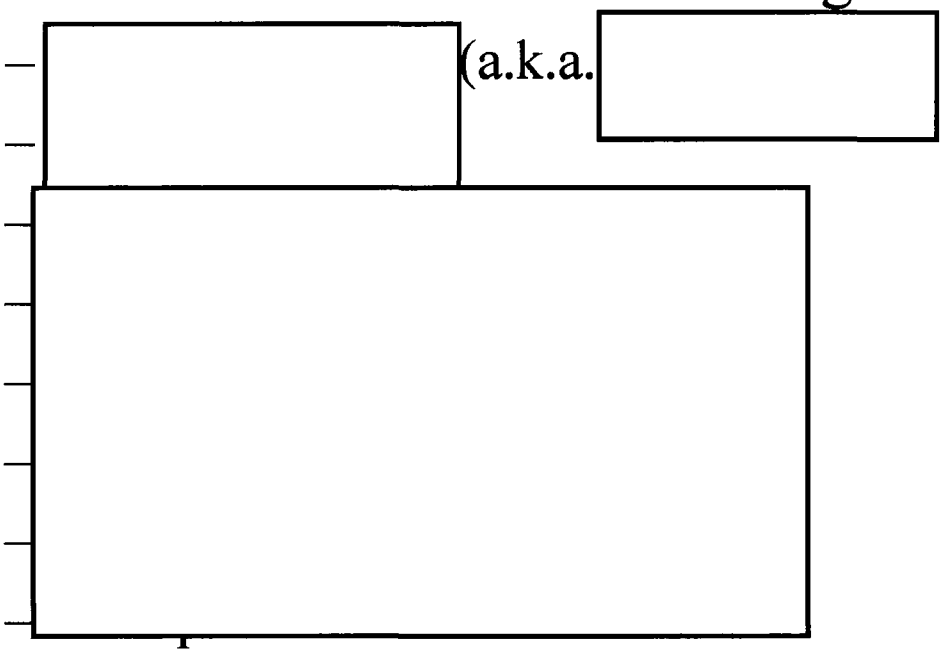
DCS-3000 System

- DCS-3000 is currently deployed in more than 33 FBI field offices covering:



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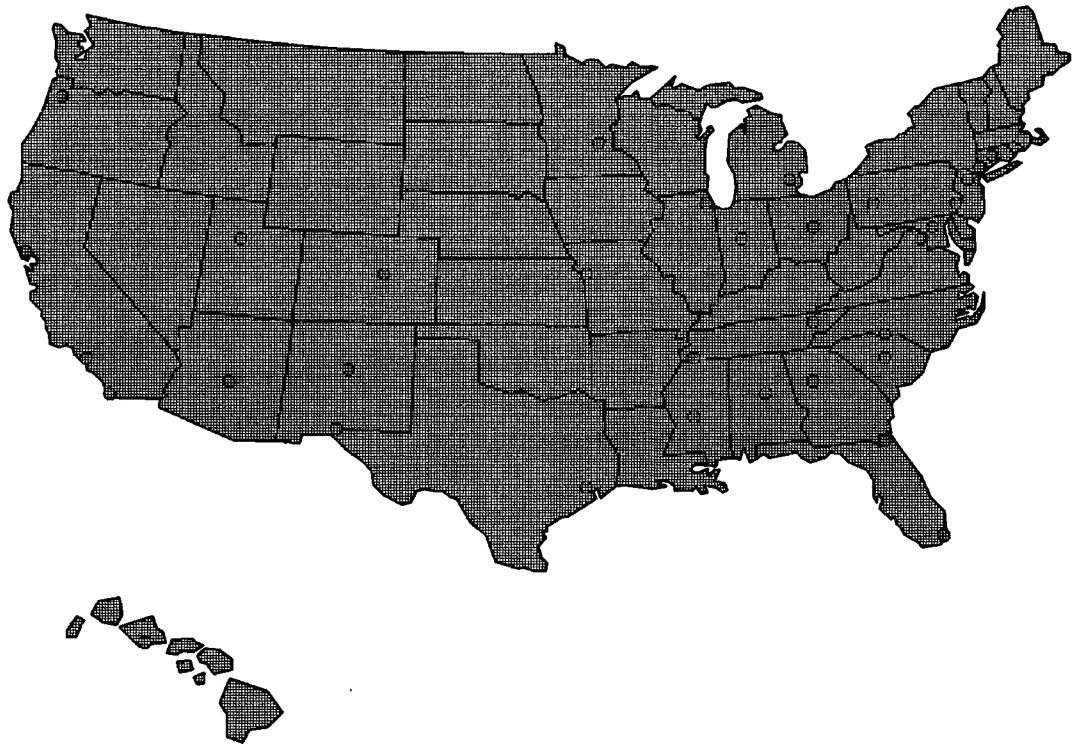
DCS-3000 Deployments



DCS-3000 Intercept/Collection System

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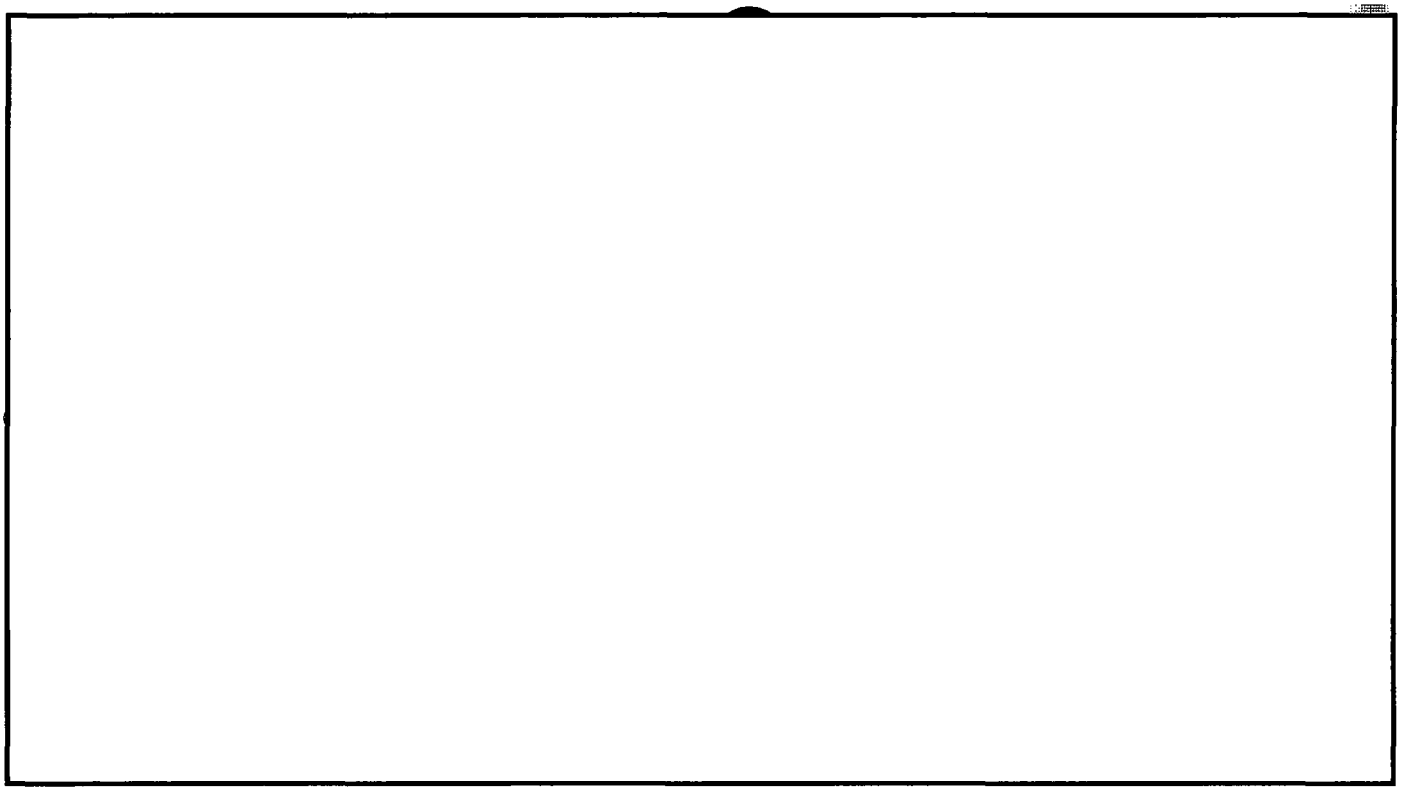

United States Department of Justice
Federal Bureau of Investigation

Telephone Interception

Telecommunications Intercept and Collection Technology Unit

November 30, 2005

Topics

- OTD Organization
- The Paradigm Shift
- *DCS-3000 and* [redacted]
- PTT Interception
- VoIP Interception
- Local Number Portability
- Caller ID Spoofing
- Online Resources

