

San Jose CERT/RACES City-Wide Communications

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CITY OF SAN JOSE

- **Tenth Most Populous U.S. City**
- **180 Square Miles**
- **10 City Council Districts**
- **150+ Neighborhood Associations**
- **Overdue for Large Earthquake**

SAN JOSE RACES (Radio Amateur Civil Emergency Services)

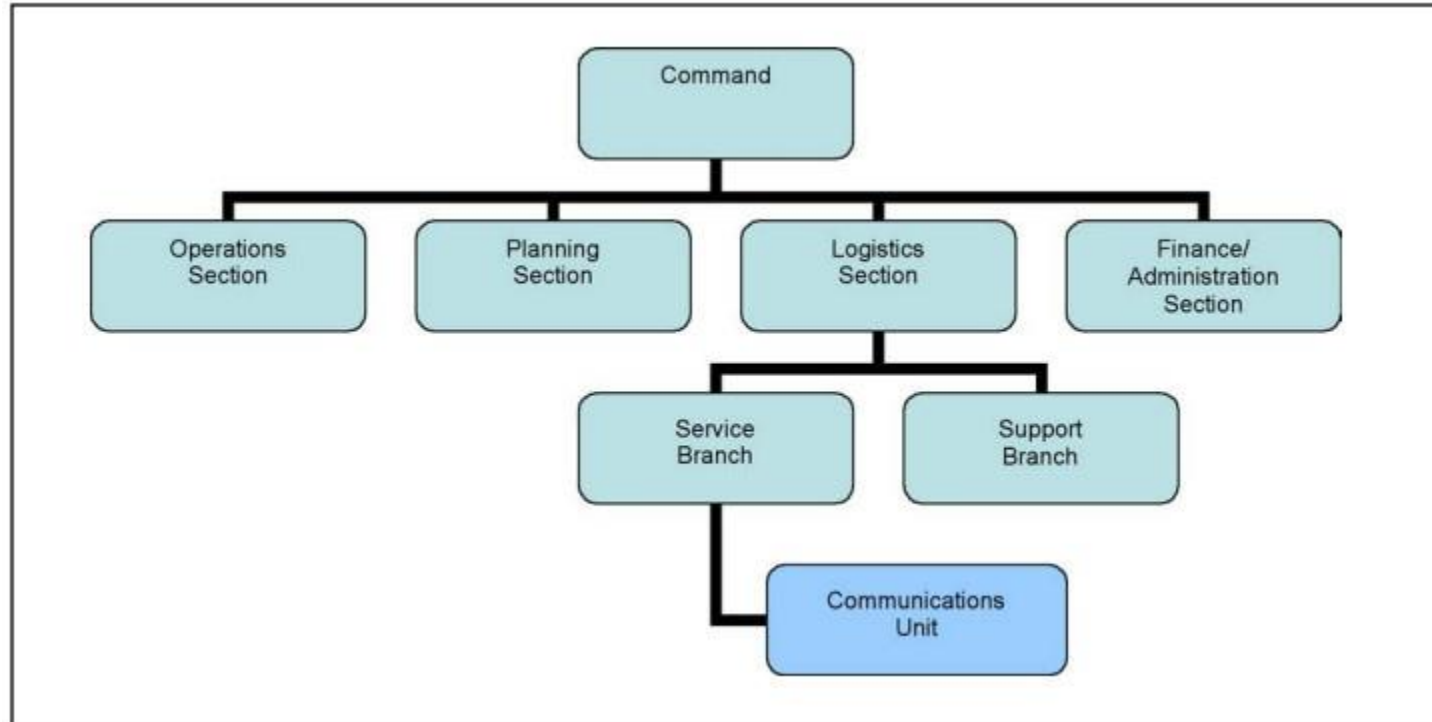
- **Approximately 35 Active Members**
- **All Are Licensed Amateur Radio Operators, Some have GMRS Licenses**
- **Use County Packet Radio for Message Passing**
- **Use Broadband Wireless Emergency Network (WEN) for Data Transfer**

SAN JOSE CERT (Community Emergency Response Teams)

- **Over 300 Active Members, and Growing**
- **Licensed Amateur Radio Operators (“Hams”)**
- **Licensed GMRS (General Mobile Radio Service) Radio Operators**
- **Unlicensed MURS (Multiple Use Radio Service) Radio Operators**
- **Using VARA-FM Data Transfer on Amateur Radio Channels, Readily Accessible by any SJ CERT Group**
- **Actively Training New Members in Multiple Neighborhoods**

NIMS ICS STRUCTURE

- **NIMS = National Incident Management System**
- **ICS = Incident Command System**
- **SJ CERT & SJ RACES Follow this Structure**



LOCATION OF THE COMMUNICATIONS UNIT IN THE ICS ORGANIZATION

NIMS ICS COMMS POSITIONS (Quantities Vary with Incident Size)

- **COML = Communications Unit Leader (Incident Command Planning, Set Up Stations)**
- **COMT = Incident Communications Technician (If Multi-Agency Coordination Needed)**
- **INCM = Incident Communications Center Manager (Large Incidents Only)**
- **RADO = Radio Operator (Net Control Operator, Field Operators)**

NIMS ICS SHARED INFORMATION REPORT DATA FILES

- **Incident Action Plan**
- **Identification of Safety Hazards**
- **Public Information Statements**

NIMS ICS PLANNING & DECISION MAKING REPORT DATA FILES

- **Situation & Status Reports (Who, What, When, Where, & How)**
- **Availability or Assignment of Resources**
- **Public Health Monitoring Data**
- **Environmental Data**

NIMS ICS OPERATIONAL BEST PRACTICES

- **Hierarchical Communications**
- **“Talk Up One (to your supervisor) and Down One (to those you supervise)”**
- **Limit Radio Channel Span of Control to 7 Subordinates**
- **Use Simplex Radio Channels for Tactical Use**
- **Use Repeaters for Supervisory Use Only**

CERT SUPERVISORY VOICE CHANNELS

- **GMRS 725 Repeater Ch. 22 - SJ CERT-1 (City-Wide) @ 400' Elev. Mt. Pleasant Area**
- **GMRS 725 Repeater Ch. 22 - SJ CERT-2 (City-Wide) @ 170' Elev. Willow Glen**
- **GMRS 700 Repeater Ch. 21 - "Zello" (Bay Area) @ 1000' Elev. Near Alum Rock Park**
- **GMRS Simplex Channels (1 or 2 per City Council District)**
- **Business Band Simplex Channels (Campbell)**
- **Share RACES Amateur Radio Repeater and Simplex Channels for Coordination**

CERT LOCAL (Non-Repeater) "TACTICAL" VOICE CHANNELS

- **GMRS Simplex Channels 1 thru 8 (X dozens of PL Tones/Codes)**
- **MURS Simplex Channels 1 thru 5 (X dozens of PL Tones/Codes) – Los Paseos**
- **Business Band Channels 1 thru "n" (X dozens of PL Tones/Codes) – Campbell**
- **UHF VARA-FM Data Channels for Emergency Voice (PL=123.0 Hz)**

CERT/RACES DATA CHANNELS (5 Kbps-25 Kbps)

- **VARA-FM UHF Amateur Channels 1 thru 11 (Most = 100 KHz width)**
- **(1200 Baud Santa Clara County Packet is Used by SJ RACES, but not SJ CERT)**

