

**SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

370



FROM: Riverside County Information Technology Department

SUBMITTAL DATE:
July 6, 2011

SUBJECT: PSEC Omnibus Report

RECOMMENDED MOTION: Receive and file the attached PSEC Omnibus Report

BACKGROUND:

PROJECT BUDGET STATUS

In 2005, the County began the process of replacing its current public safety radio system by establishing the Public Safety Enterprise Communication (PSEC) Project Team (Sheriff, Fire and RCIT staff) and the PSEC Project Steering Committee (consisting of the Sheriff's Department, Fire Department, Facilities Management, RCIT and the Executive Office). In 2007, the County entered into a contract with Motorola to design and install a new radio system that would provide 95% coverage countywide. The County also established a project budget of \$148.3 million. Once implemented, the PSEC system will be the first system in the nation that utilizes multiple frequencies, including 700MHz, 800MHz, VHF and the latest in Motorola land mobile radio technology.

(CONTINUED)

Nathan Colodney
Nathan Colodney,
Chief Information Officer

FINANCIAL DATA

Current F.Y. Total Cost: \$ N/A
Current F.Y. Net County Cost: \$ N/A
Annual Net County Cost: \$ N/A

In Current Year Budget:
Budget Adjustment:
For Fiscal Year:

SOURCE OF FUNDS: N/A

Positions To Be Deleted Per A-30
Requires 4/5 Vote

C.E.O. RECOMMENDATION:

APPROVE

CEO letter and supplemental staff report are attached.

BY: *Christopher M. Hans*

County Executive Office Signature Christopher M. Hans

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Buster, seconded by Supervisor Ashley and duly carried, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Buster, Stone, Benoit and Ashley
Nays: None
Absent: Tavaglione
Date: July 12, 2011
xc: RCIT, E.O.

Kecia Harper-Ihem
Clerk of the Board

By: *Michelle Guster*
Deputy

Departmental Concurrence

Policy

Consent

Dept Recomm.:
Per Exec. Ofc.:

June 14, 2011

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SUBJECT: PSEC Enhanced Coverage Sites Detail Design and Contract Amendments

BACKGROUND: (Continued)

The Board of Supervisors, Executive Office, Sheriff's Department, County Fire, Riverside County Information Technology (RCIT), EDA/Facilities Management, and key stakeholders made a commitment to resolving the County's 800 MHz radio coverage challenges.

The Board of Supervisors approved a Program Environmental Impact Report (PEIR) for the project on September 2, 2008. The PEIR imposed a number of standard mitigation measures that were applicable to all of the sites. However, at the time of the PEIR's adoption, certain design details and a final location for a number of the sites had not been finalized. To provide for such a contingency, the PEIR prescribed mitigation measures to be implemented if a site or its supporting components (access roads, power alignments, etc.) were to be relocated to an area that had not been assessed and/or surveyed as part of the PEIR. This programmatic approach was adopted to allow modifications and expansion of the project's design without the need for recirculation of the PEIR. Specific measures prescribed in the PEIR required the County to determine if the impacts associated with the proposed modification/addition were consistent with the analysis and findings of the PEIR. Specific performance measures were adopted to identify the analysis necessary to make this determination.

Subsequently, the Board approved the PSEC detail design and system implementation on March 31, 2009 (MO 3.33). At the end of the detail design for the original communication sites the County received a new coverage prediction map. The predicted coverage was less than the geographic coverage expected by the County. The areas of concern included some highly traveled roads and highways. Motorola and the County negotiated an agreement to add additional sites that would increase the geographic coverage in the areas lacking radio coverage. As part of the agreement Motorola would be responsible for providing the radio equipment and engineering services for these sites. The County would acquire the sites; perform all environmental assessments; provide commercial power and road grading. The integration of the additional sites into the original group of sites is known as the Enhanced Coverage. As such, the County undertook to implement the mitigation prescribed in the PEIR that was required in the event of site relocation and/or network expansion. Pursuant to CEQA Section 15164, the attached addendum to the PEIR was prepared.

On March 31, 2009 the Board also approved the development of the detail design for the enhance coverage - and directed the PSEC Team to return to the Board for approval to proceed with integrating the enhanced coverage sites into the PSEC implementation. The Enhanced Coverage will include the proposed sites listed below located in more remote/ unique areas of the county. When implemented, these sites will increase coverage throughout the county. If approved, the additional proposed sites would be fully implemented by January 2013.

Following is a list of the proposed Enhanced Coverage Sites and the general vicinity where they will provide additional coverage:

1. Billy Goat; will provide coverage in the Sage, Anza Cahuilla IR, HWY 79 and Hwy 371 area.
2. Box Canyon; will provide primary coverage along Box Canyon Road in the City of Mecca.
3. Lake Hemet; will provide coverage in the Lake Hemet campgrounds, Garner Valley, Hurkey Creek Park and surrounding trails and campgrounds.

4. Midland; will provide coverage in the Midland areas.
5. Palen McCoy; will provide coverage in the Palen McCoy area.
6. Palo Verde; will provide coverage in the southeastern portion of the county.
7. Road 62; will provide coverage in the HWY 62 at Road 177 and surrounding areas.
8. Toro Peak; will provide coverage in the Santa Rosa mountains.
9. Snow Peak; will provide coverage in at San Jacinto Peak, HWY 243 and nearby valleys and canyons.

Approval of the implementation of Enhanced Coverage sites will require an expenditure of \$1.7 million for land acquisition activities.

The annual operational cost for these proposed sites is estimated at \$709,000 and will be incorporated into the new FY12/13 radio system operation support costs (backbone costs) paid by the user departments.

The Steering Committee recommends approval of Enhanced Coverage sites to provide portable radio coverage to the greatest degree possible achievable throughout Riverside County.

Project Schedule

EC Milestones	Planned Start	Planned Completion
Site Acquisition	Dec 2008	May 2011
Civil A&E	Aug 2009	May 2011
Complete Site Construction	Jun 2010	Dec 2011
Equipment Installation	Mar 2011	May 2012
Complete Acceptance Testing	Jun 2011	Aug 2012
Complete Implementation	Oct 2011	Dec 2012
Final Acceptance	Feb 2012	January 2013

June 14, 2011

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SUBJECT: PSEC Enhanced Coverage Sites Detail Design and Contract Amendments

Summary:

The members of the PSEC Executive Steering Committee and the PSEC Project Team have worked diligently to finalize a design that will meet all the operational needs of the departments, and remains committed to completing all aspects of the project within the budget and timelines. The PSEC Project Team will continue to provide bi-monthly status reports and quarterly updates to the Board on the project.



Bill Luna
County Executive Officer

Jay E. Orr
Assistant County Executive Officer

Executive Office, County of Riverside

The Honorable Board of Supervisors
County of Riverside
Robert T. Anderson Administrative Center
4080 Lemon Street, 5th Floor
Riverside, California 92501-3651

June 28, 2011

Subject: PSEC Project

Board Members:


In the Mid-Year Budget Report, I presented the concerns of the Executive Office with respect to the PSEC project and the growth of the original project scope. I directed the Information Technology department to prepare an overview of the PSEC project with full disclosure of the project status and cost impacts. That report is before you today, as well as a supplemental Staff Report from my office.

The project now has exceeded the original cost and scope. However, our cash on hand appears to be close to fund the project up to its completion date, which is projected to be in January 2013. We have identified other sources to offset the cost of system enhancements.

Although the Board has already made a significant investment in the PSEC project, we now must plan for funding operations. Modifications to the long-range budget starting in fiscal year 2012-13 may be needed to fund six months of the PSEC operating budget, as well as its ongoing operations of roughly \$13 million going forward.

As with all other budget priorities, the Board maintains the discretion to earmark funds to sustain the PSEC project. Those will be forthcoming in the FY 2012/13 budget process.

Respectfully Submitted,



Bill Luna
County Executive Officer



MEMORANDUM

EXECUTIVE OFFICE, COUNTY OF RIVERSIDE

Bill Luna

County Executive Officer

Jay E. Orr

Assistant County Executive Officer

EXECUTIVE OFFICE SUPPLEMENTAL STAFF REPORT PSEC PROJECT

July 7, 2011

Executive Office staff performed a detailed analysis of the PSEC project budget status of the original PSEC obligation of \$148,300,000 before confirming the financial impacts of the remaining project costs in Table 1 of the PSEC Budget and Contract Amendments F-11, as submitted by the Department. Staff has reviewed F-11 and has found that:

- The PSEC Team did not prepare a detailed accounting of the current budget status to determine the actual contingency balance.
- Staff has calculated the revised PSEC budget to be \$154.4 million, based on a detailed accounting of the current budget status and the remaining project expenses provided by the PSEC Team. This does not include the potential additional cost of \$4.9 million in contract changes, currently under negotiation.
- The net cost over the original PSEC budget appears to be about \$6 million, with a potential additional cost of \$4.9 million in contract changes, currently under negotiation.
- NCC for the PSEC operating budget was reduced for FY 11-12. The PSEC contingency will be used to "backfill" \$4,000,000. This was not included in the remaining draws on contingency.
- No NCC is budgeted for the PSEC operating budget in FY 12-13. The PSEC contingency will be used to fund \$2,000,000 towards the PSEC operating budget in FY 12-13 until project completion in January 2013. This was not included in the remaining draws on contingency. No funds have been identified for the remainder of the PSEC operating budget for FY 12-13.
- Staff has calculated cash on hand within the range to completely fund the PSEC project up to January 2013.
- There are still unknown, unfunded costs for the six months PSEC operating budget in FY 12-13. A source of funding will need to be identified for the remaining six months of PSEC operations in FY 12-13.
- PSEC debt service has been budgeted in the FY 11-12 budget; however, funding for the \$13,000,000 ongoing PSEC operating costs has not been identified. The majority of costs are for public safety departments. This is an increase in NCC needed.

**Public Safety Enterprise Communications
(PSEC)
Project Status Report**



PUBLIC SAFETY ENTERPRISE COMMUNICATION

*Creating the Next-Generation Communication System
To Better Serve the County of Riverside.*

June 2011

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OVERVIEW

The following is an omnibus report of the Public Safety Enterprise Communication (PSEC) project from its origination, to current status, and projected completion. This report contains a chronology of Board actions. Other discussion items include the current status of the project budget and updated project schedule, with the anticipated implementation date.

The PSEC project is a cooperative effort Riverside County Sheriff, Riverside County Fire, Riverside County EDA, Executive Office, and Riverside County Information Technology – the project lead agency. Motorola is the vendor contracted both to provide equipment and to integrate the system. The PSEC Steering Committee includes representation from each of the county departments involved in the project and meets monthly to review project activities, provide direction, and authorize expenditures within approved budget.