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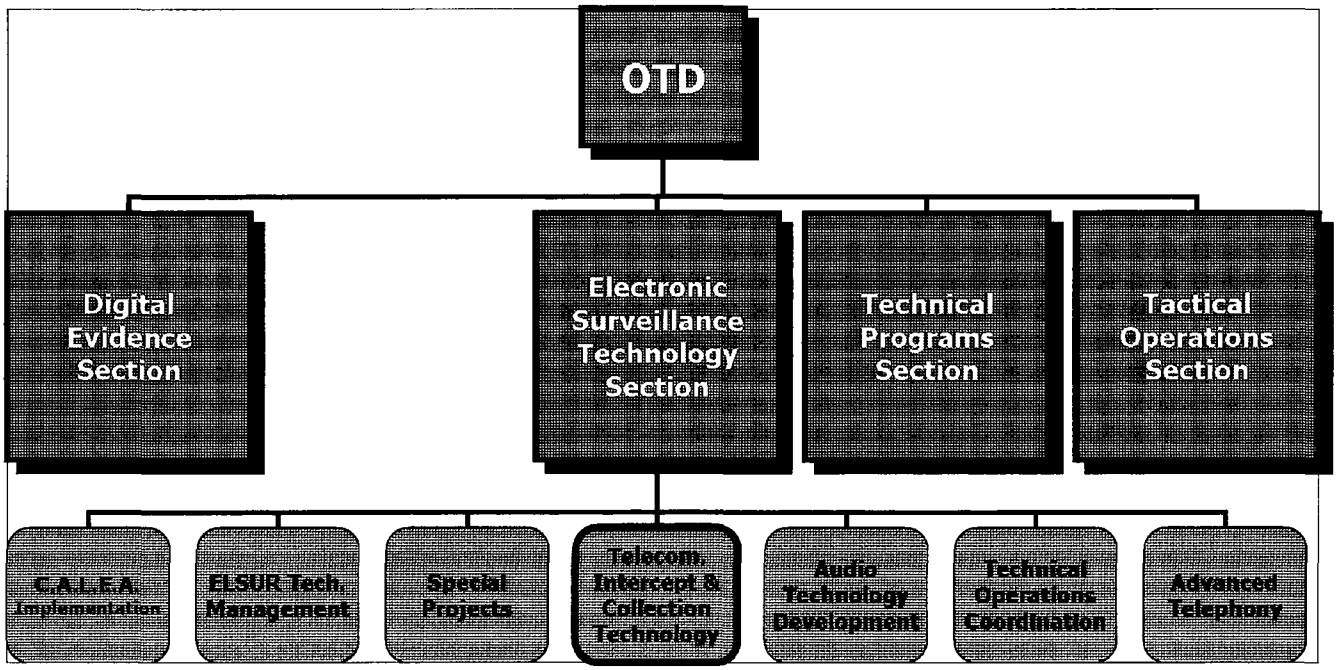
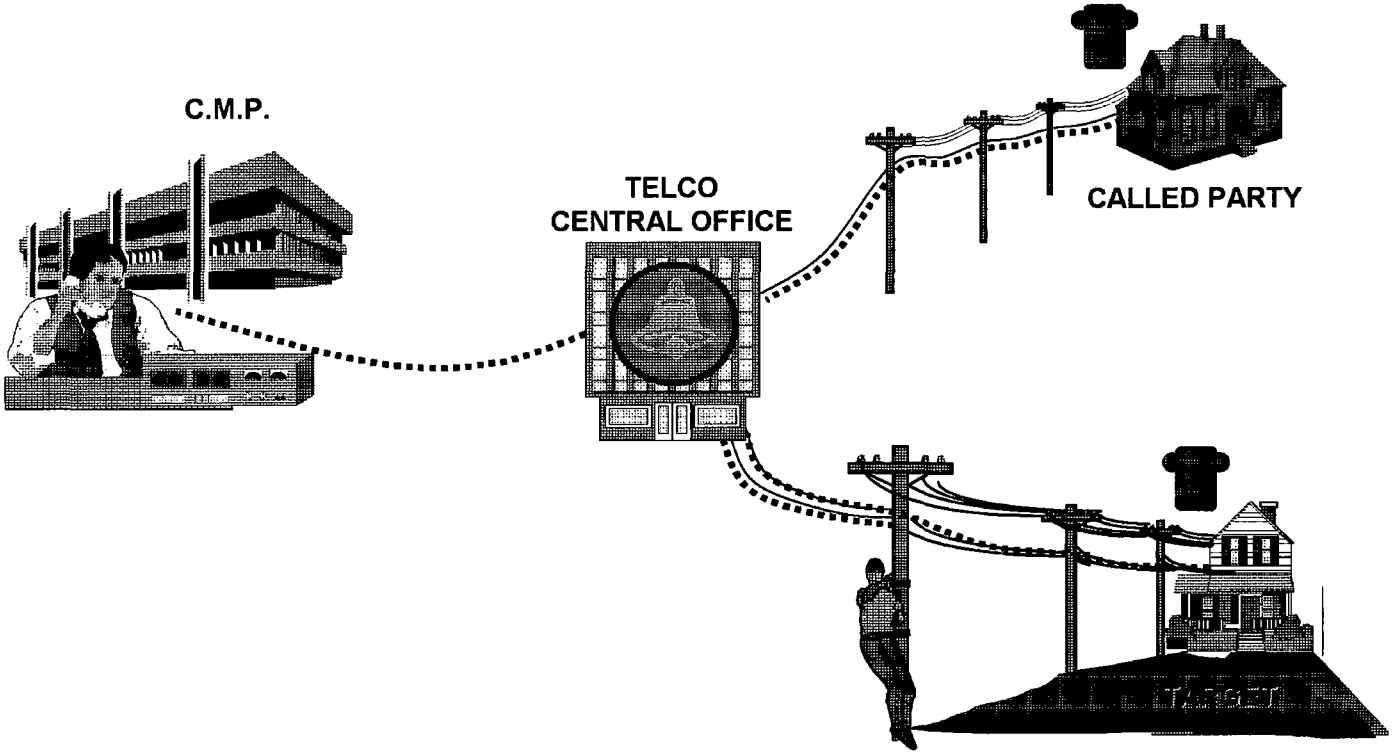
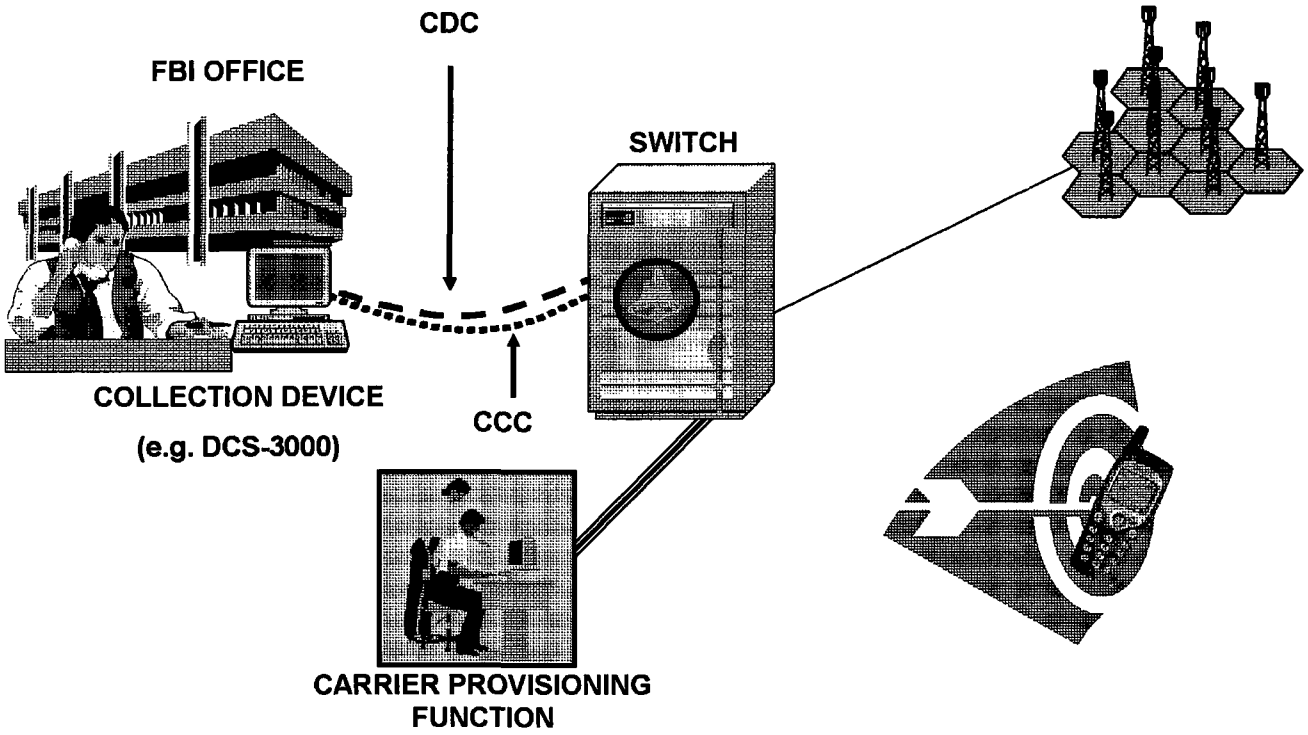
Operational Technology Division



Traditional Intercept Model



CALEA Intercept Model



DCS-3000 Numbers

- More than [redacted] intercepts supported by the DCS-3000 in FY2005

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83% Wireless
17% Landline

[redacted]

