
SUMMARY

At no time in the history of public safety communications have so many options been available. Technological advances and regulatory changes have combined to make selecting a communications system very complex. As we move into the future, it is unlikely to get any better.

NLECTC–Rocky Mountain and other groups [such as the Federal Public Safety Wireless Network program (PSWN)] are dedicated to helping you through the maze of technology jargon and bureaucratic rules as you proceed on your communications project.

We hope this guidebook has been useful to you. We welcome your comments and suggestions for improvement.

GLOSSARY AND ACRONYMS

Glossary

Amplifier: A device for obtaining an increase in voltage, current, or power.

Amplitude: Maximum departure of the value of an alternating current or radio wave from the zero point.

Analog: A signal that may vary continuously over a specific range of values.

Antenna: A device (usually metallic) for radiating or receiving radio waves.

Band: A well-defined range of wavelengths or frequencies.

Bandwidth: The range within a band of frequencies. A measure of the amount of information that can flow through a given point at any given time.

Bit: Abbreviation for binary digit (either a 0 or a 1), the basic unit for storing data in a computer.

Block grant: Federal grant funds that are allocated based on a predetermined statutory formula.

Cavity filter: A radio frequency device used to reduce interference to a receiver or from transmitter to other nearby radio frequency devices. Cavity filters are the primary component in a duplexer.

Channel: A band of frequencies of sufficient width to support a single radio communications path.

Combiner: A device used to combine the output signals from a number of transmitters into one antenna.

Coverage: The amount or percentage of area reached by a communications medium.

Cycle: One complete performance of a vibration, electrical oscillation, current alternation, or other periodic process.

Decibel: A unit for measuring the power of an electromagnetic signal; equal to the logarithm of the ratio of the measured signal to that of an arbitrary standard.

Digital: Information that can be represented by two discrete states (either 0 or 1). Most information in the speaking/seeing world is not digital, but must be converted into this form to be used by computers.

Dipole: A radio antenna consisting of two rods in line with each other, with their ends slightly separated.

Discretionary grant: Federal grant funds that are distributed at the discretion of the agency administering the funds.

Duplexer: A device that allows a radio transmitter and receiver to share the same radio antenna without interference to each other.

Effective Radiated Power: A term to describe radio system transmitted power that takes into account transmitter output power, combiner and feedline losses, and antenna gain.

Flowchart: A diagram showing the step-by-step progression through a complicated process or system.

Formula grant: Federal grant funds that are allocated based on a predetermined statutory formula.

Frequency: The number of repetitions of a periodic process in a unit of time.

Frequency multiplier: A device for multiplying the frequency up to a desired output frequency.

Gain: The effectiveness of a directional antenna, given as the ratio in decibels of standard antenna input power to the directional antenna input power producing the same field strength in the desired direction.

Guard band: A non-overlapping space between radio channels used to minimize interference.

Hertz: Alternate term for cycles per second, abbreviated as Hz.

Implementation team: A group of officials charged with ensuring that a project is planned, managed, and completed.

Infrastructure: The underlying permanent installations required for radio communications. Infrastructure includes antennas, base/repeater stations, consoles, links (fiber, microwave, radio and wire), towers, and support structures (such as buildings and towers).

Interference: Confusion of received radio signals due to strays or undesired signals.

Isolator: A device that may be added to the circuit between each transmitter and the combiner and used to increase the isolation to the other transmitter outputs.

Isotropic radiator: A theoretical antenna that radiates equally in all directions.

Modem: An acronym for modulator/demodulator, which is a device that translates digital signals coming from your computer or other digital device into analog signals that can be transmitted over standard telephone lines or radio circuits. The modem also translates the analog signal back into a digital signal.

Modulation: The process of implanting information onto a wave by varying the amplitude, frequency, or phase of a carrier or signal in telephone, radio, or television.

Multicoupler: A device used to connect a multitude of receivers to a single antenna.

Noise: An unwanted signal or disturbance (e.g., static) in a radio communications system.

Omnidirectional: Receiving or sending radio waves equally well in all directions.

Oscillator: A device for producing alternating current, specifically for producing radio frequencies.