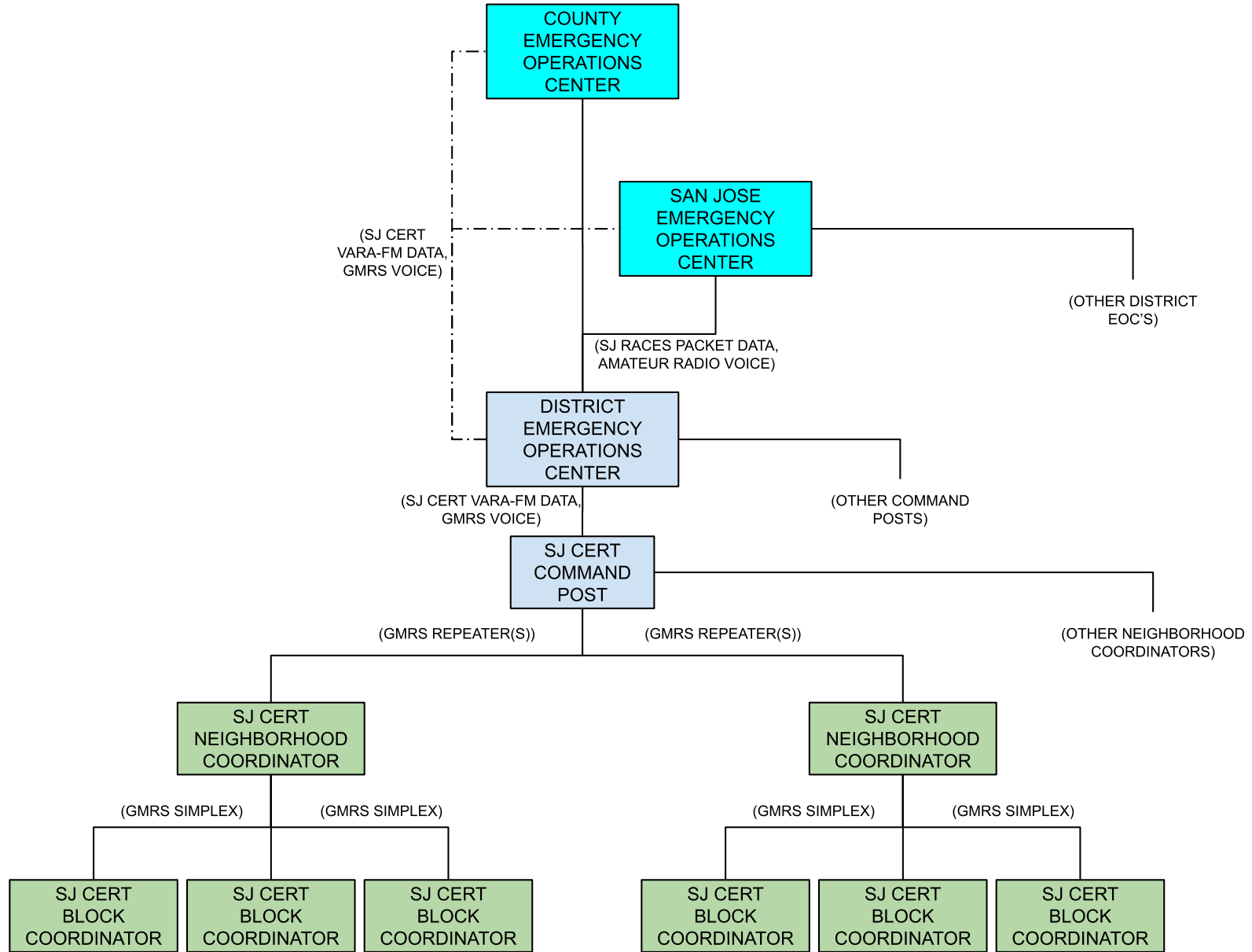
CERT/RACES SUPERVISORY DATA (25 Kbps)

- **433.330 MHz VARA-FM to SJ Emergency Operations Center (EOC) (Future)**
- **433.330 MHz VARA-FM to SCC 70 W. Hedding (Future)**

COMMUNICATIONS HIERARCHY

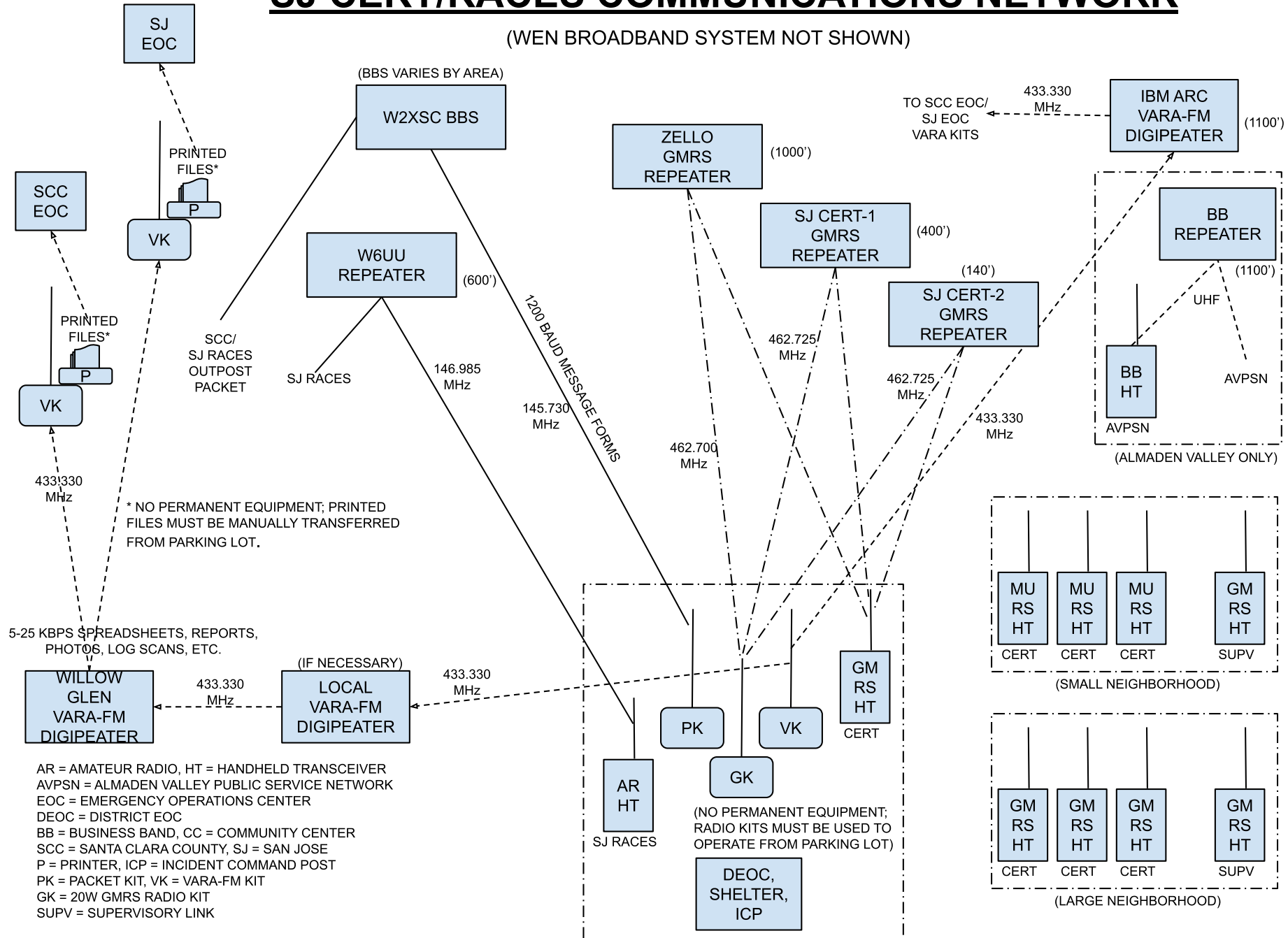
- **SJ RACES Handles Voice & Data from 10 District Emergency Operating Centers (DEOC's) to SJ EOC**
- **SJ CERT Neighborhood Command Posts Use CERT Hams with VARA-FM Wide to Transfer Data Files to DEOC's. SJ RACES Command Posts Use SJ RACES Hams.**
- **SJ CERT Neighborhood Command Posts Supervise Neighborhood Coordinators, using Handheld Transceivers (HT's), Mobile Radios for Voice Traffic**
- **SJ CERT Neighborhood Coordinators Supervise Block Coordinators, using HT's for Voice Traffic**