[redacted] System Architecture

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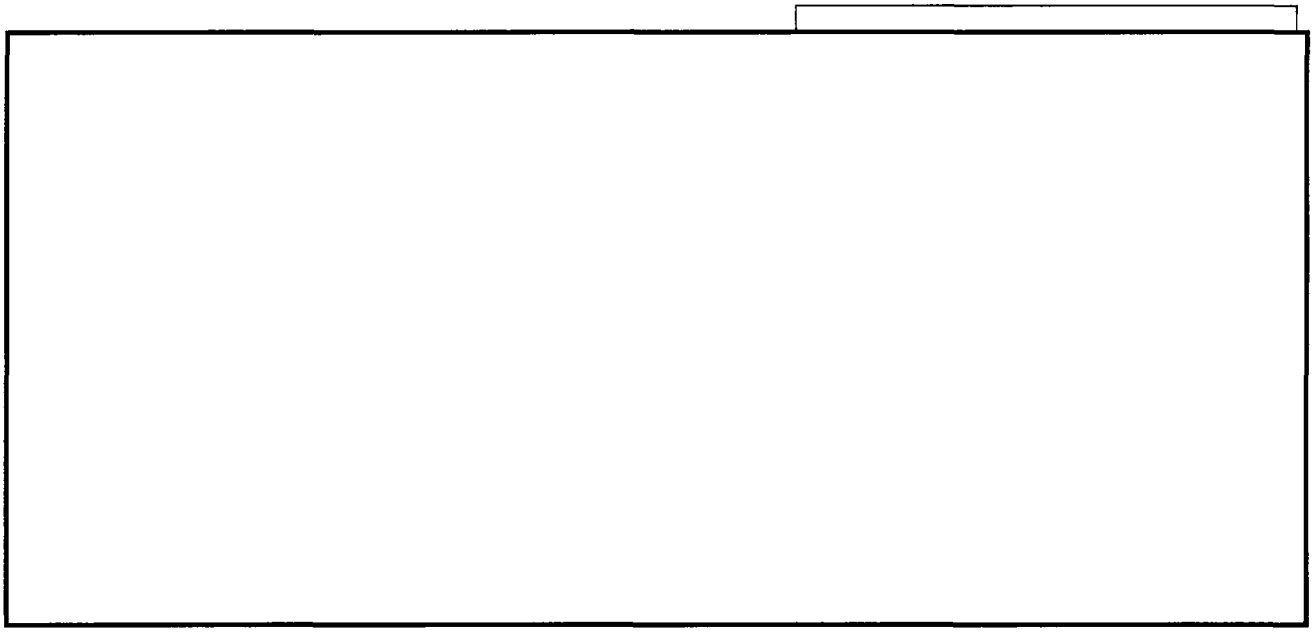

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DCS-3000

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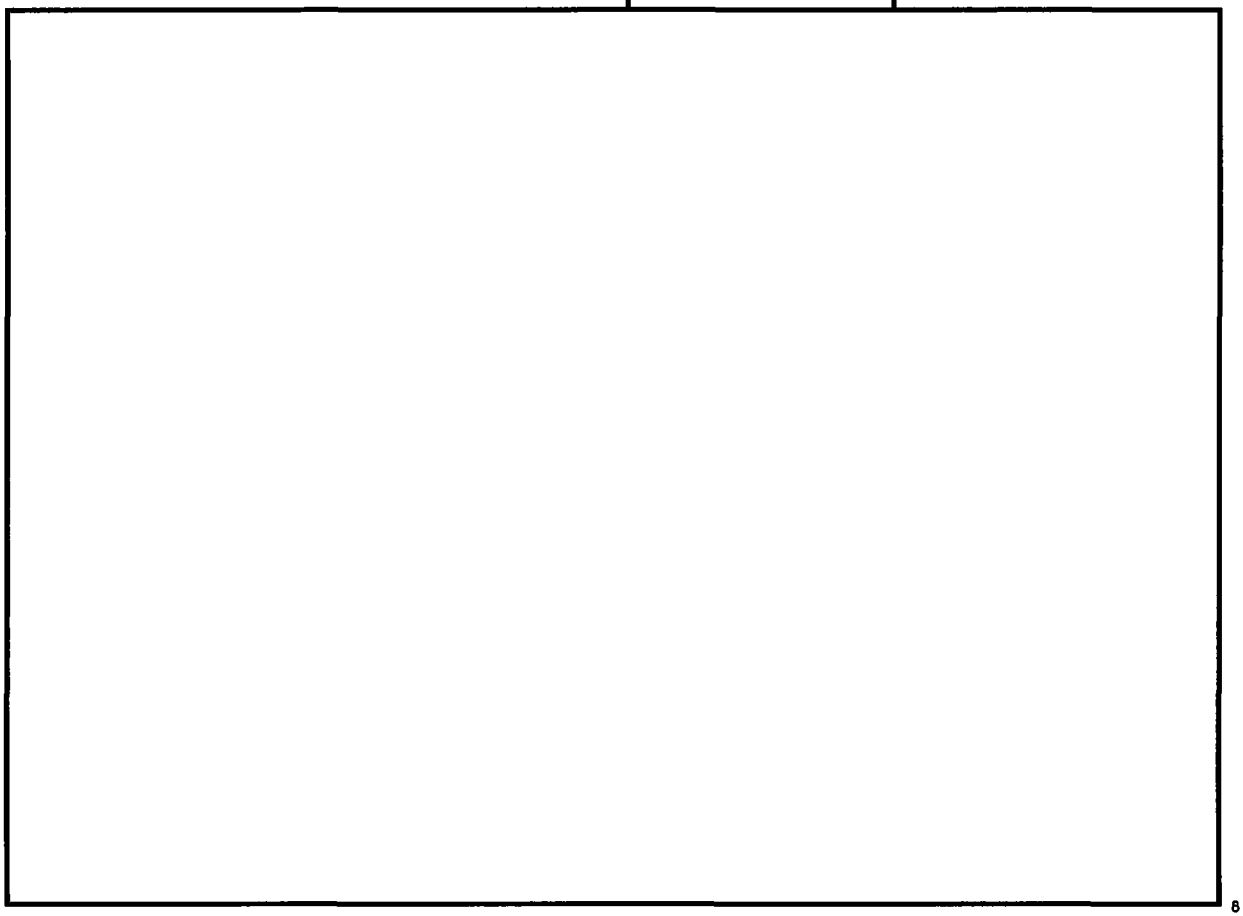

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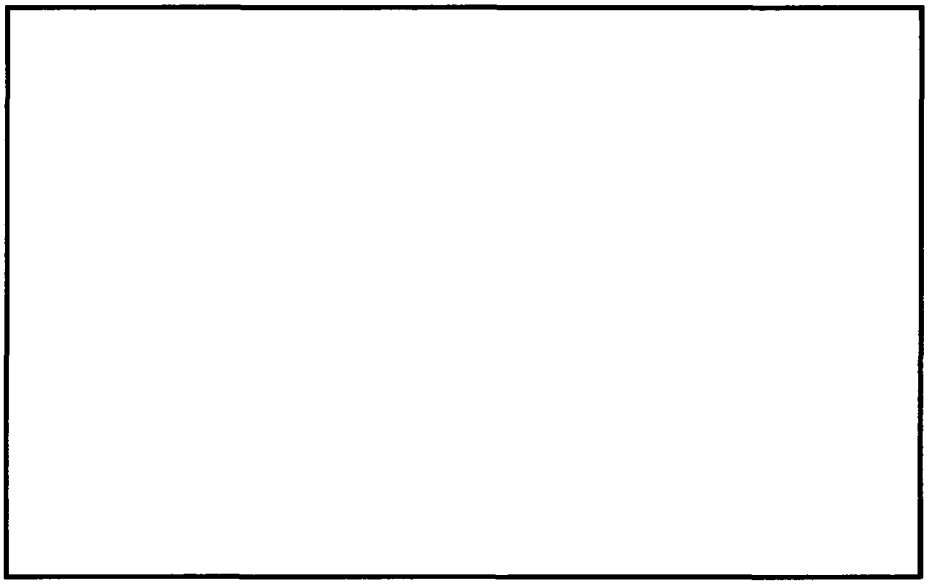

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VoIP Intercepts

- Many common carriers now deploying VoIP subscriber access technologies
- Some carriers have already embraced CALEA requirements and have intercept solutions available:
  - [redacted]

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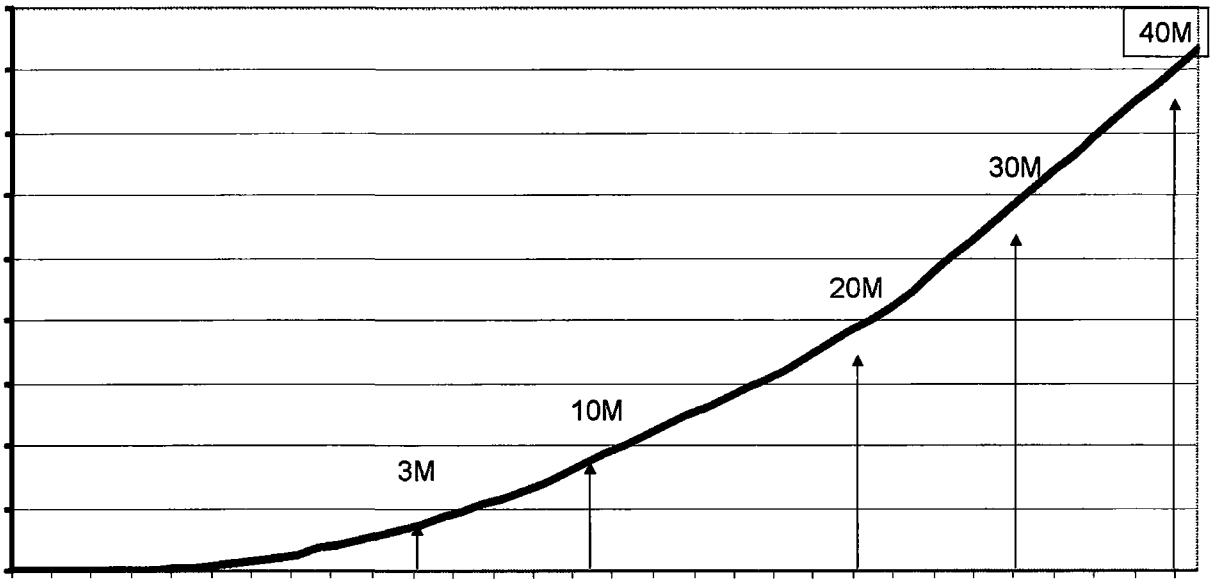
- The solutions deployed by these carriers have forced OTD to develop a new access model:
  - CDC and CCC delivery via VPN over the Internet