On September 27, 2005 (M.O. 3.44a, b & c), the Board took action on three items:

- 1) The Board established the PSEC Project Team and authorized funding for the team's administrative and operational expenses to complete the RFP evaluation, select a vendor, negotiate and award a contract, and implement the new radio system
- 2) The Board approved a sole source legal service to support the evaluation, contract development and negotiations for the project. The Board also approved a contract amendment for RCC Consulting to augment staff support for the completion of the RFP evaluation and contract negotiations
- 3) The Board granted in-principle approval to seek lease space in the City of Riverside for the project team

On January 30, 2007 (M.O. 3.42b), the Board of Supervisors approved the agreement with Motorola Inc, in the amount of \$104,438,000; established the project start date as March 7, 2007; directed the project team to present the final design plan for the system with documentation demonstrating CEQA compliance, and, authorized EDA/Facilities Management to initiate in-principle efforts to acquire the sites and easements. The original Motorola timeline was 44-months to complete.

The project budget was established as follows:

Vendor Contract	\$104.4M
Land Acquisition	\$8.6M
Contract and Land Contingency (10%)	\$11.3M
PSEC Team Operations (4 yrs)	\$24M
Estimate of Total System Cost	\$148.3M

In the time since the Motorola contract was first approved, the vendor and PSEC Project Team have faced numerous unexpected challenges. Foremost has been the difficulties encountered when negotiating with government entities to either lease or purchase essential sites to place new radio towers. The project continues to make progress while working through identified risks, such as acquiring commercial power from SCE and the smaller power providers within the county. Other risks include environmental compliance; there are nesting bird surveys to contend with, Multiple Species Habitat Conservation requirements, paleontology and archeological assessment; tribal consultations, and National Environmental Policy Act. Another high risk item is site acquisition covered later in this report. The greatest challenge is working through acquisition requirements of the Federal Agencies.

The project team has made considerable progress. Radio sites and Master sites are being energized. By April of 2011 thirty-five of sixty-eight sites were energized making the new radios functional and available for testing. By June of 2011 the microwave link between Alessandro and Blythe will be operational. Five Sheriff vehicles and two Fire vehicles have Motorola APX mobile radios installed. This installation has allowed the team to validate the installation and develop guidelines in preparation for installing over 3,000 mobile radios.

Schedule

Due to not all sites being acquired, the schedule has been revised. If all sites are in construction by June of 2011 Motorola and the County believe the following timeline can be achieved. The schedule plans for the smaller County departments to begin using the system by November of 2012 and the Sheriff to begin using the system by December 2012. If the enhanced coverage sites are adopted they will be integrated into the system based on the completion of acquisition.

Milestone	Complete
Equipment Installations	10/30/2012
End user radio training and key technical training	12/30/2012
System Acceptance Testing	11/02/2012
System Implementation	12/31/2012
County Departments	11/26/2012
Sheriff	12/31/2012
Punch list / Finalize/Documentation	01/21/2013
Radio Technical Training	08/30/2013

Conclusion

The Steering Committee is also preparing for post implementation by authorizing a cost and governance sub-committee to plan for the integration of other law enforcement and first responder agencies who have expressed interest in participating in the system. RCIT is concurrently developing cost models that will assist in establishing system fees as the information is processed through the sub-committee and a recommendation presented to the Steering Committee.

The PSEC project team objectives are to complete the acquisition of the final two sites, work with the commercial power providers to energize the sites; complete the site implementation; perform acceptance testing; and deploy the system to public safety first responders. Staffing reorganization and redeployment is being considered to meet the demands of a new regional Public Safety Enterprise Communication System. The Steering Committee will recommend a cost, governance, and support solution for the Board's approval. Following the adoption of this report the PSEC project team will continue bi-monthly status reports to the Board and the Steering Committee will resume quarterly updates with the Board sub-committee, Supervisor's Ashley and Tavaglione.

CHRONOLOGY OF BOARD ACTIONS

October 7, 2003

⇒ On October 7, 2003 (M.O. 3.57), the Sheriff and Supervisor John Tavaglione instructed the Executive Officer to work with the Sheriff's Department, Information Technology and Purchasing to secure the services of a communications consultant to review and analyze the current 800 MHz public safety system for effectiveness, coverage and safety.

⇒ **January 2004**

On January 2004, RCC Consultants was awarded consulting services to study the coverage and operational concerns associated with the current radio system, develop an RFP for submittal to industry vendors that would provide a fix for the problems identified in the study, and assist the county in the selection of a qualified vendor to redesign and implement a solution that will resolve the coverage and operational issues document in the study and RFP.

During the reviewing and editing of the draft RFP, additional radio data network requirements were added to the RFP to support the data transmission requirement of County Fire. Dr. Richter of the Richter Group was hired to validate the findings of RCC and to assist the County in the finalization of the RFP. The RFP was the final compilation of all the requirements identified by RCC Consulting, Sheriff, Fire, Purchasing, County Counsel, RCIT and the Richter Group.

⇒ **April 12, 2005**

On April 12, 2005 (M.O. 3.19), the Board authorized the Purchasing Agent to release the RFP to solicit proposals from qualified vendors to resolve the radio coverage and operation issues associated with the County's 800 MHz radio system. The Project Steering Committee was formed with membership from the Sheriff's Department, Fire Department, Facilities Management, RCIT and the Executive Office to monitor the new Radio Project's progress, and to make high-level decisions required to keep the project on track.

⇒ **September 27, 2005**

On September 27, 2005 (M.O. 3.44a, b & c), the Board took action on three items:

1. The Board established the PSEC Project Team and authorized funding for the team's administrative and operational expenses to complete the RFP evaluation, select a vendor, negotiate and award a contract, and implement the new radio system. The team was composed of staff from the Sheriff's Department, County Fire, EDA/Facilities Management and Information Technology (RCIT). The project team reports to the Steering Committee. RCIT was tasked with the responsibility of ensuring commitment, coordination and follow through of assignment from all project team participants. The Board was advised that after the new radio system was installed and certified, the project team members would return to their respective departments.

2. The Board approved a sole source legal service to support the evaluation, contract development and negotiations for the project. The Board also approved a contract amendment for RCC Consulting to augment staff support for the completion of the RFP evaluation and contract negotiations.

3. The Board granted in-principle approval to seek lease space in the City of Riverside for the project team.

During this time period, two Board of Supervisors members began meeting regularly with Sheriff, Fire, and RCIT staff for project progress reports.

⇒ May 2, 2006

In the May 2, 2006, FY05/06 Third Quarter Budget Report to the Board, the Board was advised that the PSEC Project Team operational budget for FY06/07 was estimated at \$5 million to support the various County staff involved in the successful implementation of a new radio system. It was also reported that maintaining and operating the radio system would be incorporated into RCIT's operations and that new backbone rates along with radio replacement rates would have to be developed based on the new system's operational cost.

⇒ January 30, 2007

On January 30, 2007 (M.O. 3.42b), the Board of Supervisors approved the agreement with Motorola Inc, in the amount of \$104,438,000; established the project start date as March 7, 2007; directed the project team to present the final design plan for the system with documentation demonstrating CEQA compliance, and, authorized EDA/Facilities Management to initiate in-principle efforts to acquire the sites and easements. Two vendors responded to the RFP that was released in April 2005, and after completing an extensive formal evaluation of the RFP responses, including revised vendor responses, and subsequent dual contract negotiations, the PSEC Project Team presented their recommendation to the Executive Steering Committee. The Executive Steering Committee reviewed the recommendation and concurred that Motorola, Inc. was the best qualified vendor and submitted the best proposal to meet the County's requirements. The original Motorola timeline was 44-months to complete.

The project budget was established as follows:

Vendor Contract	\$104.4M
Land Acquisition	\$8.6M
Contract and Land Contingency (10%)	\$11.3M
PSEC Team Operations (4 yrs)	<u>\$24M</u>
Estimate of Total System Cost	\$148.3M



January 30, 2007

Minute Order 3.42a of January 30, 2007, issued \$90 million in Lease Anticipation Notes (LANs) through CORAL. The Executive Office reported that the combination of the LANs and \$25 million in Designated Fund Balance for the Project would be sufficient to award a contract.



August 20, 2008

On August 20, 2008 (M.O. 3.52) the Board adopted a resolution related to CEQA and the Program Environmental Impact Report (EIR). Shortly after project initiation it was determined that a programmatic process was best suited to comply with CEQA. This process required an impact review that encompassed the project as a whole, as opposed to individual sites. It allowed for movement of the proposed sites and the addition of sites not identified in the Motorola proposal. Site acquisition could not begin until the EIR was adopted by the Board, resulting in a twelve month delay in site acquisition and construction. Sites in Western Riverside County are also subject to Multiple Species Habitat Conservation review adding to the delays.

The Federal component to the environmental assessment is the National Environmental Policy Act, or NEPA. The NEPA environmental assessment is required for all federally controlled property where PSEC proposes to erect a radio site. Each of the Federal agencies opted to perform their own NEPA compliance assessment. The assessment includes paleontology and archeological assessment; tribal consultations; and in some instances a consultation with the California Office of Historic Preservation. The NEPA duration was dependent upon the availability of resources within each agency and prioritized with all other agency land activities. Therefore, timelines to complete the work by Federal agencies created additional delays to the project timeline.



March 31, 2009

On March 31, 2009 (M.O. 3.33), the Board of Supervisors approved the **First Amendment** to the Motorola contract to accommodate change orders in the net amount of \$7,457,300 to implement the initial design provided by Motorola. The change orders included a number of credits to the County. Additionally, the first amendment included rough order magnitude construction estimates for eight existing sites. Motorola would provide final pricing as soon as final engineered sites designs were complete. The new contract amount for Motorola is \$111,895,079. On the same date, the Board of Supervisors approved the **Second Amendment** to the Motorola contract to commence work on the detailed design for the portable radio coverage enhancement phase of the project.

During the Detail Design analysis the PSEC Project Team identified areas in the proposed design where changes were required to meet the operational specifications of the County. The following proposed changes were presented to and accepted by the PSEC Executive Steering Committee for final approval.

- Increasing the tower height at select radio sites to meet the coverage objectives.

- Expansion of selected radio site shelters to meet the needs and contractual obligations of government agency partners. (Grant funding and contributions from agencies offset this cost by \$1,032,472).
- Modifications to proposed system components to reduce long term operational costs.
- 700MHz for aviation.
- Two additional dispatch consoles and call logger recorder.
- Purchase of additional network routers and switches to improve system operations. PSEC was able to purchase this equipment using the County's discount which is greater than can be obtained through Motorola.
- Some locations required aesthetic changes such as block walls or special fencing; road construction; and changes to the commercial power source.

The recommended changes required an increase in the Motorola contract by \$7,457,300. The project's financial planning was adequate to cover these change costs within the current project budget of \$148.3 million.