SJ CERT/RACES COMMUNICATIONS HIERARCHY



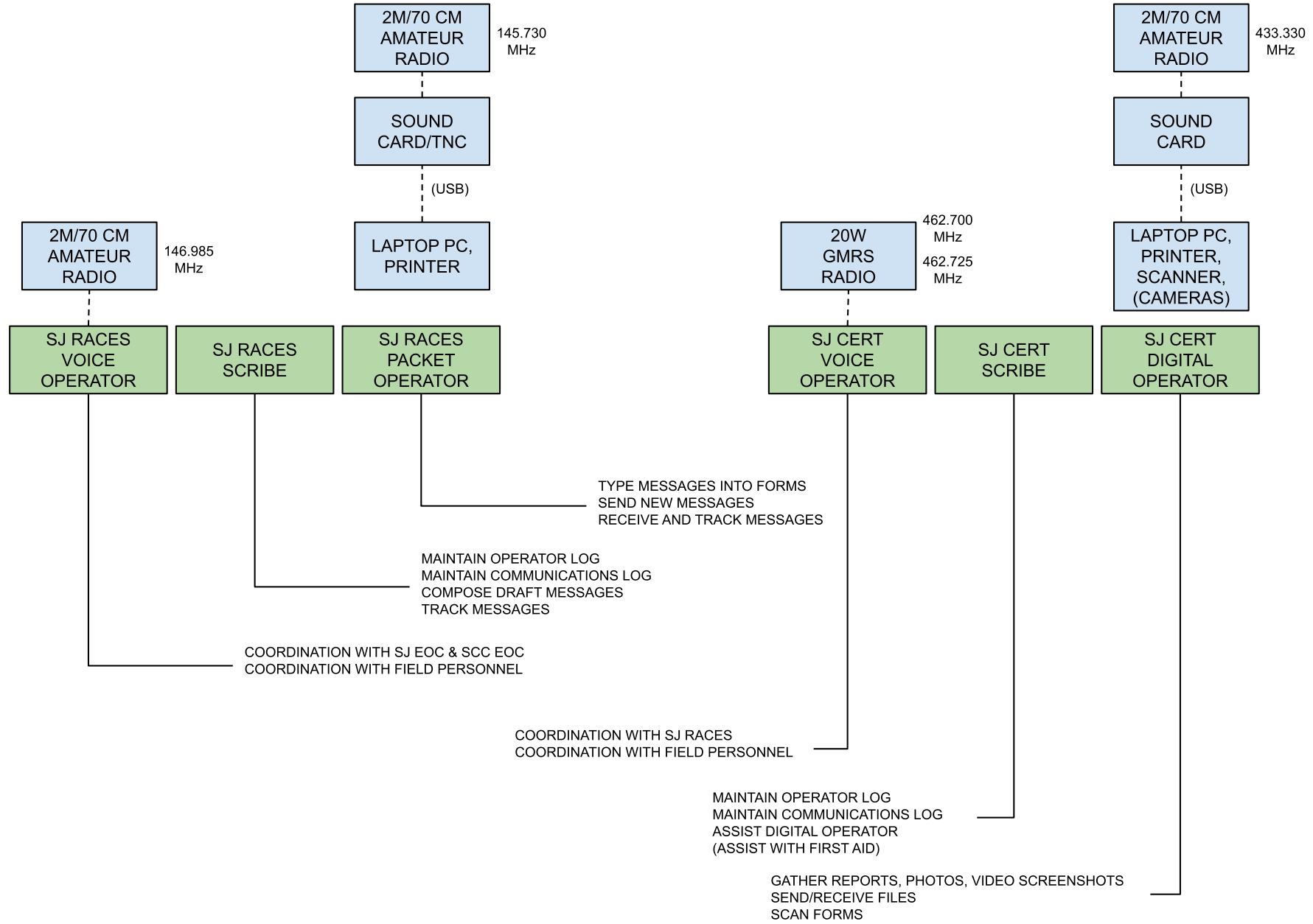
SJ CERT/RACES COMMUNICATIONS NETWORK

(WEN BROADBAND SYSTEM NOT SHOWN)



AR = AMATEUR RADIO, HT = HANDHELD TRANSCEIVER
 AVPSN = ALMADEN VALLEY PUBLIC SERVICE NETWORK
 EOC = EMERGENCY OPERATIONS CENTER
 DEOC = DISTRICT EOC
 BB = BUSINESS BAND, CC = COMMUNITY CENTER
 SCC = SANTA CLARA COUNTY, SJ = SAN JOSE
 P = PRINTER, ICP = INCIDENT COMMAND POST
 PK = PACKET KIT, VK = VARA-FM KIT
 GK = 20W GMRS RADIO KIT
 SUPV = SUPERVISORY LINK

SJ CERT/RACES COMMAND POST STAFFING & FUNCTIONS



DISTRICT AMATEUR RADIO CHANNEL ASSIGNMENTS

LOCATION	CHANNEL	PL/DCS	REMARKS
Council District 1	433.25 MHz	100.0 Hz	VARA-FM 50 W*
Council District 1	433.25 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 2	433.45 MHz	100.0 Hz	VARA-FM 50 W*
Council District 2	433.45 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 3	433.55 MHz	100.0 Hz	VARA-FM 50 W*
Council District 3	433.55 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 4	433.57 MHz	100.0 Hz	VARA-FM 50 W*
Council District 4	433.57 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 5	433.59 MHz	100.0 Hz	VARA-FM 50 W*
Council District 5	433.59 MHz	123.0 Hz	Tactical Voice, 5 W**
	*Leave District EOC Radios on DATA channel, unless necessary to use for Tactical Voice.		**Listen for W6UU and TAC 1,2,3 on HT radios. If all are busy, switch VARA-FM radio to its Tactical Voice channel temporarily.

DISTRICT AMATEUR RADIO CHANNEL ASSIGNMENTS

LOCATION	CHANNEL	PL/DCS	REMARKS
Council District 6	434.85 MHz	100.0 Hz	VARA-FM 50 W*
Council District 6	434.85 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 7	434.95 MHz	100.0 Hz	VARA-FM 50 W*
Council District 7	434.95 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 8	438.40 MHz	100.0 Hz	VARA-FM 50 W*
Council District 8	438.40 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 9	438.60 MHz	100.0 Hz	VARA-FM 50 W*
Council District 9	438.60 MHz	123.0 Hz	Tactical Voice, 5 W**
Council District 10	438.70 MHz	100.0 Hz	VARA-FM 50 W*
Council District 10	438.70 MHz	123.0 Hz	Tactical Voice, 5 W**
	*Leave District EOC Radios on DATA channel, unless necessary to use for Tactical Voice.		**Listen for W6UU and TAC 1,2,3 on HT radios. If all are busy, switch VARA-FM radio to its Tactical Voice channel temporarily.