Local Number Portability

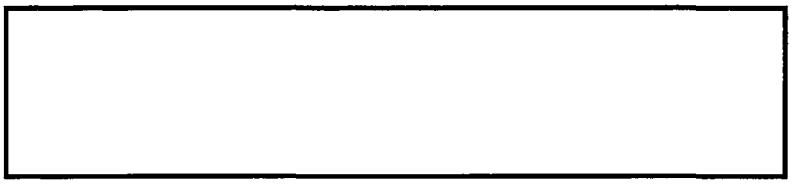
- Required by the Telecommunications Act of 1996 for landline providers
- FCC extended the requirement to wireless carriers in November 2003 – WLNP
  - Permits consumers to switch wireless carriers within the same geographic area while retaining same phone number
  - In some cases a number can be ported from a landline carrier to a wireless carrier
- Creates new challenges for law enforcement
  - NPA/NXX is not sufficient to determine the subscriber's service provider
  - Porting is not reported via CALEA messaging. If a target ports during the period of intercept, the collection will be interrupted until the new carrier is identified and served with a court order

Local Number Portability



Local Number Portability

- **Neustar Interactive Voice Response (IVR) System**
  - **Established by the telecommunications industry to assist law enforcement**
  - **Automated dial-up service handles inquires for both landline and wireless numbers**



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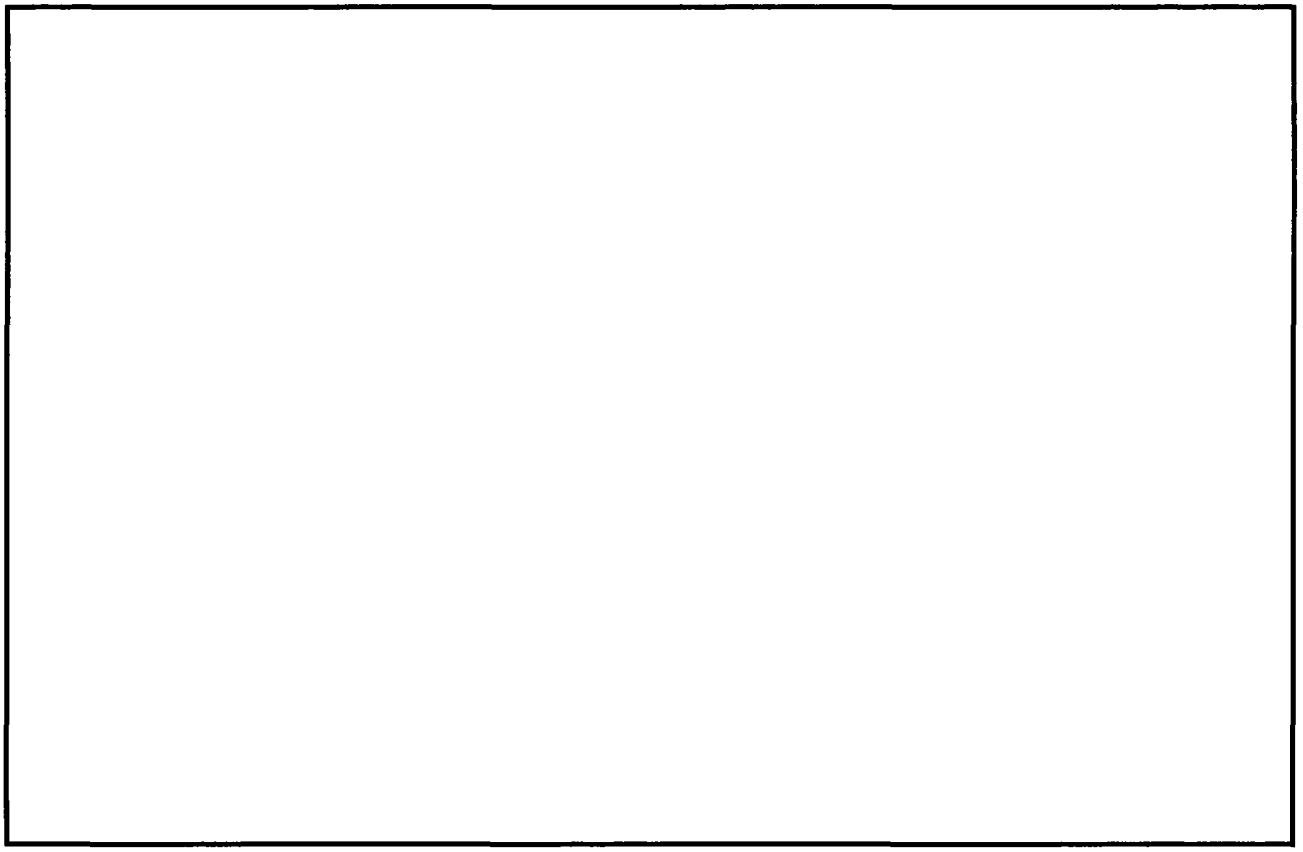
  - **Not to be used for FISA/classified target numbers**

Caller ID

- Developed by Bell Labs
- Method of displaying calling party information using the established SS7 data network
- Information is passed from the originating (calling) system to the terminating (called) system/switch and then to the called party

Caller ID



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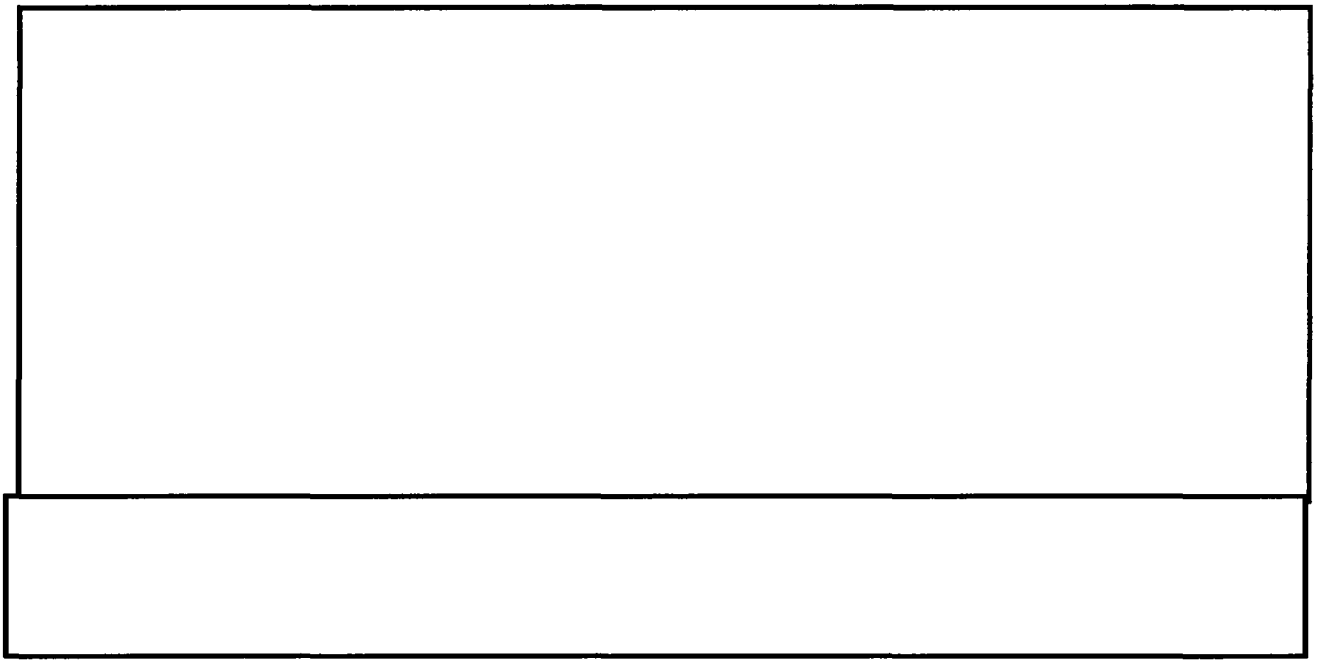
Caller ID Spoofing