While the final coverage design provided by Motorola during the detail design phase exceeded the County's mobile (in car) coverage objectives, it did not meet the County's requirements for portable (on hip) radio coverage. To enhance the portable radio coverage, both the Motorola and the PSEC Project Teams reconvened and developed a solution that did meet the portable radio coverage objectives of the County.

The PSEC Executive Steering Committee requested a mid-course schedule adjustment to the project plan to extend the original project schedule of October 2010 by an additional 12 months to October 2011. The portable radio coverage enhancements originally consisted of twelve sites and after analyzing the coverage contribution three sites were eliminated. The completion of the nine is expected to be twelve months Board acceptance. The additional sites are known as the "Enhanced Coverage" phase.

The PSEC Executive Steering Committee was to return to the Board for approval to proceed with the portable radio coverage Enhanced Coverage effort once the detail design for this activity was complete, and all cost and schedule impacts were fully defined. The PSEC Project Team and the Executive Steering Committee recommended maintaining any realized budget savings in the project contingency to address any potential unforeseen costs.



February 2010

In February 2010 minute order, the Board of Supervisors executed the **Third Amendment** with Motorola increasing the contract amount from \$111,895,079 to \$114,057,692 to accommodate project revisions and modify contract milestone payment dates. The Board also reaffirmed the total system cost at \$148.3 million and approved a budget realignment to move \$4.1 million to the project's contingency fund.

The PSEC Project Team, working from the Detail Design, identified additional change orders (including credits) to reconcile equipment needs, and modify proposed technology to better meet the County's requirements. The proposed changes were reviewed and recommended by the PSEC Executive Steering Committee for final approval:

- Increasing the tower height and building modifications at select radio sites to meet coverage objectives.
- A credit from Motorola for the reconciliation of proposed vs. actual equipment order, as well as modifying the equipment order to utilize newer and more flexible wireless technologies.
- The reconciliation of road and power costs due to radio site location changes.
- Increased expense to account for the 1% increase in California sales tax (This was later resolved during the project)
- Adding the Paradise Site at the southern end of Norco to achieve required coverage.

The recommended changes required a \$2,162,613 increase to the Motorola contract. The contract total cost was changed from \$111,895,079 to \$114,057,692.

At this point in time, the PSEC Project Team's operating expenses and the land acquisition costs were projected to be \$4.1 million less than originally estimated. The PSEC Project Team and the Executive Steering Committee recommended reallocating these funds to the project's contingency to fund the change orders in Amendment #3, and also to maintain enough contingency balance to address potential unforeseen costs. The Board approved the request and the budget was realigned with a contingency amount of \$6,437,819, and remained within the total system cost estimate of \$148.3 million.



June 15, 2010

On June 15, 2010 (M.O. 3.20), the Board approved the **Fifth Amendment** with Motorola decreasing the contract amount from \$114,057,692 to \$99,876,977.91, approved the lease agreement with Motorola for the lease purchase of mobile and portable radio equipment, and directed RCIT to manage the County lease arrangement for all county mobile and portable radio units to ensure radio equipment life-cycle replacement.

During the project, Motorola advised the county of a new leasing option for the purchase of portable and mobile radios. Under a lease purchase option, county departments could enter into a 10-year, fixed-rate lease with a dollar buyout for the radios; including radios they had on hand at the start of this project in 2007 (total of 3200), as well as for the growth in units since that time (reported as 1507 units originally). The project budget did not account for the cost of the increase in units which has been adjusted to 1,380 units and amounts to \$8.9 million.

The advantage to the lease purchase option was that departments could budget for a set monthly payment, rather than being faced with large capital outlays for replacement units, or for additional units over time. Also, as surrounding municipalities opted to utilize the county's radio system, the lease option provided for a financing option to do so without a large capital outlay. This provided a keen advantage when promoting interoperability. However, the most immediate obvious advantage was the cost avoidance of \$ 8.9 million in additional costs to the project.

Lease purchasing equipment is a technology best practice that ensures life-cycle replacement of aging equipment – without the need for a large capital outlay. As such, the PSEC Steering Committee, with Executive Office concurrence, recommended lease purchasing of all radios to ensure the continual replacement of equipment to support public safety and other critical governmental services.

By entering into a lease agreement, the overall PSEC project implementation contract with Motorola was reduced by \$14,180,714.09 for the original 3,200 units and moved the responsibility of the radio purchase for these units as well as the additional growth in units through the lease arrangement. It was reported that of the ten departments that would participate in the lease through Motorola, the monthly budgeting of replacement equipment currently occurs within the Sheriff's department and RCIT; for the other eight departments, the monthly lease was to be a new cost. The Sheriff currently pays approximately \$136,000 each month into the radio replacement fund.

The total lease cost was reduced by \$5.6 million from the forthcoming rebanding credit from Sprint Nextel, as well as the discount credit offered by Motorola in February 2010. The Motorola lease agreement commenced upon execution, however the lease payments to county departments will begin in FY12/13, when the radios become fully operational. This provided for two years of advanced planning for departments that are not accustomed to budgeting for life-cycle replacements. As part of the deferral of the lease payments until FY12/13, the county is required to pay \$1,130,168 to Motorola. This amount will be applied to the lease and will reduce the total lease cost. The interest rate was fixed at 4.07%.

It was agreed that RCIT would handle the master lease purchase agreement with Motorola and pass-through the direct lease costs to the departments. The lease payment would be a separate RCIT charge to the department and will not be included in the radio system operational support fee. This allows for transparency of actual equipment lease costs and keeps separated the costs associated with supporting the entire radio system (the backbone support).

CHA	101	40	7,225	General Fund
CHA	4	92	5,174	General Fund
Clerk of the Board	2		100	General Fund
District Attorney	97	188	18,092	General Fund
Fire	27	33	3,968	General Fund
Parks		11	595	Non-General Fund
Probation		1	54	General Fund
TLMA - Code Enforcement	54	2	2,815	General Fund
Waste Management	2		81	Non-General Fund
RCIT	95	145	14,873	ISF Rates
Total	2681	2026	\$217,057	

*A portion of the radio costs are recovered through contract cities fees.

Note: as a pass-through cost, no RCIT administrative or overhead fee is included in the direct lease cost.



October 19, 2010

On October 19, 2010 (M.O.) 3.41 the Board approved the purchase of radio equipment from awarded vendors in order to migrate county VHF/UHF radio systems to narrowband frequencies as mandated by the FCC; and, approved allocating \$1.5 million from the PSEC fund to cover Fire's cost for narrowbanding. The FCC directed that all VHF/UHF radio systems must migrate to new frequencies. County Fire, Community Health Agency (CHA) and RCIT opted to migrate to the narrowband solution while other department opted to migrate to another radio system.

The cost for CHA to migrate was \$5,000 and \$14,283 for RCIT; both departments allocated funds for the effort. The total migration cost for Fire was \$2,989,933. Fire offset \$1,389,933 from grants and prior year savings, but sought funding assistance for the remaining \$1.5 million. Since the FCC requirement was associated with public safety radio for Fire, the PSEC Steering Committee on July 13, 2010 approved the use of PSEC contingency funds to pay for Fire's remaining cost of \$1,500,000.



February 15, 2011

On February 15, 2011 (M.O. 3.36), the Board of Supervisors approved the Frequency Reconfiguration Agreement (FRA) between the County, Sprint Nextel, and the Federal Communications Commission – Transition Administrator. There is also a Reconfiguration Planning and Implementation Agreement (RPIA) with Motorola. The FRA includes a commitment from Sprint Nextel to "buy back" specific 800 MHz MACOM subscriber equipment upon completion of the PSEC project. The FCC will receive the 800MHz frequencies currently licensed to the County. The approved **Fourth Amendment** between the county and Motorola, directed the Auditor-Controller to make the necessary budget adjustments.

During this multi-year project, the Federal Communication Commission (FCC) mandated rebanding of 800 MHz frequencies due to interference from commercial cellular transmitter sites – specifically Sprint Nextel. Rebanding is the process of realigning the 800MHz frequency band. The reallocating of the frequencies mandates a physical change to all subscriber units and hilltop radio equipment. The FCC then further discovered a shortage of 800 MHz spectrum and strongly encouraged PSEC be reengineered and redesigned using the newly allocated 700 MHz frequency band, which included spectrum reserved for public safety. As a result, Sprint Nextel was obligated to pay for Motorola reengineering expenses and County staff time. Sprint Nextel was also to pay for Riverside County's Office of Education 800MHz rebanding. Additionally, Sprint Nextel was to reimburse the County for the value of the MACOM radios that will no longer operate under the new 700 MHz frequency band. These radios must be relinquished to Sprint Nextel once the PSEC system is operational and the MACOM system is decommissioned. The 800 MHz frequencies will then be returned to the FCC.

It was recommended that the \$6 million in funds received from Sprint/Nextel reimburse PSEC staff time and attorney's fees associated with the rebanding activity and the balance designated for project costs associated with the county's public safety enterprise communication system. This recommendation was consistent with prior project recommendations to keep funding available for the project.

ENHANCED COVERAGE DETAIL DESIGN

The PSEC Executive Steering Committee was to return to the Board for approval to proceed with the portable radio coverage enhancement effort once the detail design was complete, and all cost and schedule impacts were fully defined (See March 31, 2009 M.O. 3.33) Board approval of the implementation of Enhanced Coverage sites will require an expenditure of \$1.7 million for land acquisition activities and \$936,001 paid to Motorola for diesel generators at the remote sites. This will increase the Motorola contract from \$99,876,978 to \$100,628,441.

The original estimated cost for commercial power to the sites was \$4.97million. The impact to the environment is significant, requiring the installation of over 1,400 power poles. By converting five sites to diesel power the expense to the county for commercial power is now estimated at \$1.0 million and avoids the environmental impact associated with installation of 1,400 power poles. There are no additional known Motorola contract increases associated with the implementation of Enhanced Coverage sites; all related Motorola work is within the current contract obligation for enhanced coverage.

The annual operational cost for these nine sites is estimated at \$779,334 and will be incorporated into the new FY12/13 radio system operation support costs (backbone costs) paid by the user departments.