CITY-WIDE AMATEUR RADIO CHANNEL ASSIGNMENTS

LOCATION	CHANNEL	PL/DCS	REMARKS
City-Wide Channel	146.985 MHz, Neg Offset	114.8 /114.8 Hz	W6UU Voice
City-Wide Tactical Channel	146.475 MHz	100.0 Hz	SJ RACES TAC 1 Voice
City-Wide Tactical Channel	146.430 MHz	100.0 Hz	SJ RACES TAC 2 Voice
City-Wide Tactical Channel	147.435 MHz	100.0 Hz	SJ RACES TAC 3 Voice
County-Wide Channel	146.115 MHz, Pos Offset	100.0 Hz	AA6BT Voice-Santa Clara County
SJ EOC	433.33 MHz	100.0 Hz	VARA-FM 50 W*
SJ EOC	433.33 MHz	123.0 Hz	Tactical Voice, 5 W**
Fire Station 33	433.33 MHz	100.0 Hz	VARA-FM 5 W, Digipeater Only
	*Leave EOC Radio on DATA channel, unless necessary to use for Tactical Voice.		**Listen for W6UU and TAC 1,2,3 on other radios. If all are busy, switch VARA-FM radio to its Tactical Voice channel temporarily.

CITY-WIDE GMRS RADIO CHANNEL ASSIGNMENTS

LOCATION	CHANNEL	PL/DCS	REMARKS
Council District 1	GMRS Simplex Ch. 15	97.4 Hz	50 Watts
Council District 2	GMRS Simplex Ch. 16	100.0 Hz	50 Watts
Council District 3	GMRS Simplex Ch. 17	103.5 Hz	50 Watts
Council District 4	GMRS Simplex Ch. 18	107.2 Hz	50 Watts
Council District 5	GMRS Simplex Ch. 19	110.9 Hz	50 Watts
Council District 6	GMRS Simplex Ch. 20	114.8 Hz	50 Watts
Council District 7	GMRS Simplex Ch. 21	118.8 Hz	50 Watts
Council District 8	GMRS Simplex Ch. 22	123.0 Hz	50 Watts
Council District 9	GMRS Simplex Ch. 15	127.3 Hz	50 Watts
Council District 10	GMRS Simplex Ch. 16	131.8 Hz	50 Watts
SJ EOC	GMRS Simplex Ch. 17	136.5 Hz	50 Watts
City-Wide CALL Channel	GMRS Simplex Ch. 18	141.3 Hz	50 Watts
(Anyone with HT)	GMRS Repeater Ch. 22	114.8 /114.8 Hz	SJ CERT-1 (40W)
(Anyone with HT)	GMRS Repeater Ch. 22	UnPub/114.8 Hz	SJ CERT-2 (40W)

NEIGHBORHOOD GMRS HT RADIO CHANNEL ASSIGNMENTS (Low Power Use Within any Council District)

LOCATION	CHANNEL	PL/DCS	REMARKS
Sector 1	GMRS Simplex Ch. 15	97.4 Hz	5 Watts
Sector 2	GMRS Simplex Ch. 16	100.0 Hz	5 Watts
Sector 3	GMRS Simplex Ch. 17	103.5 Hz	5 Watts
Sector 4	GMRS Simplex Ch. 18	107.2 Hz	5 Watts
Sector 5	GMRS Simplex Ch. 19	110.9 Hz	5 Watts
Sector 6	GMRS Simplex Ch. 20	114.8 Hz	5 Watts
Sector 7	GMRS Simplex Ch. 21	118.8 Hz	5 Watts
Sector 8	GMRS Simplex Ch. 22	123.0 Hz	5 Watts
Sector 9	GMRS Simplex Ch. 15	127.3 Hz	5 Watts
Sector 10	GMRS Simplex Ch. 16	131.8 Hz	5 Watts

NEIGHBORHOOD MURS HT RADIO CHANNEL ASSIGNMENTS

(Smaller Neighborhoods < 1.5 Miles Square)

LOCATION	CHANNEL	PL/DCS	REMARKS
Sector 1	MURS Ch. 1	97.4 Hz	2 Watts
Sector 2	MURS Ch. 2	100.0 Hz	2 Watts
Sector 3	MURS Ch. 3	103.5 Hz	2 Watts
Sector 4	MURS Ch. 4	107.2 Hz	2 Watts
Sector 5	MURS Ch. 5	110.9 Hz	2 Watts
Sector 6	MURS Ch. 1	114.8 Hz	2 Watts
Sector 7	MURS Ch. 2	118.8 Hz	2 Watts
Sector 8	MURS Ch. 3	123.0 Hz	2 Watts
Sector 9	MURS Ch. 4	127.3 Hz	2 Watts
Sector 10	MURS Ch. 5	131.8 Hz	2 Watts

HOW CAN I HELP?

GROUP	VOICE TRAFFIC	MESSAGE TRAFFIC	FILE TRANSFER
SJ CERT Hams	Amateur Radio (AR)/GMRS	AR/GMRS Voice Message Passing	VARA-FM
SJ CERT	GMRS	GMRS Voice Message Passing	
SJ RACES Hams	AR/GMRS	SCC Packet/ AR/GMRS Voice Message Passing	VARA-FM/WEN
Neighborhood Ass'n Hams	AR/GMRS/MURS	GMRS/MURS Voice Message Passing	VARA-FM/ WEN (Possibly)
Neighborhood Ass'n	GMRS/MURS	GMRS/MURS Voice Message Passing	
Scout Hams	AR/GMRS	AR/GMRS Voice Message Passing	VARA-FM
Scouts	GMRS	GMRS Voice Message Passing	

SJ CERT/Neighborhood EMCOMM Amateur Stations

- **AI6EH (John Nourse) Willow Glen – SJ CERT2 GMRS Repeater, VARA-FM Wide**
- **KM6KEG (Jim Frizzell) Mount Pleasant– SJ CERT1 GMRS Repeater**
- **AJ6UC (Brendan Goodman) Naglee Park – VARA-FM Wide**
- **AJ6HU (Wyman Pang) Los Paseos – VARA-FM Wide**
- **KD6IRG (Herb Bowen) Los Paseos – 501C3 Charity Foundation Coordinator**
- **AG6FK (Walter Chang) Almaden Valley – VARA-FM Wide**
- **KM6AMX (Cole Cameron) Cambrian – SJ RACES & Campbell CERT Liaison**
- **KD6SPN (Sherwin Notario) North San Jose – VARA-FM**

MUTUAL AID COORDINATION AVAILABLE VIA GMRS REPEATERS

- **Morgan Hill/Gilroy**
- **Los Gatos**
- **Cupertino**
- **Oakland (GENOAK)**
- **Orinda**
- **Berkeley (BeCertainn)**
- **San Mateo**

VOICE MESSAGE PASSING

- **Any Radio Operator Can Do This!**
- **Structured Procedure and Phonetics Ensure Accuracy**
- **Messages are Short-25 Words Maximum Normally**
- **Messages are Broken into 5-Word Groups**
- **Difficult Words are Spelled Out, e.g., “Deliver them to <pause> figures two three five <pause> I Spell foxtrot alpha yankee street”**
- **Each Punctuation = 1 Word**
- **“Prowords” are used for Radio Traffic Control, e.g., “I Spell,” “Say Again,” “All After,” “Figures,” “Initials,” “Roger,” “Affirmative,” “Negative”**
- **Use Only Plain Language**
- **Transmit Only Facts**
- **No Personal, Confidential, or Sensitive Information, e.g., Phone Numbers, Patient Info, Body Counts**
- **Leave Gaps Between Transmissions to Allow Others to Break In**
- **Ask for Clarification if You Don’t Understand Something**
- **Ask a “Scribe” to Assist You Writing Messages Down**
- **Santa Clara County ARES-RACES has Excellent On-Line Tutorials**

SJ CERT-1 GMRS REPEATER



WEEKLY GMRS RADIO CHECK-INS

Weekly SJ CERT GMRS Check-In Net on CERT 1 Repeater

- **Tuesday 7 p.m.**
- **GMRS Repeater Channel 22, 462.725 MHz, +5 MHz, PL 114.8 Tx/114.8 Hz Rx**

Weekly SJ CERT GMRS Early Check-In Net on CERT 2 Repeater

- **Tuesday 6:50 p.m.**
- **GMRS Repeater Channel 22, 462.725 MHz, +5 MHz, PL 123.0 Tx/114.8 Hz Rx**

Weekly GMRS Network Check-In Net on ZELLO GMRS Network Repeater

- **Saturday 3 p.m.**
- **GMRS Repeater Channel 21, 462.700 MHz, +5 MHz, PL 141.3 Tx/141.3 Hz Rx**

[When Invited, Check In Using Your GMRS Call Sign in Phonetics, then Your Name]

Weekly SJ CERT VARA-FM Check-In, Using VARA Chat

- **Any Time, 24/7, 433.33 MHz**
- **Keyboard-to-Keyboard Message, or Send any File**

WHAT IS VARA-FM??