Polarization: The action or process of affecting radiation so that the vibrations of the wave assume a definite form, usually horizontal or vertical as compared to the earth's surface.

Propagation: The action of traveling and spreading through space, in reference to wave energy.

Receiver: The portion of a radio device that converts the radio waves received over the air into a usable audible signal or data stream.

Refarming: An administrative process being conducted by the FCC to reduce channel bandwidths and, as a result, promote spectrum efficiency.

Repeater: A transmitter and a receiver operating on different frequencies and connected such that the signal received on one frequency is simultaneously retransmitted on the other frequency. Repeaters are often connected to a common antenna using a combiner.

Skip: The phenomenon by which a radio wave reflects from the ionosphere during the height of the sunspot cycle, often resulting in severe interference problems on frequencies below about 90 MHz.

Spectrum: The region of the electromagnetic spectrum in which radio transmission and detection techniques may be used.

Spectrum efficiency: Optimizing the amount of information sent over a given amount of bandwidth.

Steering Committee: A group of usually high-level officials charged with setting policy for a project.

Transmitter: The portion of a radio device that converts an audible signal or data stream into a radio wave and sends it out over the air.

Vocoder: Abbreviation for voice coder, a circuit that samples an analog voice frequency and then changes the sampled information into binary digits to modulate a digital transmitter.

Wave: A disturbance or variation that transfers energy progressively from point to point in a medium and that may take the form of a variation in electric or magnetic intensity or electric potential.

Wavelength: The distance from one point along the progression of a wave to the next point on the wave of corresponding amplitude and phase.

Acronyms

1XRTT	Single carrier (1x) Radio Transmission Technology
3G	Third generation wireless
AASHTO	American Association of State Highway Transportation Officials
ACSB	Amplitude Compandered Single Sideband
AGILE	Advanced Generation of Interoperability for Law Enforcement
AM	Amplitude Modulation
AMPS	Advanced Mobile Phone System
ANSI	American National Standards Industry
APCO	Association of Public-Safety Communications Officials, International
AVL	Automatic Vehicle Location
BJA	Bureau of Justice Assistance
BJS	Bureau of Justice Statistics
CALEA	Commission on Accreditation for Law Enforcement Agencies
CALEA	Communications Assistance for Law Enforcement Act
CAPRAD	Computer Assisted Pre-coordination Resource and Database
CCITT	International Telegraph and Telephone Consultative Committee
CDMA	Code Division Multiple Access
CDPD	Cellular Digital Packet Data
CFR	Code of Federal Regulations
COPS	Community Oriented Policing Services
COTS	Commercial Off-the-Shelf Software
CTCSS	Continuous Tone-Coded Squelch System
CDCSS	Continuous Digital-Coded Squelch System
DAWS	Digital Advanced Wireless Services
dB	Decibel
DOC	Department of Commerce
DoD	Department of Defense
DOJ	Department of Justice
DOT	Department of Transportation
DSP	Digital Signal Processing
EHF	Extremely High Frequency
EIS	Environmental Impact Statement
EMS	Emergency Medical Service
ERP	Effective Radiated Power
ESA	Endangered Species Act
ESMR	Enhanced Specialized Mobile Radio
ETSI	European Telecommunications Standards Institute
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission

Glossary and Acronyms

FCCA	Forestry Conservation Communication Association
FDMA	Frequency Division Multiple Access
FEMA	Federal Emergency Management Agency
FLEWUG	Federal Law Enforcement Wireless Users Group
FM	Frequency Modulation
FSK	Frequency Shift Keying
GEO	Geosynchronous Earth Orbit
GHz	Gigahertz (1 billion cycles per second)
GITSB	Government Information Technology Services Board
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSA	General Services Administration
GSM	Global System for Mobile Communications
HALE	High Altitude Long Endurance
HAP	High Altitude Platform
HF	High Frequency
Hz	Hertz (cycles per second)
IACP	International Association of Chiefs of Police
IAFC	International Association of Fire Chiefs
ICS	Incident Command System
IEEE	Institute of Electrical and Electronic Engineers
IGA	Intergovernmental Agreement
IM	Intermodulation
IMSA	International Municipal Signal Association
ISP	Internet Service Provider
JPA	Joint Powers Authority
KHz	Kilohertz (1,000 cycles per second)
LAN	Local Area Network
LCRA	Lower Colorado River Authority
LEAA	Law Enforcement Assistance Administration
LEO	Low Earth Orbit
LLEBG	Local Law Enforcement Block Grants
LOS	Line of Sight
MBTA	Migratory Bird Treaty Act
MEO	Medium Earth Orbit
MESA	Mobile Broadband for Emergency and Safety Applications
MHz	Megahertz (1 million cycles per second)
MIU	Mobile Imaging Unit
MTSO	Mobile Telephone Switching Office
NAMPS	Narrowband Advanced Mobile Phone System
NASTD	National Association of State Telecommunications Directors
NATO	North Atlantic Treaty Organization
NCC	National Coordination Committee
NENA	National Emergency Number Association
NCIC	National Crime Information Center

NCJRS	National Criminal Justice Reference Service
NCS	National Communications Systems
NEPA	National Environmental Policy Act
NENA	National Emergency Number Association
NHPA	National Historic Preservation Act
NIC	Network Interface Card
NIJ	National Institute of Justice
NIST	National Institute of Standards and Technology
NLECTC	National Law Enforcement and Corrections Technology Center
NPSAC	National Public Safety Planning Advisory Committee
NPSTC	National Public Safety Telecommunications Council
NTIA	National Telecommunications and Information Administration
OET	Office of Engineering and Technology
OJJDP	Office of Juvenile Justice and Delinquency Prevention
OJP	Office of Justice Programs
OLES	Office of Law Enforcement Standards
OST	Office of Science and Technology
OTAR	Over-The-Air-Rekeying
PAN	Personal Area Network
PBX	Private Branch Exchange
PCMCIA	Personal Computer Memory Card International Association
PCS	Personal Communications System
PDA	Personal Digital Assistant
PLMRS	Private Land Mobile Radio Service
POCSAG	Post Office Code Standardization Advisory Group
PSCC	Public Safety Coordinating Council
PSPP	Public Safety Partnership Project
PSTN	Public Switched Telephone Network
PSWAC	Public Safety Wireless Advisory Committee
PSWN	Public Safety Wireless Network
RF	Radio Frequency
RFI	Request for Information
RFP	Request for Proposals
RFQ	Request for Quotation
SDMA	Space Division Multiple Access
SDR	Software Defined Radio
SHF	Super High Frequency
SIEC	State Interoperability Executive Committee
SIS	State Identification Systems
SMR	Specialized Mobile Radio
SMS	Short Messaging System
TCP/IP	Transmission Control Protocol/Internet Protocol
TDMA	Time Division Multiple Access
TETRA	TERrestrial TRunked Radio
TIA	Telecommunications Industry Association

Glossary and Acronyms

TIIAP	Telecommunications and Information Infrastructure Assistance Program
TOP	Technology Opportunities Program (formerly TIIAP)
UART	Universal Receiver/Transmitter
UHF	Ultra High Frequency
ULS	Universal Licensing System
UWB	Ultra Wide Band
VHF	Very High Frequency
VoIP	Voice Over Internet Protocol
WAN	Wide Area Network
WAP	Wireless Access Point
WLAN	Wireless Local Area Network
WRC	World Radio Conference
WSCA	Western States Contracting Alliance

APPENDICES

Appendix A

State Agencies Administering Byrne Program Grants

ALABAMA

Department of Economic and
Community Affairs
<http://www.adeca.state.al.us/index.html>
334-242-5811

ALASKA

Alaska State Troopers
<http://www.dps.state.ak.us/ast/>
907-269-5641

AMERICAN SAMOA

Criminal Justice Planning Agency
<http://www.government.as/gov.htm>
011-684-633-5221

ARIZONA

Criminal Justice Commission
http://acjc.state.az.us/grant_programs.html
602-230-0252

ARKANSAS

Office of Intergovernmental
Services
<http://www.state.ar.us/dfa/intergovernmental/index.html>
501-682-2579