Enhance Coverage Sites:

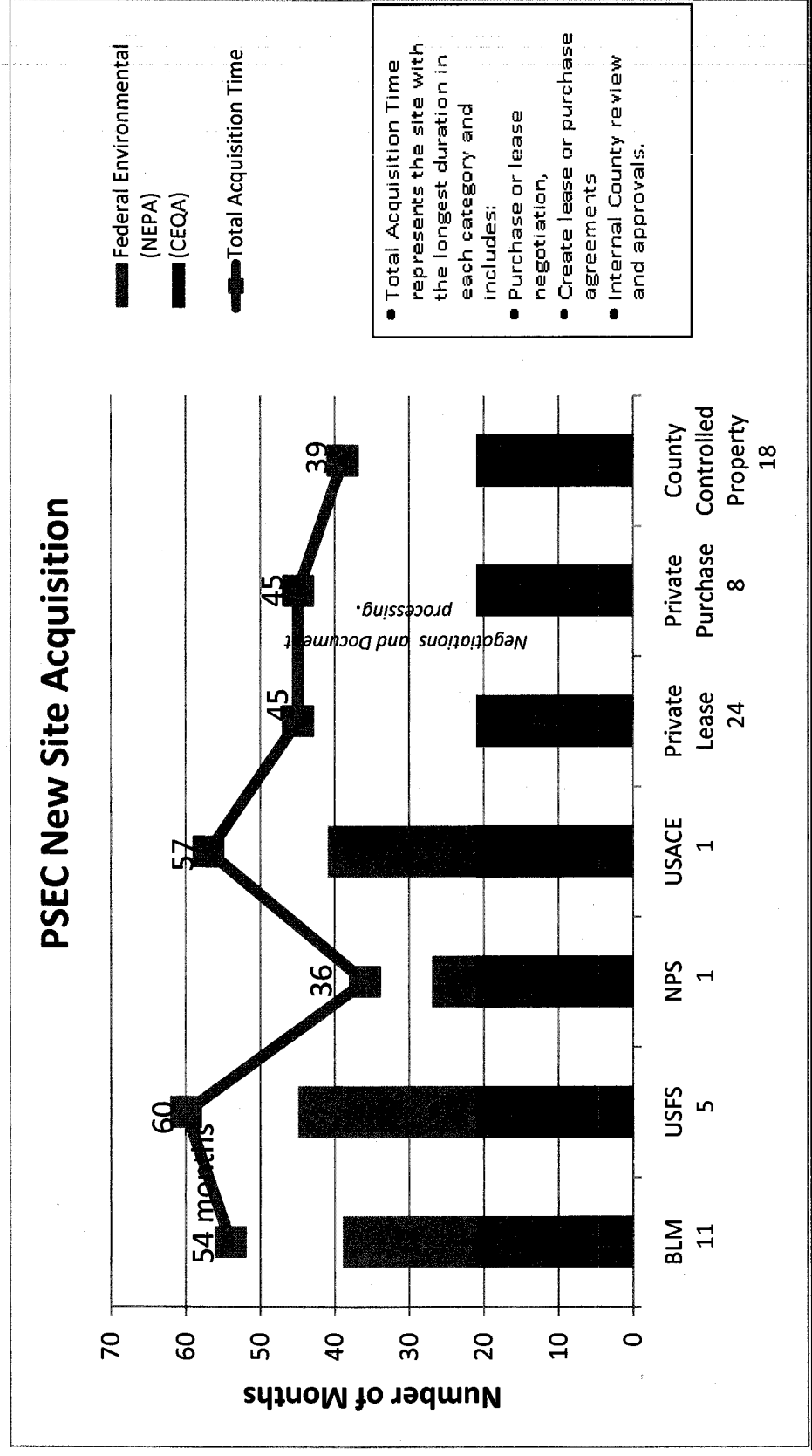
Following is a list of the Enhanced Coverage Sites and the general vicinity where they will provide additional coverage:

1. Billy Goat; will provide coverage in the Sage, Anza Cahuilla IR, HWY 79 and Hwy 371 area.
2. Box Canyon; will provide primary coverage along Box Canyon Road in the City of Mecca.
3. Lake Hemet; will provide coverage in the Lake Hemet campgrounds, Garner Valley, Hurkey Creek Park and surrounding trails and campgrounds.
4. Midland; will provide coverage in the Midland areas.
5. Palen McCoy; will provide coverage in the Palen McCoy area.
6. Palo Verde; will provide coverage in the southeastern portion of the county.
7. Road 62; will provide coverage in the HWY 62 at Road 177 and surrounding areas.
8. Toro Peak; will provide coverage in the Santa Rosa mountains.
9. Snow Peak; will provide coverage in at San Jacinto Peak, HWY 243 and nearby valleys and canyons.

The Steering Committee recommends approval of Enhanced Coverage sites to provide portable radio coverage to the greatest degree possible achievable throughout Riverside County. There will be a Form 11 on a future Board agenda seeking approval for these items.

OUTSTANDING ISSUES AND RISKS

Site acquisition has been a risk to the project from the onset. The chart below depicts the length of time required to acquire sites by category of ownership. The Federally controlled sites have by far been the most difficult to acquire.



Site Acquisition:

- Caspers Park in Orange County is the alternative site for Rancho Carrillo. The Rancho Carrillo community placed a great amount of pressure on the Forest Service to deny the county request for a site on Forest Service land adjacent to their community. Caspers Park is delayed while we go through the Orange County Parks right of entry and site lease process. The first meeting with Orange County Parks was September 2010. The EDA real estate team provided the information requested by OC Parks needed for a decision. During a follow up meeting in March 2011 OC Parks has not acted on the request. Instead, they are asking for additional information. Park staff is showing very little interest in cooperating with the EDA Team.
- Due to projected delays resulting from legal actions and subsequent additional legal fees associated with the condemnation of the preferred Timoteo site, PSEC is pursuing a long term lease of an adjacent parcel. The alternate site is 100 feet lower in elevation than the preferred site. There will be additional expense for increasing the tower height at the new location, but less than the legal fees and the project will continue as scheduled.
- Big Maria, an existing radio site in the hills above highway 95 north of Blythe. The original plans were a remodel of this site, replacing the 30 year old shelter, and strengthen the existing tower. The site is leased from the BLM and due to archeological concerns raised by Native American tribes in the area the BLM will not allow the construction activities needed to remodel the site. A site has been located in Arizona on land owned by the CRIT. They have tentatively agreed to a lease agreement. There will be additional expense for this relocation; the final costs are being developed.
- Environmental impacts continue to delay construction at several sites.
- Commercial power providers have very bureaucratic processes that must be followed in order to bring power to sites.

Appendix A provides a list of 68 radio sites that will ultimately support the PSEC system.

CHANGE ORDERS:

In November of 2010 the Steering Committee approved change orders for a total of \$872,267. Following is a breakdown of the costs:

Description	Cost
Installation of ground connection shields	\$22,648
Additional Bollards on outside of propane tank at Banning. Building code requirement.	\$21,295
San Bernardino permit fees for Joshua Tree	\$16,498
Modify propane tank enclosure at Corona	\$10,021
Ranger Peak dullyfing of the tower, shelter, and fence. Required by Forest Service.	\$16,408
Redesign Cajalco site required by MWD.	\$9,147
Pavement of Line road required by CALTrans.	\$74,785
Dullyfing tower, fence and shelter at Red Mountain. Required by the Forest Service.	\$13,254
Blue Mountain power re-routing required by SCE.	\$100,126
Providing power at Temescal	\$99,515
Temporary fence at Rice requested by BLM to protect land on other side of road	\$4,234
Gray microwave dishes required by Forest Service.	\$15,390
Vaquero retaining wall constructed as a requirement of the water district.	\$63,088
Glen Avon retaining wall as required by the water district.	\$94,633
Diesel fuel tank at Glen Avon requirement of JCSD.	\$81,505
Diesel fuel tank at Sunnyslope, a requirement of JCSD.	\$81,505
Belle Mountain Tower painting/acid wash, requirement of the National Park Service.	\$24,319
TLMA road grading credits	
Leona	(\$299)
Morongo	(\$12,865)
Temescal	(\$2,288)
Vaquero	(\$22,195)
Mt David	(\$10,942)
Spring Hill	(\$16,592)

Santa Rosa Pk	(\$3,310)
Elsinore Pk	(\$63,535)
Step down transformer for Vaquero Site due to SCE power distribution 240 vs 207 AC	\$4,179
Redesign of Beacon Hill for new site location, to satisfy the Norco city Counsel.	\$37,253
Cable Tray and grounding at Colorado River Dispatch	\$2,618
Margarita site redesign	\$29,688
Box Springs- staff time for the Power outage.	(\$625)
Additional Radio licenses for supplemental APX radios (license for additional radios financed with lease agreement)	\$20,106
Monopole replacement and site move of 100 ft at Sunnyslope	\$162,701
Total	\$872,267

The Steering Committee also approved the following change orders in January of 2011:

Description	Cost
North Mountain site design services	\$10,212
Quail Valley additional drive through gate, required by JCSD.	\$14,269
Snow Peak Permit Fees	\$17,000
Sunnyslope road redesign and gate move, required by JCSD.	\$6,313
Step up transformer for Mead Valley Site due to SCE power distribution 240 vs 207 AC	\$18,252
Margarita site redesign, location of site moved.	\$35,553
Step down transformer for Sunnyslope Site due to SCE power distribution something higher down to 240 AC	\$4,179
CRIT permit fees for Quail Mesa	\$10,781
Blythe power changes	\$9,025
Red Mtn Power change	\$25,218

Repair of Cactus City ceiling after exploratory opening to validate design details (details were incorrect so decision was made to change direction)	\$2,316
Credit for change back from block wall to fence at Marshall, Arlington, and Lake Mathews	(\$88,904)
Generator Exhaust pipe extension as required by EDA Design and Construction.	\$10,550
BCTC ground trenching	\$10,539
Chuckwalla tower foundation rock anchor cost	\$28,443
Chuckwalla tower foundation requiring sock anchors for holes 3 and 4	\$25,858
Hidden Valley site redesign twice extra	\$ 95,408
Credit for Windows 7 license purchase for fire 4.9 computers	(\$13,000)
Path surveys for 10 sites that towers moved	\$ 51,000
Dulify El Cariso tower required by Forest Service.	\$ 9,815
Timoteo tower extension required by move to new location.	\$ 281,818
	\$564,647

Site Construction Cost Increase:

Motorola did not have an opportunity to thoroughly assess the work effort at the listed in the table below. Seven of the eight sites are controlled by a Federal Agency. At the time the County did not have a right-of-entry necessary to conduct a complete inspection. Therefore, the sites were presented in amendment 1 with "rough order magnitude" ROM pricing. By agreement, Motorola would provide final pricing when the sites were available for review.

EXPANSION SITE COST SUMMARY			
Site Name	ROM Price in Amendment 1	Forecast at Complete Discounted Price	Variance
Belle Mountain	\$488,550	\$578,428	\$89,878
Big Maria	\$640,548	\$646,296	\$5,748
Blythe	\$734,526	\$954,997	\$220,471
Mount David	\$429,660	\$629,333	\$199,673
Red Mountain	\$546,239	\$773,538	\$227,299
Santa Rosa Peak	\$930,333	\$1,825,867	\$895,534
Santiago Peak	\$743,852	\$1,235,854	\$492,002
Whitewater	\$440,889	\$578,984	\$138,095
ROM Total	\$4,954,597	\$7,223,297	\$2,268,700

12-Month Contract Extension Costs:

The table below represents Motorola's request for reimbursement for the twelve month project extension. The negotiated value represents Motorola's concession for delays caused by their inability to provide the VHF frequencies for the sites located in the southwest corner of the County. The details of the concessions are captured in a future contract amendment.