- **Software Modem – Sends Digital Data on Analog Radios**
- **Used for Sending Photos, Reports, Spreadsheets, Manuals, Site Plans, Forms**
- **Point-to-Point Data Link (Like using Fax Machines) via Amateur Radio**
- **Weak Signal OFDM Modulation for High Speed Data Transfer over Voice Channels**
- **Uses 14 to 116 Orthogonal Audio Carriers based on Path Quality**
- **Groups of Carriers = “Symbols”**
- **Symbol Rate = 42/Sec**
- **Different from Packet, where 1 Bit = Symbol**
- **4PSK (566 bps) to 256QAM (25,210 bps)**
- **VARA Ramps Speed Up as Path Quality Remains Good**
- **Most Efficient for Large File Transfer**
- **Needs Digital Sound Card Interface for Radio (Tx/Rx Audio + PTT) and USB for PC**
- **Only Works with Windows**
- **Not Packet – Not AX.25 Protocol, No TNC, No Shared Packet/VARA Channel**
- **Digipeater Operation (Store-and-Forward) at Half-Throughput**
- **Listen Before Transmit – No Shared Channel Operation on Same PL Tone/Code**
- **Built-In “Ping” and “Calibrate” Functions for Link Testing**

VARA-FM FOR “FIRST ON-SCENE” Response:

- **All you need is your existing mobile amateur radio and soundcard packet kit**
- **Just use free VARA-Chat and VARA-FM software instead of Outpost**

SIMPLE OPERATION:

- **Use VARA Chat to connect with VARA Portable Station outside EOC**
- **Select “Send File” and point to the thumb drive the Incident Commander hands you**
- **Click “OK”**

VARA-FM LIMITATIONS:

- **No Group Sessions, Point-to-Point (P2P) only**
- **Uni-Directional Message Transfer, (Send Only, Like a FAX Machine)**
- **No “Drop-Box” File Transfer for Other Stations to Retrieve**

WHY NOT USE WINLINK VARA-FM?

- **Winlink adds Layers of Complexity, Incompatible with VARA Chat**
- **Winlink Requires Internet for Updates every 1-2 Weeks**
- **Winlink Radio Only Peer-to-Peer Traffic Requires Advance System Configuration**
- **Winlink E-Mail is Not Useful for County-Wide Operations Only**
- **VARA Chat is Far Simpler, Better for Easy Setup in Emergency Situations**

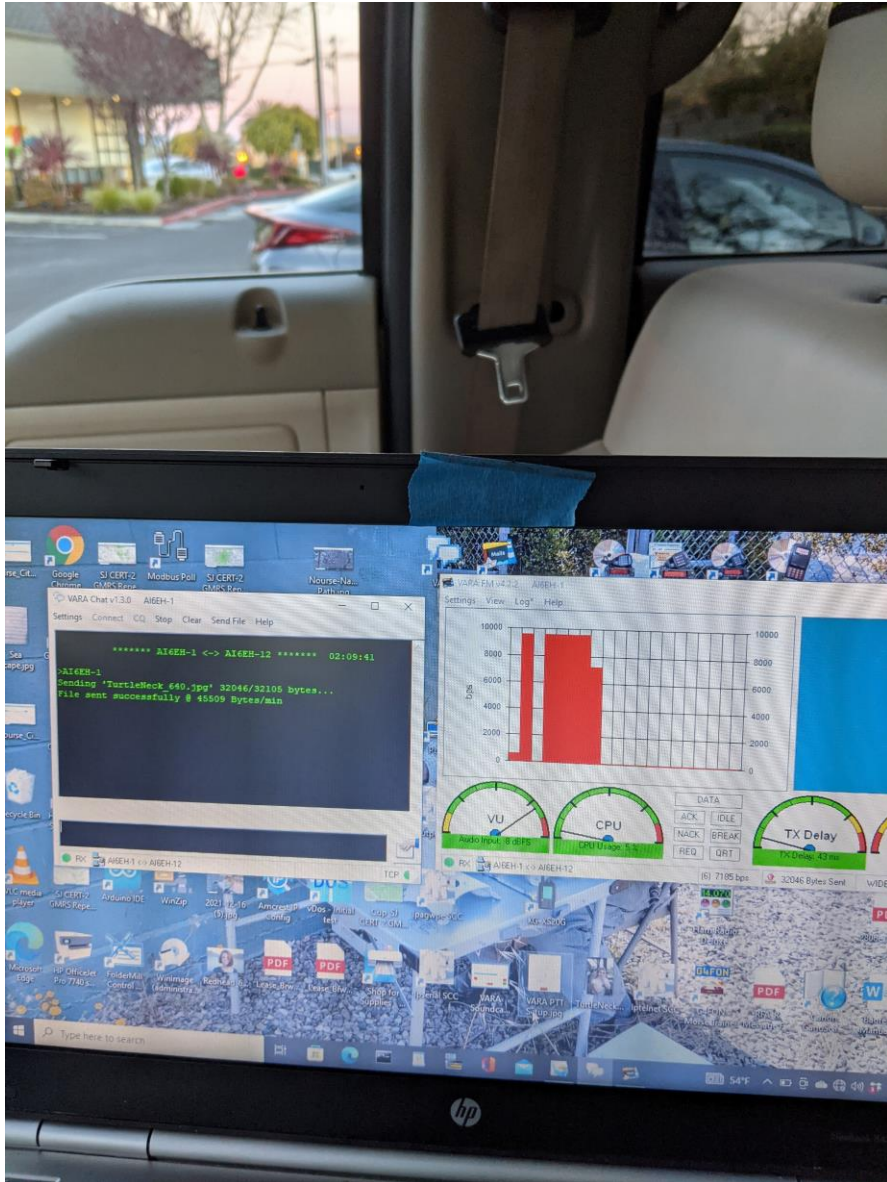
VARA-FM DATA FILE EXAMPLES:

- **Damage Assessment Form**
- **Incident/Assignment Tracking Log**
- **Victim Treatment Area Record**
- **Emergency Shelter Situation Report sent to Command Post**
- **Command Post Situation Report sent to DEOC**
- **DEOC Situation Report sent to SJ EOC**
- **ICS-213 General Message Spreadsheet**
- **Request For Assistance/Resources Spreadsheet**
- **Emergency Supplies Inventory Spreadsheet**
- **Scanned Handwritten Communications Log**
- **Scanned Handwritten Unit Log**
- **Scanned Handwritten ICS-214 Check-In Log**
- **Scanned Building Layout**
- **Scanned Site Map/Parking Layout**
- **Surveillance Video Screenshots**
- **Photos of Lost Children, Flood Stage Readings, Accidents**