CALIFORNIA

Office of Criminal Justice Planning
<http://www.ocjp.ca.gov/>
916-324-9140

COLORADO

Department of Public Safety
<http://cdpsweb.state.co.us/dcj/dcj.htm>

303-239-4400

CONNECTICUT

Office of Policy and Management
<http://www.opm.state.ct.us/pdpd1/grants/DCSI.HTM>
860-418-6416

DELAWARE

Criminal Justice Council
<http://www.state.de.us/cjc/drugs.htm>
302-577-8693

DISTRICT OF COLUMBIA

Office for Public Safety and Justice
202-727-9604

FLORIDA

Department of Law Enforcement
<http://www.dca.state.fl.us/>
850-410-7001

GEORGIA

Criminal Justice Coordinating Council
<http://www.ganet.org/cjcc/byrne.html>
404-559-4949

GUAM

Bureau of Planning
<http://www.gov.gu/webtax/govoff.html>
011-671-472-4201

HAWAII

Office of the Attorney General
<http://www.cpja.state.hi.us/gr/byrne98.shtml>
808-586-1150

IDAHO

Department of Law Enforcement
<http://164.165.67.76/dle/oldDle.htm>
208-884-7042

ILLINOIS

Criminal Justice Information
Authority
<http://www.icjia.state.il.us>
312-793-8550

INDIANA

Criminal Justice Institute
<http://www.state.in.us/cji/home/index2.html>
317-232-1230

IOWA

Office of Drug Control Policy
<http://www.state.ia.us/odcp>
515-281-3788

KANSAS

Criminal Justice Coordinating
Council
<http://www.ink.org/public/ksc/SiteMap.htm>
785-296-0927

KENTUCKY

Criminal Justice Council
<http://www.jus.state.ky.us/>
502-564-7554

LOUISIANA

Commission on Law Enforcement
<http://www.cole.state.la.us/>
225-925-4422

MAINE

Department of Public Safety
<http://janus.state.me.us/dps/homepage.htm>
207-287-3619

MARYLAND

Governor's Office of Crime Control and Prevention
<http://www.goccp.org/>
410-321-3521

MASSACHUSETTS

Executive Office of Public Safety
<http://www.state.ma.us/ccj/>
617-727-6300

MICHIGAN

Office of Drug Control Policy
<http://www.mdch.state.mi.us/ODCP/>
517-241-0519

MINNESOTA

Office of Drug Policy and Violence Prevention
<http://www.dps.state.mn.us/DrugPol/>
651-284-3318

MISSISSIPPI

Division of Public Safety Planning
<http://www.dps.state.ms.us/>
601-359-7880

MISSOURI

Department of Public Safety
<http://www.dps.state.mo.us/DPS/DIROFF/grants/narcotics.html#ncap>
573-751-5997

MONTANA

Board of Crime Control
<http://bccdoj.doj.state.mt.us/>
406-444-3604

NEBRASKA

Commission on Law Enforcement and Criminal Justice
<http://www.nol.org/home/crimecom/>
402-471-3416

NEVADA

Department of Motor Vehicles and Public Safety
http://www.state.nv.us/dmv_ps/welcome.htm
775-687-5282

NEW HAMPSHIRE

Department of Justice
<http://www.state.nh.us/nhdoj/>
603-271-7987

NEW JERSEY

Division of Criminal Justice
<http://www.state.nj.us/lps/dcj/index.htm>
609-292-1502

NEW MEXICO

Department of Public Safety
<http://www.dps.nm.org/>
505-827-3424

NEW YORK

Division of Criminal Justice Services
<http://criminaljustice.state.ny.us/>
518-457-8462

NORTH CAROLINA

Governor's Crime Commission
<http://www.nccrimecontrol.org>
919-733-4564

NORTH DAKOTA

Bureau of Criminal Investigation
<http://www.ag.state.nd.us/ndag/default.htm>
701-328-5500