The original value of the Motorola request was \$13M and the negotiated value is currently at \$4.9M. The final amounts will be presented to the Board for approval in a future report.

Types of Cost Impact	Net Extended Schedule Price to Motorola	Cost Incurred by March 1, 2011
Staffing extension for initial 9 months delay	\$2,655,518.13	\$2,389,966.31
Staffing extension for additional 3 months delay	\$2,543,937.50	\$1,695,958.33
Administrative	\$399,981.81	\$399,981.81
Subcontractor Impact	\$604,553.68	\$604,553.68
Warranty	\$1,451,678.50	\$0.00
Software	\$250,000.00	\$0.00
Risk of loss to idle sites	\$0.00	\$0.00
Loss of efficiency	\$0.00	\$0.00
Total Extended Schedule Price	\$7,905,668.62	\$5,090,460.14

\$12,996,129.76

Negotiated value:

\$4,965,053

As a result of the project extension the schedule has been revised. If all sites are in construction by June of 2011 Motorola and the County believe the following timeline can be achieved. The project is subject to further delays if change orders are not processed in a timeline manner.

The schedule calls for the smaller County departments to begin using the system by November of 2012 and the Sheriff to begin using the system by December 2012. If the enhanced coverage sites are adopted they will be integrated into the system based on the completion of acquisition. The following milestones reflect the enhanced coverage sites adopted by April 2011.

Milestone	Start	Complete
Equipment Installations	03/10/2011	10/30/2012
End user radio training and key technical training	12/26/2011	12/30/2012
System Acceptance Testing	11/07/2011	11/02/2012
System Implementation	11/05/2012	12/31/2012

Smaller County Departments	11/02/2012	11/26/2012
Sheriff	11/27/2012	12/31/2012
Punch list and Finalize Documentation	01/01/2013	01/21/2013
Radio Technical Training	01/15/2013	08/30/2013
Enhanced Coverage 9 site phase	03/22/2011	01/21/2013
Acceptance Test	06/29/2012	11/02/2012
Cut-Over	11/05/2012	12/31/2012
Finalize	01/01/2013	01/21/2013

All issues and costs described above will come before the Board for individual approval as the negotiations with Motorola and further opportunities to bring costs down are exhausted.

PROJECT BUDGET:

In June of 2010, The Board of Supervisors approved the PSEC Steering Committee recommendation to lease purchase all radios to ensure the continual replacement of equipment to support public safety and other critical governmental services. By entering into a lease agreement, the overall PSEC project implementation contract with Motorola was reduced by \$14,180,714.09 and this money was moved to the PSEC contingency fund at the direction of the Chief Financial Officer. Additionally, the project avoided a net increase of \$9.2 million for the additional needed radio units.

The result of entering into the lease agreement set the financial obligation for the radios directly to the subscribers (users) and brought an immediate cash relief to the overall project. This cash savings can be used to address the issues as list above.

Following is a chart of anticipated expenses and expense paid through March 31, 2011. The final dollar amounts will be presented to the Board for approval in a future report. The chart also shows available cash balance to support the project.

Estimate of Total System Cost	\$148,300,000
Subscriber Lease	\$14,180,714●
Undesignated Project Funds	(\$14,180,714)
Site Acquisition Delay Costs	\$351,858
Motorola Contract Extension	\$4,965,053●
Enhanced Coverage	\$2,656,001
Additional Radio Lease Payments	\$7,322,229

Change Orders	\$5,997,850
Narrowbanding for Fire Department	\$1,500,000
Public Safety InterOP Comm. Grant Fund	(\$604,089)
911 Communication upgrades	\$1,666,667
911 Communication Upgrades	\$833,333
Verizon Circuit Costs	\$189,170
Additional Contingency Recommended	<u>\$2,100,000</u>
Net Budget Activity Increase/(decrease)	\$12,797,358
Revised Project Budget	\$161,097,358

Cash Available

GF Designated FY11/12	\$1,565,275
GF PSEC Contingency	\$25,078,607
2007A Bond Proceeds	\$34,593,636
Nextel Rebanding Cash Credit	\$3,057,805
Nextel Rebanding Cash Credit Pt. 2	\$2,500,000
DIF Enhanced Coverage Radio Sites	\$2,656,001
Radio Replacement Fund	<u>\$6,325,707</u>
	\$75,777,031

① The original Motorola contract value of \$104.4M was reduced by entering into a lease agreement for the subscriber radios. The overall PSEC project implementation contract with Motorola was reduced by \$14,180,714.09 for the original 3,200 units and moved the responsibility of the radio purchase for these units as well as the additional growth in units through the lease arrangement. It was reported that of the ten departments that would participate in the lease through Motorola, the monthly budgeting of replacement equipment currently occurs within the Sheriff's department and RCIT; for the other eight departments, the monthly lease was to be a new cost. The Sheriff currently pays approximately \$136,000 each month into the radio replacement fund.

② The original value of the Motorola request was \$13M and the negotiated value is currently at \$4.9M. The final amounts will be presented to the Board for approval in a future report.

Radio System Operational Support Costs

The current MACOM radio system includes 26 radio sites that support both voice and data using an older technology circuit board switch system. The new Motorola system will include 68 new or remodeled radio and high performance data sites; 76 total locations with two master sites and dispatch centers; 101 Fire facilities, 52 high priority buildings. The PSEC system will be comprised of two separate networks (voice and data) and is based upon state of the art computing platforms (servers) to make calls, route data, and provide interoperability.

The PSEC system will be the first system operational in the nation that utilizes multiple frequencies, including 700MHz, 800MHz, VHF and the latest in Motorola land mobile radio technology. There are no other governmental agencies that have implemented a system of the size and scope of Riverside County's – due to the sheer size of our county's boundaries and the technology being deployed.

The PSEC Team has formed a Cost and Governance working group to identify the various cost models and options for managing the PSEC system once implemented. The governance group has been working with other agencies who have implemented similar radio systems to compile a list of best practices. The current MACOM radio system was designed to support Riverside County Sheriff exclusively and is solely supported by County radio engineers and technicians; the new PSEC system will provide regional support for Riverside County and many of the law enforcement agencies within the county. PSEC will also expand the interoperability between neighboring Counties. When complete the PSEC system will require the effort of many other technical staffs for support. The team is working to identify all anticipated costs to support the system.

Identifying new support costs for the new system first entails identifying the base operation cost for the voice, data, and microwave support. Then integrating costs for new services such as middleware and 4.9 wireless. Base costs include all communications site expenses such as leases, utilities, fuel and fuel delivery charges, HVAC maintenance, building infrastructure maintenance, road access, emergency generator maintenance, UPS maintenance, EDA technical support costs, bio-hazard mitigation, AQMD and EPA annual fees, perimeter and access security, weed/brush abatement, and system reporting services.

Base costs also include maintenance and support for the county's Alcatel MDR-8000 microwave network that will continue to exist, vehicle fleet costs, maintenance and support for conventional and interoperability radio network, Radio IP support, dispatch console support, and maintenance and support for all electronic equipment in County vehicles and patrol cars, to include mobile data computers, HPD modems, 4.9 GHz modems, data cellular modems, mobile radios and GPS devices.

These base costs exist with the current radio system in place and will continue when the new system goes live. From this base, the costs and support of the new system will be built upon.

County staff will be required to support the base operations, however support of the new system components could be provided by county staff, Motorola, or a combination thereof. The team is evaluating all options to identify the most cost efficient support of the new system. During FY11/12, a new rate will be established through the Cost and Governance Working group to support the new system and presented to the PSEC Steering Committee. The rate will then be submitted to the Auditor Controller and the Executive Office for review and approval. Departments will be advised as soon as possible of the magnitude of the rate. The new radio system operational support rates will be implemented in FY12/13 when the radios become fully operational.

ACCOMPLISHMENTS

The project team has completed the following milestones:

- Radio equipment for the original 70 sites was staged and tested at the Motorola Schaumburg, IL facility.
 - The list of equipment includes:
 - Microwave systems
 - Radio systems
 - High Performance Data systems
 - 4.9 wireless hotspots
 - All mobile and portable subscriber units have arrived at the Motorola warehouse.
 - Mobile and portable subscriber unit definitions have been developed
 - Sheriff deputy focus group evaluated new subscriber unit definitions and have accepted the design
 - Vehicle mobile radio installation requirements with antenna placement are complete
 - Vehicle radio installation sites identified and reserved
 - Completed the construction of forty-four sites
 - Radio equipment is installed and optimized at forty-four sites
 - The two master sites are operational

- Infrastructure Equipment is installed at five dispatch locations
 - Microwave and radio antenna are installed at forty-four locations
- Completed the installation of all 130 4.9 wireless hotspots at Fire Stations and Sheriff Stations.
- Completed Enhanced Coverage Sites Design Review
- Completed three years of Rebanding negotiations with Sprint Nextel, the FCC, and Motorola resulting in a \$6,085,525 credit to the County.
- Completed four year negotiations with the Bureau of Land Management, Forest Service, and USACE
- Radio basics training course complete and training started

APPENDIX A

PSEC Radio Site List

	Site Name	Current Owner	Purchase/Lease
1	Cactus City	BLM	Lease
2	Chuckwalla	BLM	Lease
3	Indio Hill	BLM	Lease
4	Whitewater	BLM	Lease
5	Avocado Flats	BLM	Lease
6	Black Jack	BLM	Lease
7	Corn Springs	BLM	Lease
8	Rice	BLM	Lease
9	Road 177	BLM	Lease
10	Vidal Junction	BLM	Lease
11	Wiley's Well	BLM	Lease
12	Alessandro	COR	County Owned
13	Banning	COR	County Owned
14	Black Rock	COR	County Owned
15	Box Springs	COR	County Owned
16	Hemet	COR	County Owned
17	Indio Prime	COR	County Owned
18	Mount David	COR	County Owned
19	Perris	COR	County Owned
20	Riverside CAC	COR	County Owned
21	Santa Rosa Peak	COR	County Owned
22	Arlington	COR	County Owned
23	Blythe	COR	County Owned
24	Brookside	COR	County Owned - TLMA
25	Homeland	COR	County Owned
26	Leona	COR	County Owned
27	Mead Valley	COR	County Owned
28	Mecca Landfill	COR	County Owned
29	Menifee	COR	County Owned
30	Big Maria (Quail Mesa)	Lease	CRIT
31	Edom Hill	Lease	Tower Mgmt Co
32	Marion Ridge	Lease	PCWD
33	North Mountain	Lease	Lease from Private
34	Paradise	Lease	Crown Castle
35	Black Eagle	Lease	Kaiser
36	Cajalco	Lease	MWD