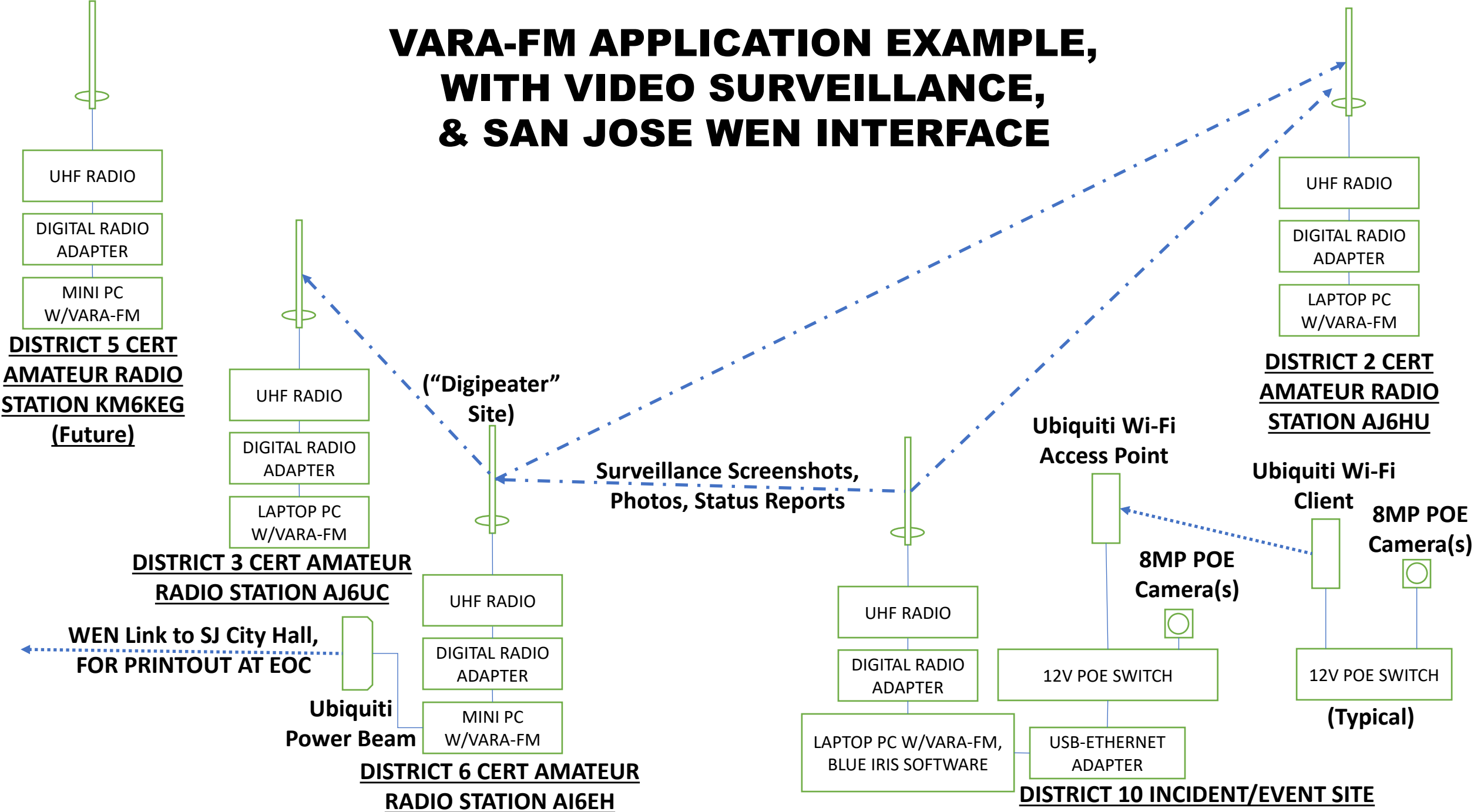
CERT DIGITAL OPERATOR:

- **One Required per Command Post**
- **Must be Licensed Ham Radio Operator**
- **Sets Up & Operates VARA-FM Station**
- **Sets Up & Operates Video Surveillance Camera(s) & Laptop PC**
- **Sets Up & Operates Document Scanner**
- **Takes and Edits Screenshots from Surveillance Software**
- **Assists with Spreadsheet/Report Preparation**
- **Coordinates with SJ RACES for Reporting to DEOC's and SJ EOC**
- **Assists Other CERT Team Members with First Aid Support as Top Priority**

VARA-FM PARKING LOT FIELD-TESTING & COMMAND POST KIT



VARA-FM APPLICATION EXAMPLE, WITH VIDEO SURVEILLANCE, & SAN JOSE WEN INTERFACE



FIELD DAY 2022 SJ RACES VIDEO OPERATIONS AT VHF/UHF STATION



(MOBILE WHIP ANTENNA IS ON TOP OF LADDER)