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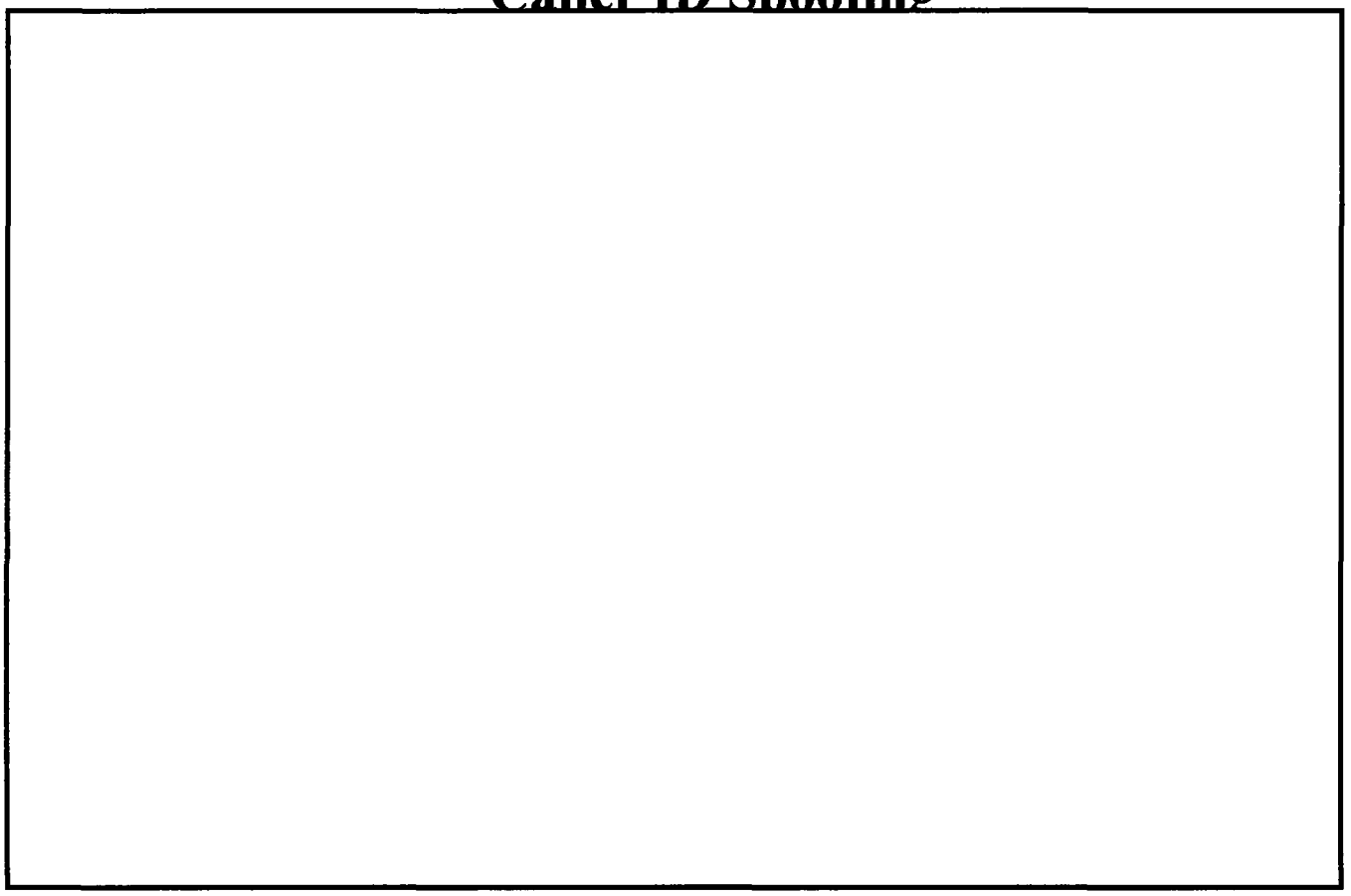
Caller ID Spoofing



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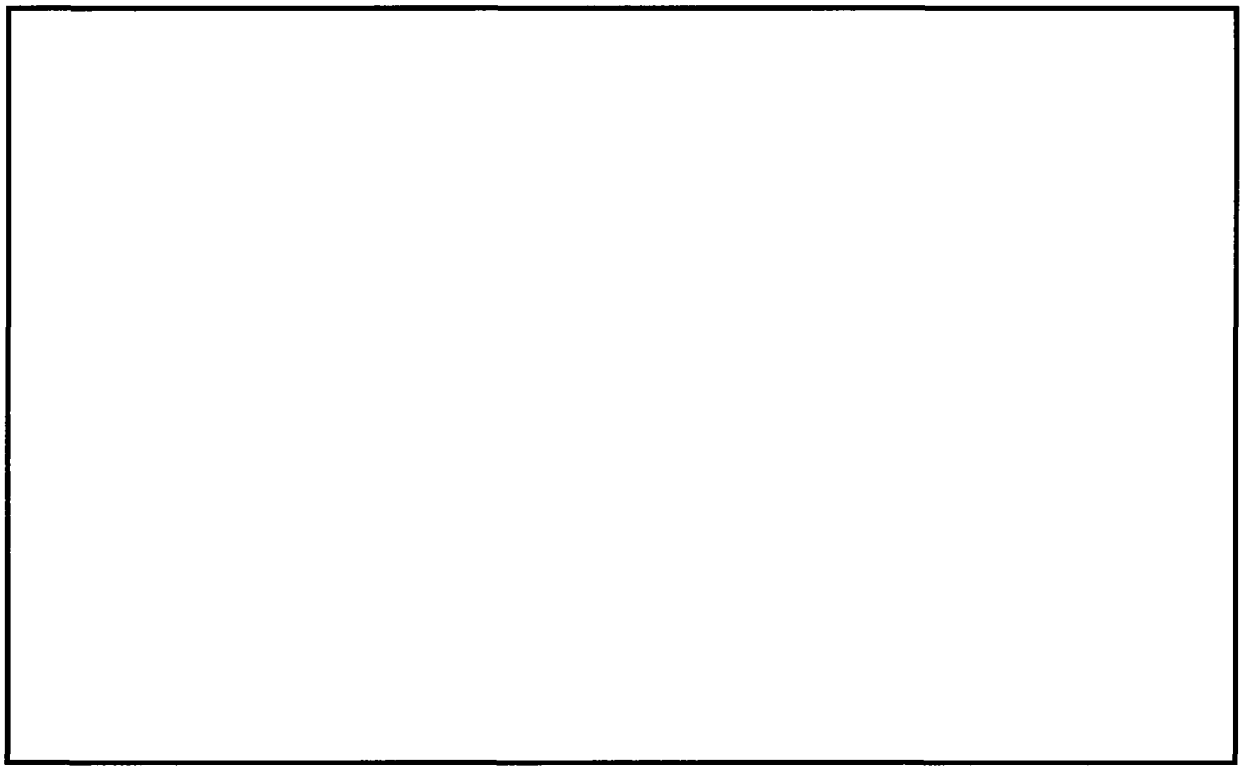
Caller ID Spoofing



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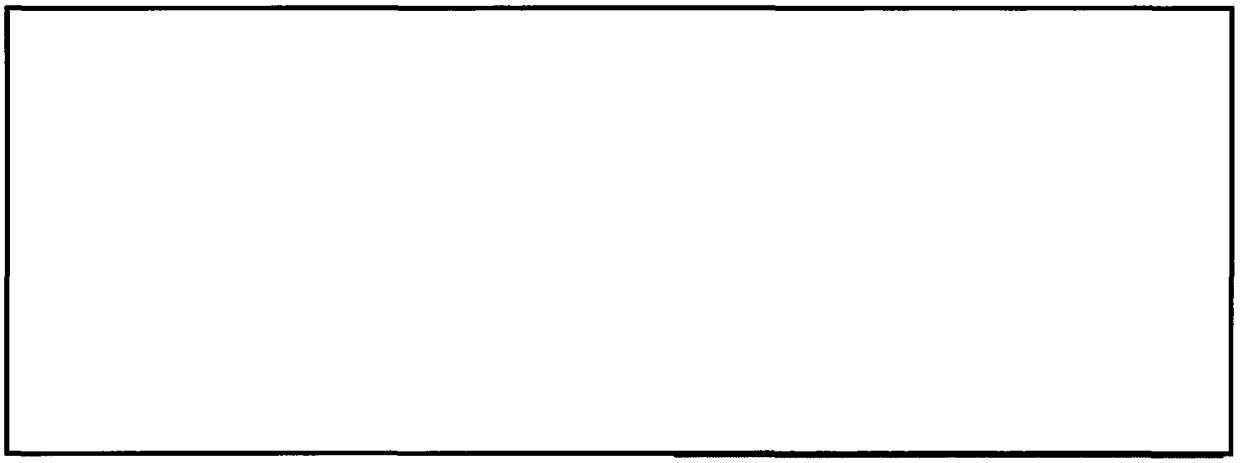
Online Resources



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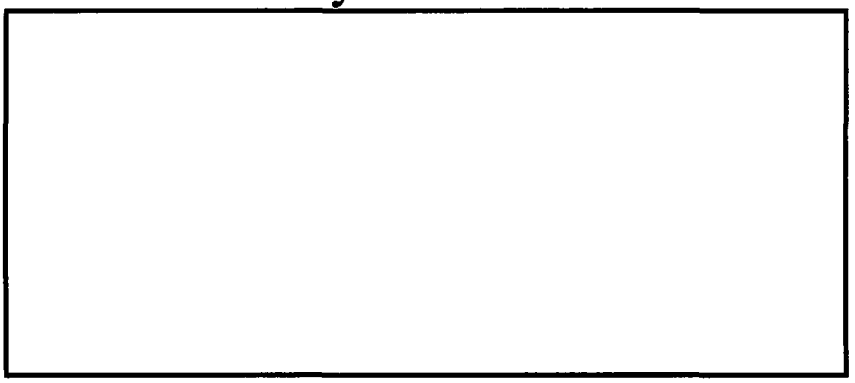
TICTU has many resources available online (Trilogy):