37	Corona	Lease	CNUSD
38	Estelle Mountain	Lease	RCHCA
39	Glen Avon	Lease	JCSD
40	Green River	Lease	CORPS
41	Hidden Valley	Lease	CRIT
42	Iron Mountain	Lease	MWD
43	Joshua Tree	Lease	ATC
44	Lake Matthews	Lease	WMWD
45	Line	Lease	Homes 4 Less, Inc.
46	Margarita	Lease	Lease from Private
47	Redondo Mesa	Lease	RCWD
48	Spring Hill	Lease	Navy
49	Sunnyslope	Lease	JCSD
50	Timoteo	Lease	Lease from Private
51	Vaquero	Lease	RCWD
52	Winchester	Lease	Lease from Private
53	Belle	NPS	NPS
54	Rancho Carrillo (Caspers Park)	OCParks	Lease
55	Beacon Hill	Purchase	County Owned
56	Blue Mountain	Purchase	Purchase
57	Clinton Keith	Purchase	Purchase
58	Lake Riverside	Purchase	Purchase
59	Marshell	Purchase	Purchase
60	Morongo	Purchase	Purchase
61	Quail Valley	Purchase	Purchase
62	Ridge Road	Purchase	Purchase
63	Temescal	Purchase	Purchase
64	Elsinore Peak	USFS	USFS - Cleveland
65	Red Mountain	USFS	USFS - SB
66	Santiago Peak	USFS	USFS - Cleveland/ATC
67	El Cariso	USFS	USFS - Cleveland
68	Ranger Peak	USFS	USFS - SB

Enhanced Coverage Sites

1	Billy Goat	Lease	Private
2	Box Canyon	BLM	BLM
3	Lake Hemet	Lease	LHWD
4	Midland	BLM	BLM
5	Palen McCoy	BLM	BLM
6	Palo Verde	BLM	Private
7	Road 62	BLM	BLM
8	Snow Peak	Lease	Private
9	Toro Peak	Lease	Tribal



County of Riverside Public Safety Enterprise Communication

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Section 1 Coverage Enhancement System Description



1.1 Purpose

The purpose of the Enhanced Coverage sites is to provide the additional coverage as agreed upon by the County and Motorola. This document describes the design details of the Enhanced Coverage System. This document also describes the site being added to the simulcast Northwest Cell.

1.2 Enhanced Coverage Sites

The Enhanced Coverage (EC) System consists of a total of 9 sites. Ten sites were analyzed; however, based on acquisition issues, the 10th site is no longer part of the design. These 9 sites provide coverage in the necessary areas the County has identified as needing supplemental portable on street coverage.

In addition to the 9 sites being added as part of the Enhanced Coverage System, a 10th site is being incorporated into the overall System. Paradise is a simulcast remote site that will be part of the Northwest Cell.

The following table illustrates the distribution of the EC Sites and Paradise site in bold font.

Table 1: Coverage Enhancement and Paradise Voice Radio System Sites

Sites/Cells	Remote Sites	No. Of Channels	Voice Paths
Desert (DC) Cell (3 Sites)	Black Jack ¹ Palen McCoy Midland	3	4
Santa Rosa (SR) Cell (2 Sites)	Santa Rosa Peak ¹ Toro Peak	3	4
Indio (IN) Cell ² (6 Sites)	Cactus City 1 Cactus City 2 Indio Hill 1 Indio Hill 2 Mecca Land Fill Box Canyon	4	6
700 MHz ASTRO 25 Trunked Repeater Sites	Road 62	3	4
	Palo Verde	3	4
	Lake Hemet	3	4



Sites/Cells	Remote Sites	No. Of Channels	Voice Paths
(5 Sites)	Billy Goat	3	4
	Snow Peak	3	4
Northwest (NW) Cell ³ (14 Sites)	Blue Mtn. Box Springs Riverside Cajalco Beacon Hill Corona Arlington Lake Mathews Sunnyslope Glen Avon Green River Temescal Marshell Paradise	7	12

Notes:

¹ This site is part of the Initial Configuration design. It is currently an ASTRO 25 trunked repeater site with 3 channels or 4 talk paths.

² This simulcast cell is part of the Initial Configuration design. Box Canyon will be added to this cell as part of the Enhanced Coverage System.

³ The simulcast cell is part of the Initial Configuration design. Paradise will be added to this cell to provide supplemental in-building coverage.

The prime sites for the new Enhanced Coverage System simulcast cells are shown in Table 2. Black Jack and Santa Rosa Peak are co-located with simulcast remote sites. Table 2 also shows the prime site for the Northwest Cell that Paradise will be part of.

Table 2: Prime Sites

Cell	Prime Site
Desert Cell (DC)	Black Jack
Santa Rosa Cell (SR)	Santa Rosa Peak
Northwest Cell (NW)	Alessandro



1.2.1 EC Site and Paradise Site Equipment

The table below summarizes the equipment included for the EC sites and the Paradise site.

Table 3: Desert Simulcast Cell Remote Site Equipment

Simulcast Remote Sites	Qty	Item Description
Palen McCoy Midland	1	GTR 8000 Base Radio Expandable Site Subsystem – 4 Talkpaths <ul style="list-style-type: none"> ◆ 3 GTR 8000 Simulcast Base Radios ◆ Redundant GCP8000 Controller with Embedded LAN Switches
	2	RGPS Timing Antenna/Receiver
	1	Combiner
	1	Tower Top Amplifier
	1	Receiver Multicoupler
	2	S2500 Multiprotocol WAN Router
	1	PTP58600 Ethernet Bridge Outdoor Unit (ODU) at Palen McCoy
	2	PTP58600 Ethernet Bridge Outdoor Unit (ODU) at Midland
	1	PTP58600 Power Indoor Unit (PIDU) at Palen McCoy
	2	PTP58600 Power Indoor Unit (PIDU) at Midland
	1	Ethernet Switch (Midland only)
	1	IP MUX (Midland only)
	1	MOSCAD RTU
	1	Marathon M12V40 Series 40 AH Battery Pack
	1	Eaton 9130 series 900W/1000VA UPS
	1	Antenna System <ul style="list-style-type: none"> ◆ 1 TX AND 1 RX Antennas ◆ 1 Microwave Dish Antenna ◆ CAT5 Cable and Connectors ◆ Transmission Line and Connectors ◆ Lightning Arrestors ◆ Ground Clamp Kits and Cable Weatherproofing



Table 4: Santa Rosa Simulcast Cell Remote Site Equipment

Simulcast Remote Sites	Qty	Item Description
Toro Peak	1	GTR 8000 Base Radio Expandable Site Subsystem – 4 Talkpaths <ul style="list-style-type: none"> ◆ 3 GTR 8000 Simulcast Base Radios ◆ Redundant GCP8000 Controller with Embedded LAN Switches
	2	RGPS Timing Antenna/Receiver
	1	Combiner
	1	Tower Top Amplifier
	1	Receiver Multicoupler
	2	S2500 Multiprotocol WAN Router
	2	PTP58600 Ethernet Bridge Outdoor Unit (ODU)
	2	PTP58600 Power Indoor Unit (PIDU)
	1	Ethernet Switch
	1	IP MUX
	1	MOSCAD RTU
	1	Marathon M12V40 Series 40 AH Battery Pack
	1	Eaton 9130 series 900W/1000VA UPS
	1	Antenna System <ul style="list-style-type: none"> ◆ 1 TX AND 1 RX Antennas ◆ 3 Microwave Dish Antennas ◆ CAT5 Cable and Connectors ◆ Lightning Arrestors ◆ Ground Clamp Kits and Cable Weatherproofing



Table 5: Indio Simulcast Cell Remote Site Equipment

Simulcast Remote Sites	Qty	Item Description
Box Canyon	1	GTR 8000 Base Radio Expandable Site Subsystem – 6 Talkpaths <ul style="list-style-type: none"> ◆ 4 GTR 8000 Simulcast Base Radios ◆ Redundant GCP8000 Controller with Embedded LAN Switches
	2	RGPS Timing Antenna/Receiver
	1	Combiner
	1	Tower Top Amplifier
	1	Receiver Multicoupler
	2	S2500 Multiprotocol WAN Router
	1	PTP58600 Ethernet Bridge Outdoor Unit (ODU)
	1	PTP58600 Power Indoor Unit (PIDU)
	1	MOSCAD RTU
	1	Marathon M12V40 Series 40 AH Battery Pack
	1	Eaton 9130 series 900W/1000VA UPS
		Antenna System
		<ul style="list-style-type: none"> ◆ 1 TX AND 1 RX Antennas ◆ 2 Microwave Dish Antennas ◆ CAT5 Cable and Connectors ◆ Transmission Line and Connectors ◆ Lightning Arrestors ◆ Ground Clamp Kits and Cable Weatherproofing



Table 6: ASTRO 25 Trunked Repeater Site Equipment

ASTRO 25 Trunked Repeater Site	Qty	Item Description
Road 62 Palo Verde Lake Hemet Billy Goat Snow Peak	1	GTR 8000 Base Radio Expandable Site Subsystem – 4 Talkpaths ◆ Redundant GCP 8000 Controllers with Embedded LAN Switches ◆ 3 GTR 8000 ASTRO 25 Base Radios
	1	Combiner
	1	Tower Top Amplifier
	1	Receiver Multicoupler
	2	S2500 Multiprotocol WAN Router
	1	PTP58600 Ethernet Bridge Outdoor Unit (ODU)
	1	PTP58600 Power Indoor Unit (PIDU)
	1	MOSCAD RTU
	1	Marathon M12V40 Series 40 AH Battery Pack
	1	Eaton 9130 series 900W/1000VA UPS
	1	Antenna System ◆ 1 TX and 1 RX Antennas ◆ 1 Microwave Dish Antenna at Road 62, Palo Verde and Lake Hemet ◆ 2 Microwave Dish Antennas at Billy Goat and Snow Peak ◆ CAT5 Cable and Connectors ◆ Transmission Line and Connectors ◆ Lightning Arrestors ◆ Ground Clamp Kits and Cable Weatherproofing



Table 7: Northwest Simulcast Cell Remote Site Equipment

Simulcast Remote Sites	Qty	Item Description
Paradise	1	GTR 8000 Base Radio Expandable Site Subsystem – 12 Talkpaths <ul style="list-style-type: none"> ◆ 7 GTR 8000 Simulcast Base Radios ◆ Redundant GCP8000 Controller with Embedded LAN Switches ◆ 2 X-Hubs
	2	RGPS Timing Antenna/Receiver
	2	Combiner
	1	Tower Top Amplifier
	1	Receiver Multicoupler
	2	S2500 Multiprotocol WAN Router
	1	MOSCAD RTU
	1	Eaton 9170 Series 7.5KW/9KVA UPS
	1	Antenna System <ul style="list-style-type: none"> ◆ 2 TX AND 1 RX Antennas ◆ Transmission Line and Connectors ◆ Lightning Arrestors ◆ Ground Clamp Kits and Cable Weatherproofing

1.3 Initial System Design Considerations

1.3.1 Master Sites

In addition to the licenses previously provided for under the Agreement, new licenses will be required for the master sites to accommodate the additional EC Sites and the Paradise site. Table 8 below summarizes the licensing requirements.