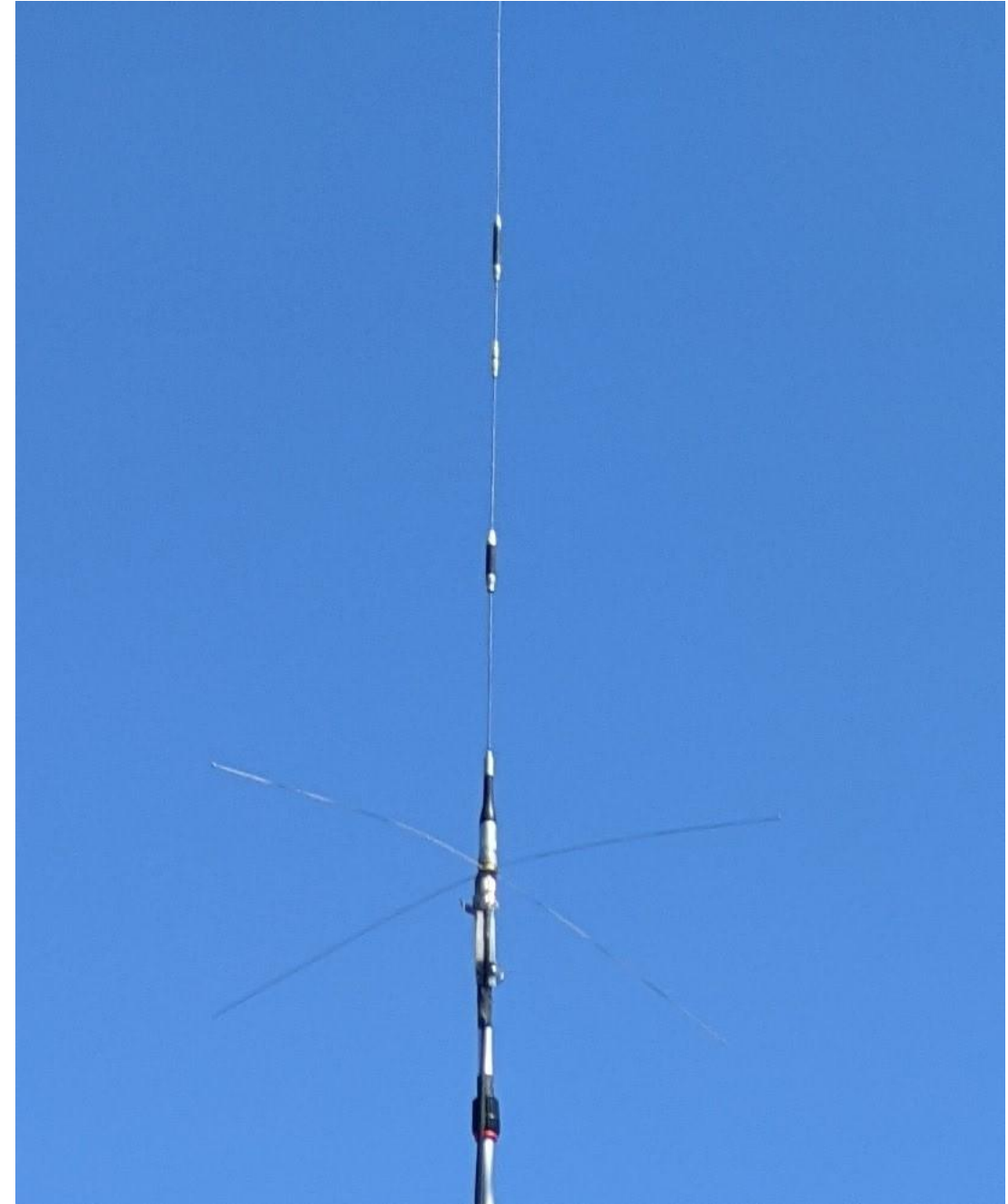
JULY 4TH 2022 SJ RACES VIDEO OPERATIONS - ALMADEN LAKE PARK



SPEAKER STAND TRIPOD & PAINTER'S POLE ANTENNA MAST



ADDING GROUND PLANE ADAPTER TO MOBILE ANTENNA

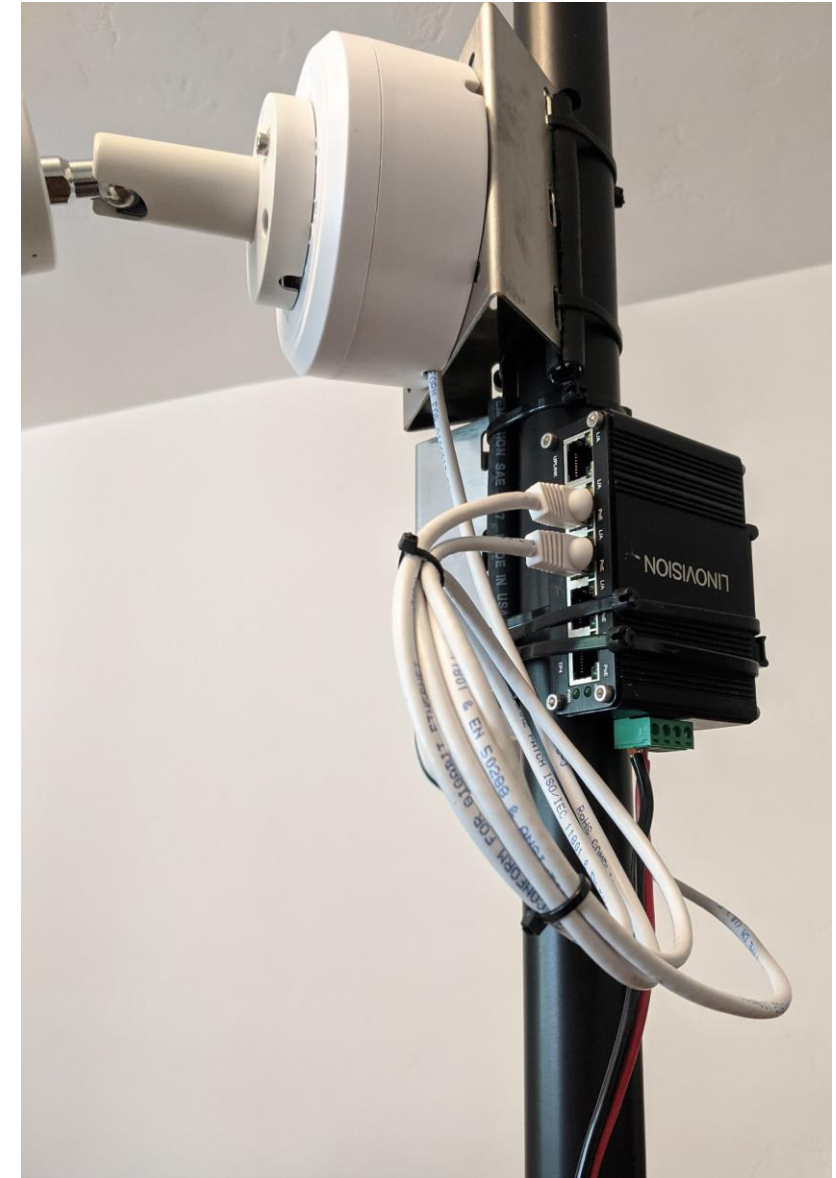


VIDEO CAMERA TRIPOD, WITH 8 MP CAMERAS & 12VDC POE SWITCH



**(POE SWITCH PROVIDES
UP TO 57V TO CAMERAS)**

**(TRIPOD IS ULTIMATE
SPEAKER STAND.
EXTENDS TO 8')**



CROPPED SCREENSHOTS – LOS PASEOS PICNIC



288 KB



**118 KB
(About 2
minutes to
send file
with VARA-
FM)**

SAN JOSE WIRELESS EMERGENCY NETWORK (WEN)

- **Broadband 5.8 GHz Ubiquiti Equipment (Unlicensed, Spread-Spectrum)**
- **Mix of Point-to-Point and Point-to-Multipoint**
- **Access Points at SJ City Hall, Los Gatos Hills, Evergreen, Fire Station 33**
- **Links to Red Cross, County EOC, IBM Research, NASA EOC**
- **Radios use Digital Signal Processing (DSP) for Multipath Optimization**
- **Radios allow Data Encryption, Unlike Amateur Radios; Useful for Medical Data**
- **High Bandwidth Allows Live Video Transmission**

WEN LIMITATIONS

- **5.8 GHz Band is Growing Congested**
- **Some Access Points are “Hidden Nodes” due to Co-Channel Interference (CCI) from other Users on Overlapping Bands**
- **Needs Line-Of-Sight Radio Paths**
- **Limited Number of Access Point Radios**
- **Not Usable in All Areas**
- **Not Practical for “First on Scene” Portable Access due to Tall Mast & Dish Stored in Locked Shipping Container at SJ EOC**
- **Access Point Radios are Single Point of Failure**
- **Some Radios Require Tower Climber to Replace**
- **VARA-FM Recommended for Backup**

CITY-WIDE SYSTEM IMPLEMENTATION IDEA – Cupertino ARKs

- **Shipping Containers Distributed in Districts**
- **Congregating Points for First Responders**
- **Sources of Emergency and Minor First Aid for Community**
- **Caches of Emergency Supplies – Generators, Lights, Radios, Tools, Batteries, Maps, Forms, CERT Team Medical Supplies**

CITY-WIDE SYSTEM IMPLEMENTATION IDEA – Fire Station Radio Rooms

- **GMRS & Amateur Base Station Radios**
- **Rooftop GMRS & Amateur Antennas Connected to Radio Room**
- **Always Attended 24/7**

CITY-WIDE SYSTEM IMPLEMENTATION IDEA – DEOC Radio Rooms

- **VARA-FM Amateur Base Station Radio**
- **Rooftop Amateur Antenna Connected to Radio Room**

SF BAY AREA-WIDE SYSTEM IMPLEMENTATION PLANS

- **VARA-FM Station at Chabot Science Center in Oakland Hills to cover Marin County to San Jose, and All Cities in Between**
- **VARA-FM Station at IBM Advanced Research Facility Tower in Santa Teresa Hills to cover San Jose and Almaden Valley**

SF BAY AREA-WIDE SYSTEM BENEFITS

- **Other Cities may have Relocation Space for Displaced Families & Large Animals**
- **Other Cities may have Working Internet to Forward FEMA Status Reports, etc.**
- **Other Cities may have Additional Resources and Supplies**
- **Other Cities may have More Time to handle File Transfer Traffic**