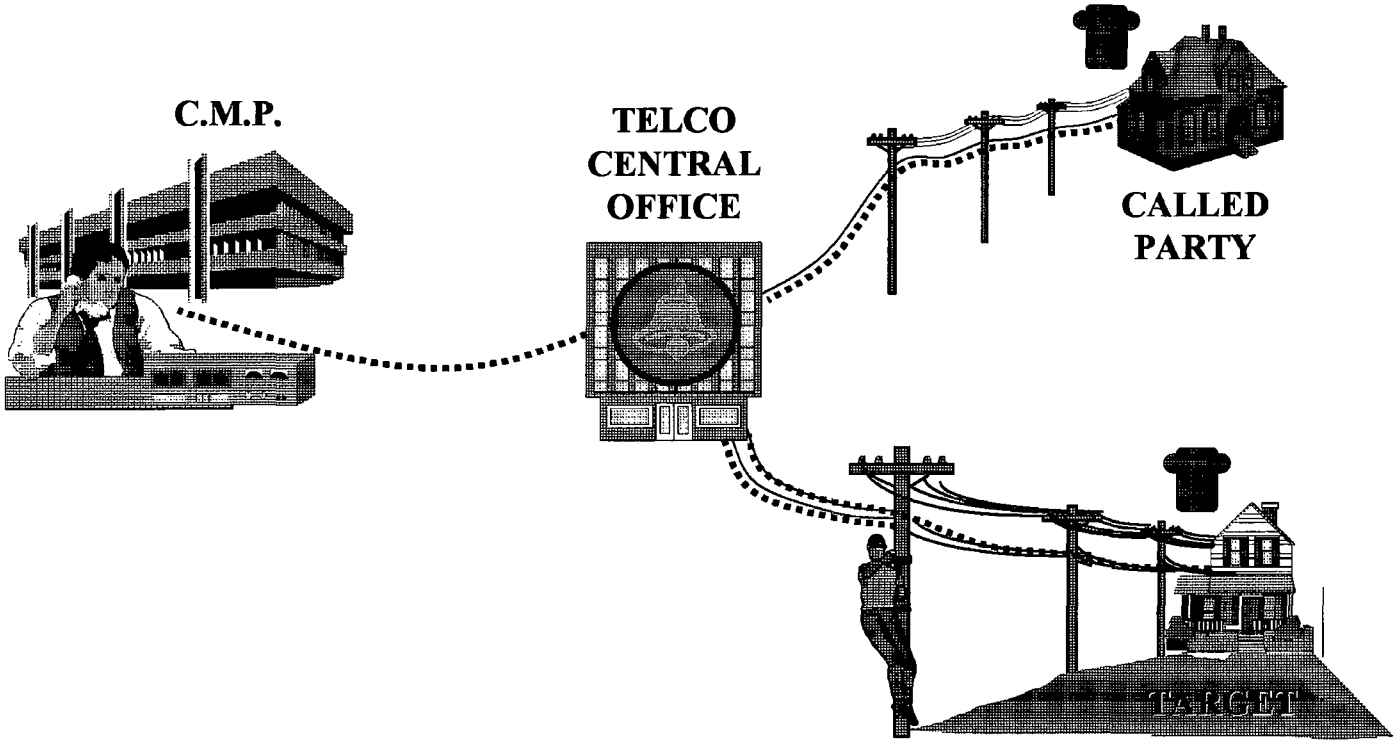


Federal Bureau of Investigation
Electronic Surveillance Technology Section
Telecommunications Intercept and Collection Technology Unit

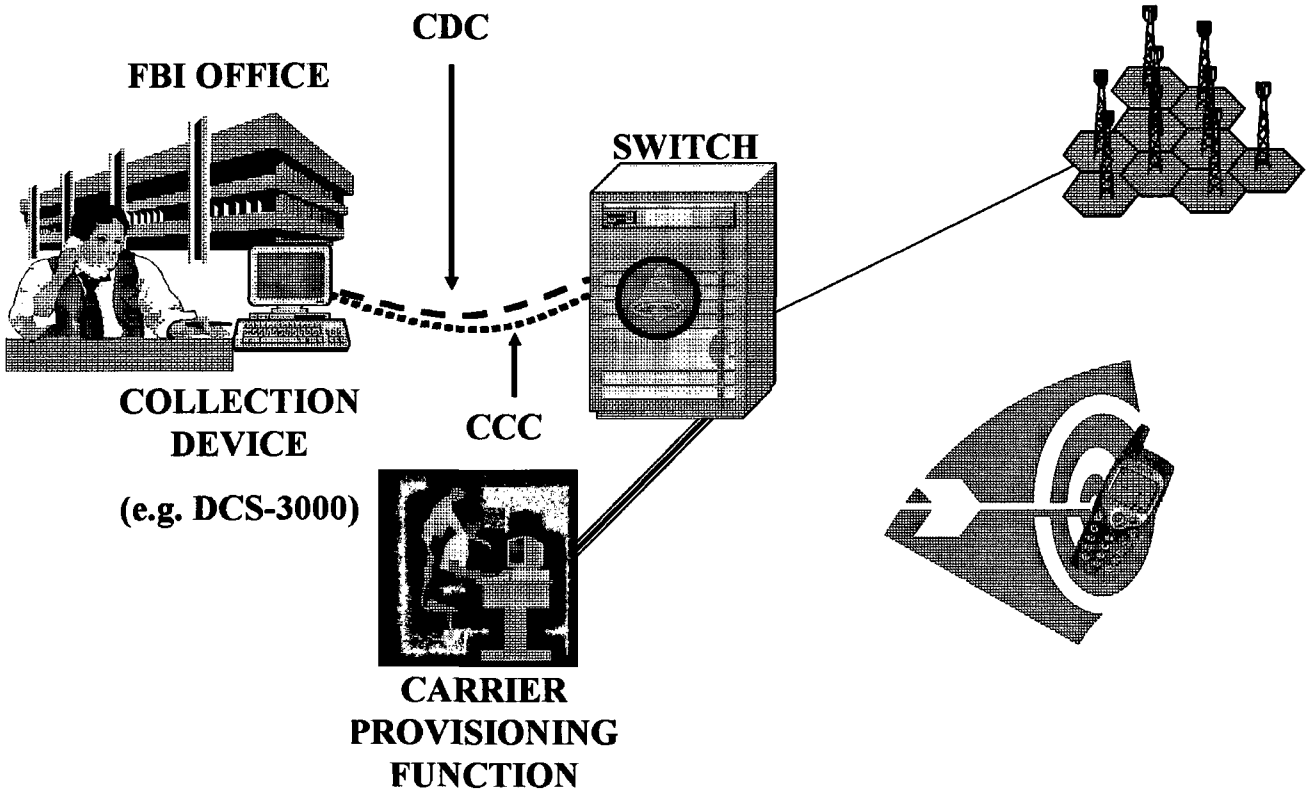
TICTU/SBIT Brief Book

Last Update 2006-01-31

Traditional Wiretap Model



CALEA Wiretap Model



CALEA Wiretap Model

CDC – Call Data Channel

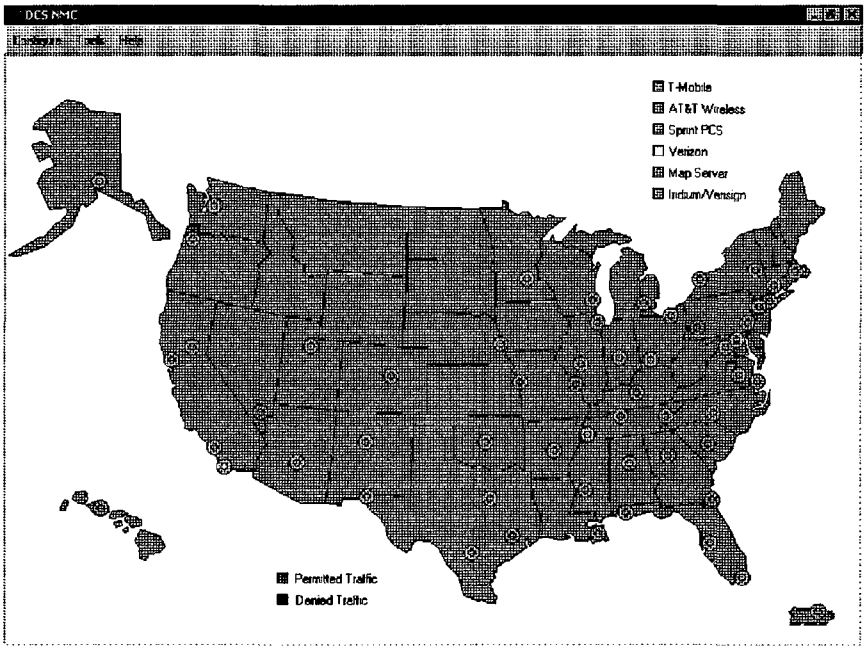
- Typically, TCP/IP or X.25 data connection
- Transports pen-register and trap/trace information
- One CDC per intercept access point (i.e. switch or network)

CCC – Call Content Channel

- Typically, circuit switched
- Transports intercepted content/audio
- At least one CCC per target