Table 8: Additional Master Site Items

Site Name	Site Type	Equipment
Alessandro	ASTRO 25 Primary Master Site	System Licenses for 10 Sites



1.3.2 Dynamic Frequency Blocking Feature (Voice Only)

Dynamic Frequency Blocking (DFB) prevents two interfering channels from being used at the same time in the same system. When geographically adjacent sites with significant coverage overlap are configured with an identical frequency, the system will block the assignment of the frequency at one of the sites when the other site has the frequency assigned. The DFB enabled channel will be blocked at the channel level not at the X2-TDMA (X2-TDMA is Motorola proprietary TDMA) level which means that if a frequency is being used at another site both X2-TDMA slots will be blocked.

Based on the attached frequency plan, this feature will not be required. However, this feature will be available if required and where appropriate for future use.

1.3.3 Frequency Plan

A 700 MHz frequency plan for the Enhanced Coverage System has been developed. The County 700 MHz frequency plan is provided in Appendix A - PSEC 700 MHz Frequency Plan.

Three frequency pairs have been identified for each of the EC sites with the exception of Box Canyon. The Box Canyon site will utilize the channels identified for the Indio Cell. This frequency plan is subject to change based on coordination agreements with co-channel agencies. Santa Rosa Cell is of particular interest and may require the County to pursue modifications to the Region 5 700 MHz National Plan.

The Paradise site will utilize the channels identified for the Northwest Cell.

1.3.4 Loading

A formal loading analysis was not conducted for the Enhanced Coverage System. All sites included in this phase are remote sites, and as such, the number of channels at each site is derived from the surrounding sites or cells. Careful fleetmap planning will be required to prevent users from accessing high elevation EC sites beyond intended areas.

Each EC site will be equipped with 3 channels. The exception is Box Canyon, which is equipped with 4 channels and will not require DFB. More details can be found in Table 1 above, indicating the number of channels assigned to each site.

1.3.5 Expansion

The System supports up to 100 sites per zone. Of these 100 sites, 64 can be simulcast cells. Note that simulcast cells, regardless of the number of sites per cell, count as one site. As part of the Enhanced Coverage System, the total number of overall System sites and cells is as follows:



- ◆ 21 – ASTRO 25 Trunked Repeater Sites
- ◆ 9 – Simulcast Cells
- ◆ 27 – HPD Sites

From the System perspective, the total System site count is 57 including the EC Sites. The System expansion capability after accounting for the Enhanced Coverage System is 43% of the first zone's capability for supporting additional sites, and the zone can be expanded in terms of sites whether they are ASTRO 25 trunked repeater sites, HPD sites, or simulcast cells. The System zone can accommodate up to 43 additional sites.

1.3.6 Network Transport

Two T1s will be required to provide connectivity between each of the following:

- ◆ RF simulcast prime site to each of its affiliated remote sites
- ◆ RF simulcast prime site to each Master site
- ◆ 700 MHz ASTRO 25 trunked repeater site to Master site

One of the two T1s from each site serves as the active T1 while a second T1 provides redundancy. Tables 9 and 10 below illustrate the bandwidth required to provide an efficient transport for system service at each site. The EC sites and the Paradise site are in bold font.

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Table 9: Simulcast Cells and Simulcast Remote Sites

Simulcast Cell	No. of Channels (CH.)	No. of CH. + 25% Growth	Talk Paths + 25% Growth	Simulcast Remote Site	Voice DS0s	HPD CH. + 100% Growth	HPD DS0s	Total DS0s per Site - IV&D & HPD	Total DS0s per Simulcast Prime Site - IV&D & HPD (Prime to Master)
Northwest Subsystem (14 Sub-sites) Prime Sites: Alessandro	7	9	16	Blue Mt.	5			5	9
				Box Springs	5	2	2	7	
				Riverside	5			5	
				Cajalco	5			5	
				Beacon Hill	5	2	2	7	
				Corona	5			5	
				Arlington	5			5	
				Glen Avon	5			5	
				Sunnyslope	5			5	
				Lake Mathews	5			5	
				Green River	5			5	
				Temescal	5			5	
				Marshall	5			5	
				Paradise	5			5	
Total DS0s (prime to remote sites)				70		4	74		
Desert Subsystem (3 Sub-sites) Prime Site: Black Jack	3	4	6	Black Jack	4			4	4
				Palen McCoy	4			4	
				Midland	4			4	
				Total DS0s (prime to remote sites)				12	
Santa Rosa Subsystem (2 Sub-sites) Prime Site: Santa Rosa Peak	3	4	6	Santa Rosa Peak	4			4	4
				Toro Peak	4			4	
				Total DS0s (prime to remote sites)				8	
Indio Subsystem (6 Sub-sites) Prime Site: Indio Control Point	4	5	8	Cactus City 1	4	2	2	6	8
				Cactus City 2	4			4	
				Indio Hill 1	4	2	2	6	
				Indio Hill 2	4			4	
				Mecca Landfill	4			4	
				Box Canyon	4			4	
				Total DS0s (prime to remote sites)				24	



Table 10: ASTRO 25 Trunked Repeater Sites

ASTRO 25 Trunked Repeater Site Name	HPD# of Channels	HPD DS0s	ASTRO 25 Trunked Repeater # of Channels	ASTRO 25 Trunked Repeater Total # of Channels + 25% Growth	ASTRO 25 Trunked Repeater Total # of Talkpaths + 25% Growth	ASTRO 25 Trunked Repeater DS0s	Total number of DS0s
Billy Goat	0	0	3	4	6	3	3
Lake Hemet	0	0	3	4	6	3	3
Palo Verde	0	0	3	4	6	3	3
Road 62	0	0	3	4	6	3	3
Snow Peak	0	0	3	4	6	3	3

1.3.7 Microwave Network

Nine new Point to Point (PTP) links will be implemented to interconnect the 9 EC Sites to the Initial Configuration microwave network sites. Seven of the nine new EC Sites employ a single PTP link to reach an “entry point” site into the Alcatel-Lucent (ALU) microwave network. Two of the nine EC Sites need to connect through a PTP site acting as relay sites. There are a total of 16 PTP equipped sites for the Enhanced Coverage System. Table 6 shows the daisy-chained PTP-only sites associated with each entry point site. Refer to Appendix B - Microwave Network Map for further details.

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Table 11: PTP Spur Interface to ALU Network Entry Point Sites

PSEC Initial Configuration Entry Point Site	PTP Sites Linked to Entry Point	
	1 st	2 nd
Black Jack	Midland	Palen McCoy
Cactus City	Toro Peak	Box Canyon
Santa Rosa Peak	Lake Hemet	
Blythe	Palo Verde	
Redondo Mesa	Billy Goat	
Blue Mountain	Snow Peak	
Road 177	Road 62	

The 5.8 GHz PTP600 Bridge will be used for these links and will be installed inside the equipment enclosure. Table 12 shows the installation parameters.



Table 12: Motorola Point-to-Point Paths

No.	Site Names	Dish Height (ft.)	Dish Size (ft. dia.)	Capacity Required	Capacity Provided	Availability	Frequency (GHz)
1	Palen McCoy	160	3	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
	Midland	20	3				
2	Midland	20	3	4 T1s + 4x 1.544Mbps; aggregate	4 T1s + >4x 1.544Mbps; aggregate	99.9999%	5.8
	Black Jack	40	3				
3	Box Canyon	40	6	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
		20	6				
	Toro Peak	45	4				
4	Toro Peak	30	6	4 T1s + 4x 1.544Mbps; aggregate	4 T1s + >4x 1.544Mbps; aggregate	99.9999%	5.8
		20	6				
	Cactus City	20	6				
5	Lake Hemet	20	4	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
	Santa Rosa Peak	50	3				
6	Palo Verde	50	4	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
		30	4				
	Blythe	30	4				
7	Billy Goat	60	6	2 T1s + >2x 1.544Mbps;	2 T1s + >2x 1.544Mbps;	99.9999%	5.8



No.	Site Names	Dish Height (ft.)	Dish Size (ft. dia.)	Capacity Required	Capacity Provided	Availability	Frequency (GHz)
		30	6	aggregate	aggregate		
	Redondo Mesa	40	6				
8	Snow Peak	60	4	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
		50	4				
	Blue Mountain	20	6				
9	Road 62	260	4	2 T1s + >2x 1.544Mbps; aggregate	2 T1s + >2x 1.544Mbps; aggregate	99.9999%	5.8
	Road 177	20	4				

The dish centerlines and/or sizes listed in the table above are subject to change based on final path surveys and any constructability findings that may arise.

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1.3.7.1 Impact on Initial Configuration Microwave Network

The new EC Sites increased the demands on the Initial Configuration microwave network. Table 13 shows the impacted paths. The majority of the paths absorbed the additional load without the need for overbuild or a change to a higher capacity path. However, the additional load diminished the unused capacity at each path*. Higher capacity radios or overbuild equipment that was needed to satisfy the EC site T1 requirements were provided in the Amendment 2 microwave reconciliation. Ancillary equipment (e.g. DSX, MUX) and PTP600 equipment will be provided at the 7 entry point sites as part of the EC site PTP equipment. The 7 entry point sites are listed in Table 11 above.



Table 13: Impact on Initial Configuration

Path	Action Required
New Paths	
Wiley's Well - Black Rock	Change radio from 16-T1 to 1-DS3
Corn Springs - Wiley's Well*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Corn Springs to Road 177	Change radio from 4-T1 to 8-T1
Santa Rosa Peak - Marion Ridge*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Existing Paths	
Blue Mountain – Alessandro*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Alessandro – Riverside*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Alessandro - Box Springs*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Alessandro - North Mountain*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Cactus City - Indio	Overbuild to add 1-DS3
Cactus City – Chuckwalla*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Black Rock – Chuckwalla*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Black Rock – Blythe*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.



Big Maria - Blythe	Overbuild to add 1-DS3
Santa Rosa Peak – Indio*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Santa Rosa Peak – Red Mountain*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Hemet - Red Mountain*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Hemet - North Mountain*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Hemet - Marion Ridge*	Allocate T1s on this path for EC Site traffic to alleviate full load on Santa Rosa Peak to Red Mountain to Hemet path.
Box Springs to Perris*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Perris to Elsinore Peak*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Elsinore Peak to Hemet*	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.
Redondo Mesa to Elsinore* Peak	Allocate T1s on this path for EC Site traffic. No new equipment required for the Enhanced Coverage System.