COMMUNICATIONS EDUCATIONAL OPPORTUNITIES

- **SCC-ARES-RACES On-Line Self-Study Courses**
- **July 4 Almaden Lake Event – Combined SJ CERT / SJ RACES**
- **Quarterly SCC Communications Drills**
- **Invite Other Cities to Check in Weekly by VARA-FM TO SJ RACES SIMPLEX NET**
- **Invite Other Cities to Check in Weekly by VARA-FM TO SJ CERT NET**
- **You-Tube VARA-FM Instructional Videos**

COMMUNICATIONS CHALLENGES

- **Almaden Valley CERT Needs WEN Client Radio at Almaden Community Center**
- **Los Paseos Neighborhood Association Needs WEN Access Point Radio at IBM Advanced Research Facility (ARF) Tower**
- **Los Paseos Neighborhood Ass'n Needs Permanent, Portable WEN Client Radios**
- **No list of DEOCs has been Published**
- **No DEOCs Have Provisions for Amateur Emergency Radios or Antennas**
- **City Electricians are the Most Expensive, and No Current Budget for EMCOMM**
- **No Fire Stations Have Provisions for Amateur Emergency Radios or Antennas**
- **No Fire Stations Have Provisions for GMRS Emergency Radios or Antennas**
- **Need VARA-FM Digipeater Station at IBM ARF Tower or Fire Station 33**
- **Plan On Setting Up Mobile/Portable VARA-FM in EOC, DEOC Parking Lots**

EQUIPMENT RECOMMENDATIONS

- **Radios must have “Split-Tone” Capability, & Must be Programmable for Two Repeaters on Same Frequency. Excludes BTECH GMRS-50X1, Midland MXT500**
- **GMRS Handheld Transceiver (HT) : Wouxun KG-805G, or any Weather-Resistant FCC Part 95E HT (e.g., NOT Baofeng UV-5R)**
- **GMRS HT Antenna : Nagoya NA-771G**
- **GMRS Mobile/Base Station Radio : Wouxun KG-1000**
- **GMRS/MURS Mobile Antenna : Nagoya NMO-200C**
- **GMRS/MURS Mobile NMO Magnetic Mount : MFJ-335BM, with Cable**
- **MURS HT : BTECH MURS-V1, or any Weather-Resistant FCC Part 95E MURS HT**
- **GMRS/MURS Portable Antenna : N9TAX Roll-Up Slim Jim J-Pole with 16’ Cable**
- **VARA-FM (Amateur 2m/70cm) Base Station Antenna : Diamond X-50**
- **VARA-FM (Amateur 2m/70cm) Mobile Antenna : Diamond SG7900A**
- **VARA-FM (Amateur 2m/70cm) Mobile Antenna Mag-Mount : MFJ-335BM, with Cable**
- **VARA-FM (Amateur 2m/70cm) Base Station Radio : Kenwood TM-D710, or any Yaesu, ICOM Radio with Data Port for Direct Connection to FM Discriminator**

RADIO LICENSING

- **GMRS: License Required. \$35 for 10 Years Family License**
- **Amateur: Technician Class OK for VHF/UHF, Voice & Digital Modes**

NEIGHBORHOOD COMMAND POST HOME STATION EQUIPMENT

- **2m/70cm Base Station Radio, with Dual Controls**
- **2m/70cm Base Station Antenna (or Mobile Antenna with Ground Plane Kit)**
- **DC Power Supply**
- **Anderson PowerPole Connectors on all DC Powered Equipment**
- **Antenna Feedline and Lightning Arrestor**
- **USB Digital Radio Adapter for VARA-FM**
- **Laptop PC for VARA-FM**
- **VARA-FM Software**
- **VARA Chat Software**
- **Optional VARA-FM License for Wide Operation (Over 9600 bps) – \$70**
- **MURS HT (Los Paseos)**
- **MURS/GMRS J-Pole Antenna for MURS (Los Paseos)**
- **GMRS Base Station Radio**
- **MURS/GMRS J-Pole Antenna for GMRS**

NEIGHBORHOOD MOBILE EQUIPMENT

- **GMRS Base Station Radio**
- **Anderson PowerPole Connectors on all DC Powered Equipment**
- **MURS/GMRS Mag-Mount Antenna for GMRS**
- **MURS HT (Los Paseos)**
- **MURS/GMRS Mag-Mount Antenna for MURS (Los Paseos)**

NEIGHBORHOOD FIELD COMMAND POST EQUIPMENT

- **GMRS Base Station Radio**
- **35 Amp-Hour Gel Electrolyte Battery**
- **Anderson PowerPole Connectors on all DC Powered Equipment**
- **MURS/GMRS Mobile Antenna for GMRS, with Ground Plane Kit**
- **Tripod, 24' Painter's Pole Telescoping Mast, Antenna Feedline**
- **MURS HT (Los Paseos)**
- **MURS/GMRS Mobile Antenna for MURS, with Ground Plane Kit (Los Paseos)**
- **Table, Chairs, Shade Structure, Clipboard, Forms.**
- **Set up for Radio Operator + Scribe for Logging.**

NEIGHBORHOOD PEDESTRIAN EQUIPMENT

- **GMRS HT**
- **MURS HT (Los Paseos)**

PARKING STRUCTURE LOCATIONS (For Setting up Temporary Command Post, VARA-FM Digipeater, or Wi-Fi Hotspot on Rooftop)

LOCATION	ADDRESS	FLOORS	REMARKS
East Los Gatos-Good Samaritan Hospital Parking Structure (Samaritan Drive @ Hwy 87)	2589 Samaritan Drive, Los Gatos	4	Commanding Views all around! Vertical clearances low driving up.
West SJ-Courtyard Marriott (Hamilton/@ Hwy 880)	655 Creekside Way, Campbell	7	Commanding Views all around! Vertical clearances low driving up.
North SJ-Hyatt House San Jose/Silicon Valley	75 Headquarters Drive, San Jose	5	Vertical clearances low driving up.
South SJ-Kaiser Hospital Santa Teresa	250 Hospital Parkway, San Jose	5	Vertical clearances low driving up.
Downtown SJ-Market & San Pedro Square Parking	N. San Pedro @ St. John, San Jose	6	Used for Veterans Day Cross-Band Repeater. Do Not Leave Equipment Unattended!

RESOURCE: <https://scc-ares-races.org>

- **Go-Bag & Station Equipment Recommendations**
- **Message Passing**
- **Net Control Operation**
- **Forms**

RESOURCE: <https://rosmodem.wordpress.com> (EA5HVK)

- **VARA-FM Software (Free)**
- **VARA Chat Software (Free)**

RESOURCE: <https://masterscommunications.com>

- **DRA-50 USB Interface to Radio for VARA-FM**
- **Cable from DRA-50 to Radio**

RESOURCE: <https://www.fcc.gov/wireless/support/universal-licensing-system-uls-resources/applying-new-license-universal-licensing>

- **GMRS Family License**

AMATEUR RADIO INTRODUCTORY GUIDE

- **Ham Radio for Dummies:** https://www.amazon.com/Ham-Radio-Dummies-Ward-Silver/dp/1119695600/ref=sr_1_1?keywords=ham+radio+for+dummies&qid=1636940959&sr=8-1

AMATEUR RADIO LICENSING RESOURCES

- **Study Guide:** <https://www.kb6nu.com/wp-content/uploads/2018/11/2018-no-nonsense-tech-study-guide-v1-1.pdf>
- **Practice Exams:** <https://hamexam.org/>

RADIO LICENSING EXAM

- **MIT Radio Exam Team, Fully Remote Amateur Radio Exams:** <http://w1mx.mit.edu/ham-exams/>