CALEA CDC and CCC delivered independently

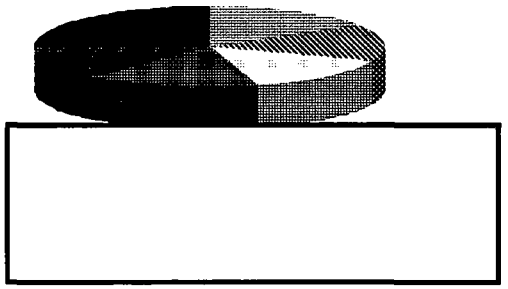
DCSnet Backbone Delivery



CALEA-Enabled Intercepts

CALEA-based intercepts conducted with <u>more than 50</u> U.S. carriers in 2005

92% Wireless
8% Landline



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CDC Delivery

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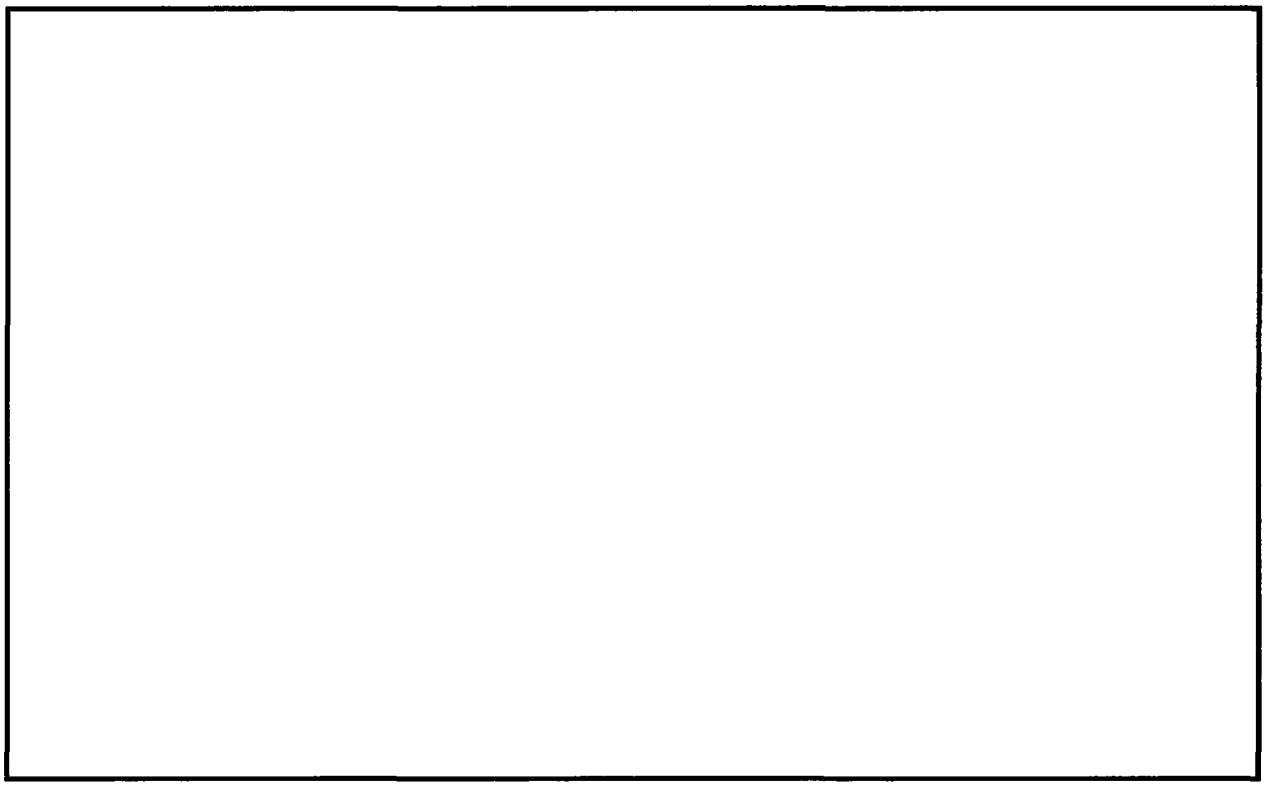
CCC Delivery



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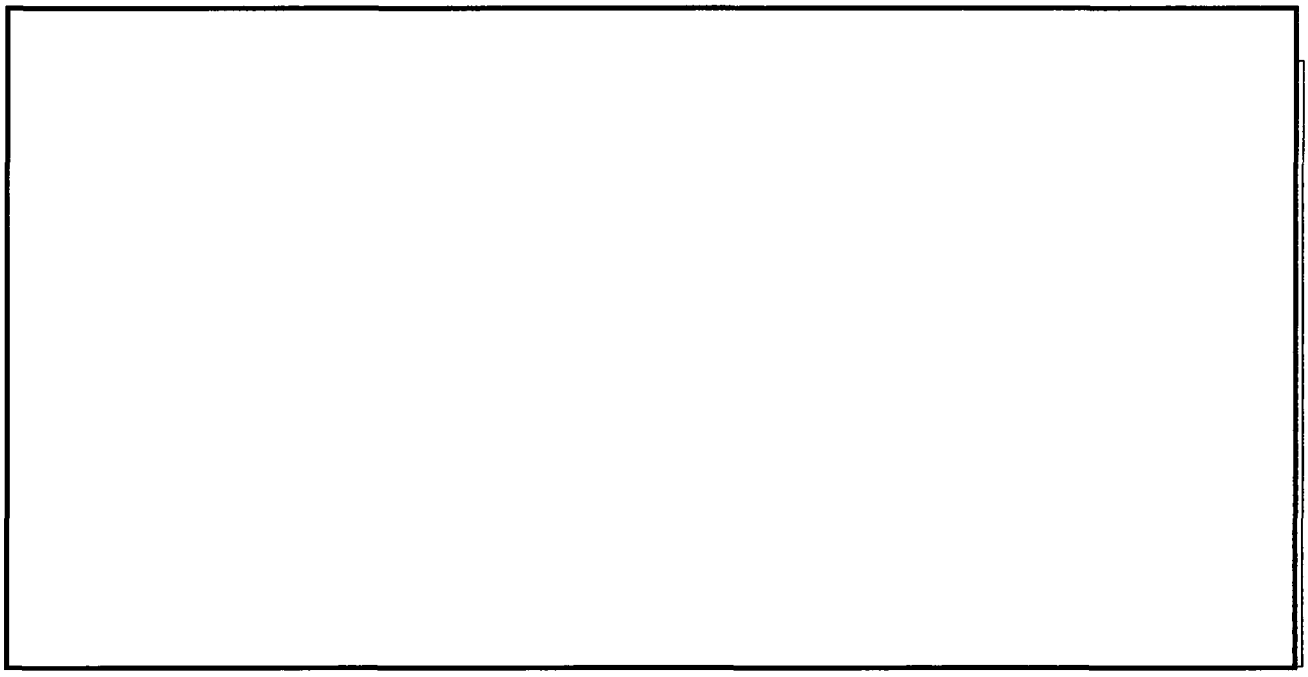
DCS 3000



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VoBro Experiences

- Many common carriers now deploying VoIP and VoP subscriber access technologies
- Some carriers have already embraced CALEA requirements and have intercept solutions available:
  - [redacted] b2 b7E
- The solutions deployed by these carriers have forced the FBI to develop a new access model:
  - CDC and CCC delivery via VPN over the Internet

VoBro Experiences

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VoBro Experiences

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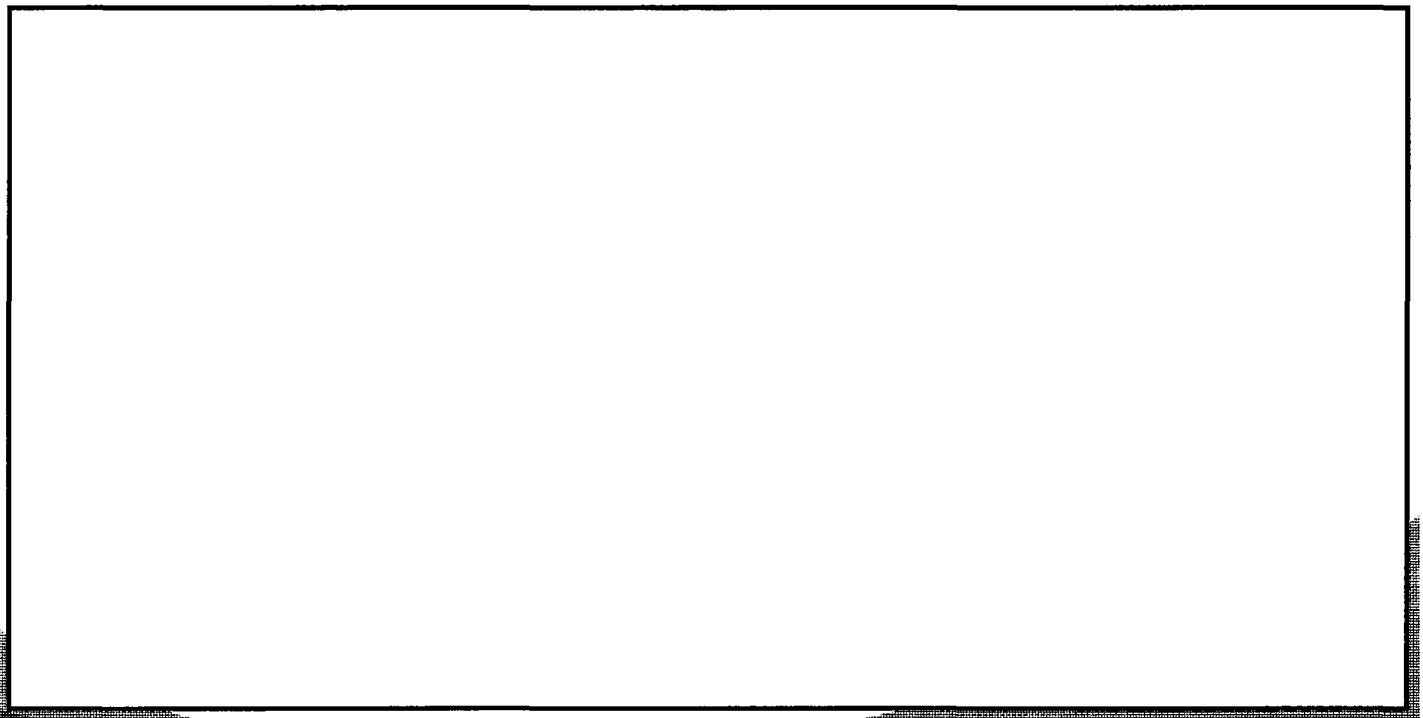