NORTHERN MARIANA ISLANDS

Criminal Justice Planning Agency
<http://www.mariana-islands.gov.mp/cabinet.htm>

011-670-664-4550

OHIO

Governor's Office of Criminal Justice Services
<http://www.ocjs.state.oh.us/>
614-466-4470

OKLAHOMA

District Attorneys Council
<http://www.odawan.net>
405-264-5008

OREGON

Department of State Police
<http://www.osp.state.or.us/html/cjسد.html>
503-378-3725

PENNSYLVANIA

Commission on Crime and Delinquency
<http://www.pccd.state.pa.us/>
717-787-8559, ext. 3064

PUERTO RICO

Department of Justice
<http://fortaleza.govpr.org/>
787-725-0335

RHODE ISLAND

Governor's Justice Commission
<http://www.rijustice.state.ri.us>
401-422-4493

SOUTH CAROLINA

Office of Safety and Grants
<http://www.state.sc.us/dps/ojpd/>
803-896-9702

SOUTH DAKOTA

Office of the Governor
<http://www.state.sd.us/attorney/attorney.html>
605-773-3661

TENNESSEE

Department of Finance and
Administration
[http://www.state.tn.us/finance/rds/
programs.html](http://www.state.tn.us/finance/rds/programs.html)
615-741-8277

TEXAS

Office of the Governor
[http://www.governor.state.tx.us/
CJD/index.html](http://www.governor.state.tx.us/CJD/index.html)
512-463-2285

UTAH

Commission on Criminal and
Juvenile Justice
<http://www.justice.state.ut.us/>
801-538-1031

VERMONT

Department of Public Safety
<http://www.dps.state.vt.us/>
802-244-8718

VIRGINIA

Department of Criminal Justice
Services
<http://www.dcjs.state.va.us/>
804-786-7840

VIRGIN ISLANDS

Law Enforcement Planning
Commission
<http://www.gov.vi/lepc/>
340-774-6400

WASHINGTON

Department of Community, Trade
and Economic Development
<http://www.cted.wa.gov>
360-586-8411

WEST VIRGINIA

Division of Criminal Justice
Services
<http://www.wvdcjs.com/>
304-558-8814, ext. 206

WISCONSIN

Office of Justice Assistance
<http://oja.state.wi.us/static/grants.htm>
608-267-2116

WYOMING

Division of Criminal Investigation
[http://www.state.wy.us/~ag/dci/grants.
html](http://www.state.wy.us/~ag/dci/grants.html)
307-777-6608

Appendix B Resources

Agency/Subagency	Web Address	Telephone
<i>Federal Agencies/Programs:</i>		
DOJ	www.usdoj.gov	800-421-6770
BJA	www.ojp.usdoj.gov/bja	800-688-4252
COPS	www.cops.usdoj.gov	800-421-6770
NCJRS	www.ncjrs.org	800-851-3420
NIJ	www.ojp.usdoj.gov/nij	800-851-3420
DOT	www.dot.gov	202-366-4000
TSA	www.tsa.dot.gov	866-289-9673
FAA	www.faa.gov	202-366-4000
FBI	www.fbi.gov	202-324-3000
CALEA	www.askcalea.net	800-551-0336
NCIC	www.fbi.gov/hq/cjisd/ncic.htm	304-625-2730
FCC	www.fcc.gov	888-225-5322
FEMA	www.fema.gov	202-556-1600
USFA	www.usfa.fema.gov	301-447-1000
GPO (for printed FCC rules)	www.gpo.gov	
NLECTC	www.nlectc.org	800-248-2742
NLECTC-RM	www.nlectc.org/nlectcrm	800-416-8086
NTIA	www.ntia.doc.gov	202-482-7002
TOP	www.ntia.doc.gov/top	202-482-2048
PSWN	www.pswn.gov	800-565-7796
<i>Membership Organizations:</i>		
AASHTO	www.aashto.org	202-624-5800

Appendices

APCO	www.apco911.org	888-272-6911
FCCA	www.fcca.info	202-624-8474
IACP	www.theiacp.org	800-843-4227
IAFC	www.iafc.org	703-273-0911
IMSA	www.imsasafety.org	800-723-4672
NENA	www.nena9-1-1.org	800-332-3911