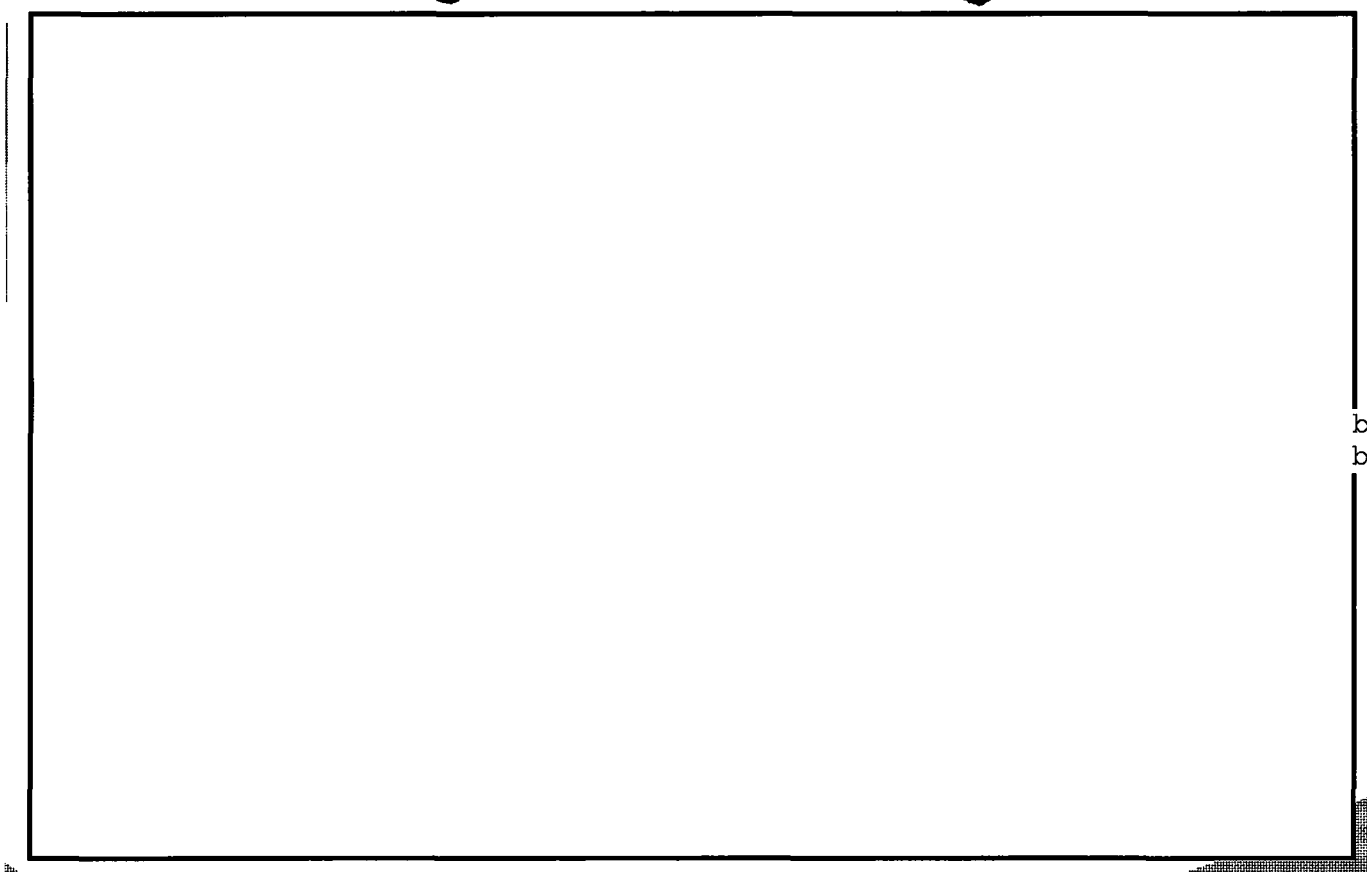

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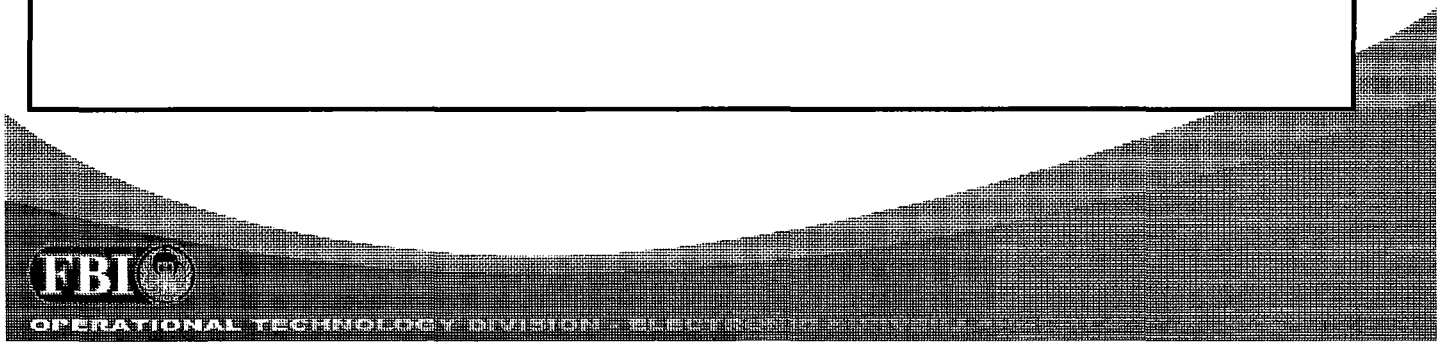
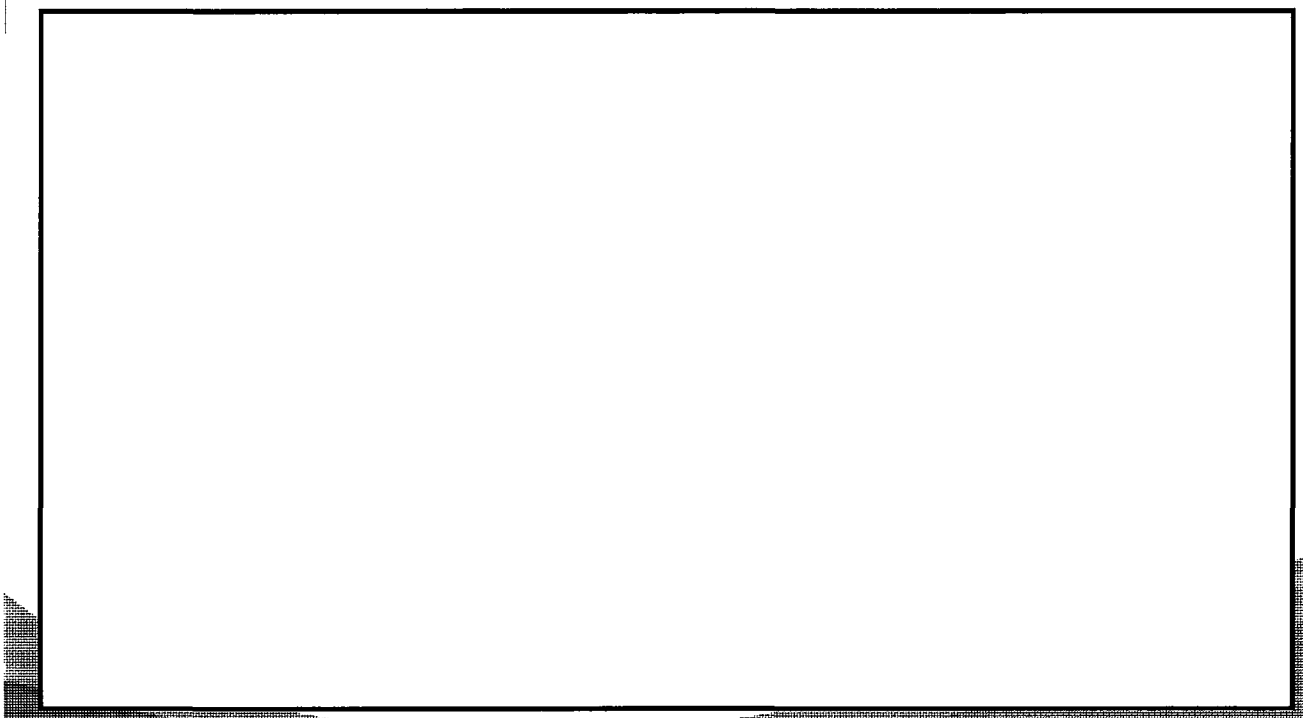


Skype In/Out



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