The 7 entry point sites, in addition to the PTP equipment, will require an Ethernet-to-T1 converter device. This is the interface and demarcation for the “Monitoring T1s” arriving at each of these sites from the linked PTP sites in the form of 1.544 Mbps of Ethernet throughput. The purpose for these Monitoring T1s in terms of PTP is to carry the SNMP alarm data from each of the PTP600 bridges (provided in the Enhanced Coverage System) to the existing TSM-8000 fault management server located at the Alessandro site. The County will provide the networking equipment (e.g. routers, switches) and its implementation necessary to perform the Ethernet-to-T1 conversion of the PTP600 SNMP alarm data and future undetermined physical site



monitoring data. This equipment will also, in the same manner, convert the Eltek DC system (“battery”) monitoring data where applicable.

PTP SNMP alarm, future site monitoring and Eltek DC system monitoring data traffic will be carried to the Alessandro site via the County’s CORNet network. The County will also provide new networking equipment and its implementation at various sites for purposes of routing the traffic through CORNet.

Sites where the networking equipment is required are:

1. Alessandro
2. Beacon Hill
3. Black Eagle
4. Black Jack
5. Black Rock
6. Blue Mountain
7. Blythe
8. Box Springs
9. Buena Vista (New Corona)
10. Cactus City
11. Clinton Keith
12. Corn Springs
13. Elsinore Peak
14. Hemet
15. Indio
16. Line
17. Mt David
18. North Mountain
19. Ranger Peak
20. Redondo Mesa
21. Riverside
22. Road 177
23. Santa Rosa Peak
24. Santiago Peak
25. Vidal Junction
26. Wiley’s Well



For PTP600 local access and any future physical site monitoring data collection, the County will need to provide the appropriate network equipment and implementation.

Additional PTP dishes will be installed at Initial Configuration Sites to support the EC PTP links. These additional dishes will reduce the growth space reserved on the towers of the Initial Configuration Sites.

An Ethernet switch and an IP MUX will be installed at Midland, Black Jack, Toro Peak and Cactus City. The IP MUX is needed in order to pass more than two T1s



through the PTP600 path. The Ethernet switch is needed to provide the prioritization that the ASTRO radio data requires over the PTP SNMP and site monitoring data.

1.4 Site Design

1.4.1 Outdoor Enclosures

Pepro CLP enclosures will be used for all 9 EC Sites. These aluminum welded enclosures are designed with Faraday Cage technology, and they are fully equipped to support the radio and ancillary equipment for both ASTRO 25 sites and simulcast remote sites. A 4-bay CLP enclosure will be implemented at each site to support five 24-RU racks.

Appendix C - Drawings includes enclosure equipment rack face layouts. Appendix D – Site Supporting Documents includes specifications for the enclosures and CMU wall details. Final drawings will be provided prior to permitting.

All EC sites being provided with the Pepro enclosures will have a chain link fence around the compound. The chain link fence will be 8' high with two 6' wide gates. In addition, the enclosures will be surrounded on three sides by a 6' CMU wall.

1.4.2 Site Power

EC sites will be powered by either commercial or diesel generator power and have an additional generator backup. Table 14 provides the detailed configuration for each site.

Table 14: Site Power Requirements

Proposed Site	Final Design Site	Original Power Design	Final Power Design
Box Canyon	Box Canyon	Commercial Power with Propane Backup Generator	Dual Diesel Primary Power Generators
High Point	Billy Goat	Commercial Power with Propane Backup Generator	Commercial Power with Propane Backup Generator
Lake Hemet	Lake Hemet	N/A	Commercial Power with Propane Backup Generator
Thomas Mtn	Deleted	N/A	N/A
Toro Peak	Toro Peak	N/A	Commercial Power with Propane Backup Generator
Snow Peak	Snow Peak	N/A	Commercial Power with Propane Backup Generator

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Proposed Site	Final Design Site	Original Power Design	Final Power Design
Palen McCoy	Palen McCoy	Commercial Power with Propane Backup Generator	Dual Diesel Primary Power Generators
CalTrans	Road 62	N/A	Dual Diesel Primary Power Generators
Midland	Midland	Commercial Power with Propane Backup Generator	Dual Diesel Primary Power Generators
Palo Verde	Palo Verde	N/A	Dual Diesel Primary Power Generators

In the event of a power failure, 25 kW propane powered generators are used to supply backup power to the EC Sites utilizing commercial primary power. These sites are Billy Goat, Lake Hemet, Toro Peak, and Snow Peak. The remaining EC Sites will utilize 30 kW dual diesel primary power generators. Propane powered generators have a 500 gallon capacity while the diesel tanks have 2000 gallon capacity. During the generator switchover, the site equipment is either powered by a battery pack or a UPS.

The Marathon M12V40 series 40 ampere-hour battery pack supplies interim DC power to the GTR 8000 base radios and site controllers while the softwired Eaton 9130 series 900W/1000VA UPS and additional battery module keep the ancillary and PTP equipment operational during the switchover. An isolation transformer is not required for the provided UPS.

1.4.3 Towers

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The coverage and PTP designs dictated the required tower heights for the EC sites. The table below outlines the type and height of tower required at each of the EC sites.

Table 15: Coverage Enhancement Site Tower Heights

Site	Type of Tower	Tower Height
Palen McCoy	Guyed	330'
Midland	Self-Supporting	80'
Toro Peak	Self-Supporting	60'
Box Canyon	Self-Supporting	80'
Road 62	Self-Supporting	250'
Palo Verde	Self-Supporting	100'
Lake Hemet	Self-Supporting	100'
Billy Goat	Self-Supporting	80'
Snow Peak	Self-Supporting	100'



The Road 62 tower height is subject to change based on final path surveys. The Paradise site will utilize an existing County leased tower.

1.4.4 Drawings

Rack face, Pepro enclosure, and RF interconnect drawings are included in the Appendix C- Drawings.

1.5 Coverage Design

The Coverage Maps being provided are composite coverage predictions of both the Initial Configuration and EC Sites. The final EC site locations are identified in Table 16 below. The current locations for the Initial Configuration Sites have been incorporated in the 700 MHz coverage design.

1.5.1 Maps

The updated coverage maps are based on current locations, as well as plotting of High Priority Building locations. In addition to portable coverage maps, maps will be provided depicting mobile (700 MHz and VHF) coverage. The mobile coverage layers will be overlaid with portable on street on hip coverage layers, which depict areas where the DVRS may be required. The coverage map layers will be delivered in shape file format for informational purposes only.

The following four maps are included in Appendix E – Coverage Maps:

- ◆ Four layer uplink map depicting the composite inbound coverage from the Initial Configuration Sites and the new Enhanced Coverage System, including simulcast cells and ASTRO 25 Trunked Repeater sites. The Portable on Street (VHF and 700 MHz), 10 dB and 20 dB layers are included on this map. Each layer is represented in a different color.
- ◆ Four layer downlink map depicting the composite outbound coverage from the Initial Configuration Sites and the new Enhanced Coverage System, including simulcast cells and ASTRO 25 Trunked Repeater sites. The Portable on Street (VHF and 700 MHz), 10 dB and 20 dB layers are included on this map. Each layer is represented in a different color.
- ◆ Six layer uplink composite map depicting all the portable layers noted above plus the mobile layers for the 700 MHz and VHF bands.
- ◆ Six layer downlink composite map depicting all the portable layers noted above plus the mobile layers for the 700 MHz and VHF bands.

Note: The Initial Configuration Sites included Lost Horse and Cottonwood. These sites have been removed as part of the



Enhanced Coverage System therefore coverage from these two eliminated sites is not included.

Prior to commencing the overall System CATP, a revised Coverage Map(s) with the final System site locations and implementation parameters resulting from System optimization, will be delivered to the County. This is the map that will be used to create grid maps for the System CATP as defined in Attachment ATP.

1.5.2 Coverage Parameters

The following are the RF parameters used for creating the coverage maps mentioned in section 1.5.1 with the additional 9 EC Sites and Paradise site. These maps were produced based on the following criteria:

1. 95% reliability
2. Delivered Audio Quality (DAQ) of 3.4
3. Portable subscriber antenna height: transmit and receive on hip level
4. Mobile subscriber antenna height: transmit and receive on the roof of a sedan

Note: 95% Reliability indicates that 95% of the painted area will achieve DAQ 3.4 or better in the direction indicated on the map as measured by the System CATP.

Table 16: EC Sites and Paradise Site Parameters

Site No.	Site Name	Latitude (N)	Longitude (W)	Tx Antenna Type	Rx Antenna Type	Tx Antenna Height (ft)	Rx Antenna Height (ft)	ERP (W)
1	Lake Hemet	33 40 19.76	116 41 7.76	BCD-7509	BCD-7509	82	100	174
2	Road 62	34 2 47.5	115 13 16.5	BPS10-A	BPS10-A	81	100	339
3	Billy Goat	33 27 58	116 51 26	BCD-7506-5-25	BCD-7506-5-25	67	80	30
4	Palo Verde	33 26 42.6	114 48 33.3	BPS10-A	BPS10-A	81	100	372
5	Box Canyon	33 36 49.8	115 54 46.5	SC412-HF2LDF(D02-E5608)	SC412-HF2LDF(D02-E5608)	54	80	324
6	Midland	33 50 26	114 57 19.9	SC412-HF2LDF	SC412-HF2LDF	54	80	324
7	Palen McCoy	33 55 16.6	115 01 26.1	SC412-HF2LDF	SC412-HF2LDF	304	330	240
8	Toro Peak	33 31 24.7	116 25 32.6	WPA-700102-4CF-9	WPA-700102-4CF-9	41	50	65
9	Snow Peak	34 2 15.5	116 48 48.1	WPA-700102-2CF-2	WPA-700102-2CF-2	93	100	33
10	Paradise*	33 55 11.99	117 31 35.81	DB844H90E-A_770H_ODG	SC412-HF2LDF(D02-E5608)_0746	50	60	359



* Note: Final Paradise site coordinates, antenna placements and heights will be determined upon County confirmation.

1.6 Transportable Digital Vehicular Repeater (DVRS)

After further discussions with the County regarding the operational and hardware requirements for vehicle mounted DVRS units, it was agreed that Transportable DVRS units would be better suited for unique deployments. Two Transportable units are being provided, one in-band and one cross-band. The in-band unit will be for 700 MHz in-band operation and the cross-band will be for VHF to 700 MHz operation. The cross-band unit would be suitable for situations where VHF mobile coverage is available and the portable subscriber units are operating in the 700 MHz band to talk back to the DVRS.

The Transportable DVRS units are expected to be utilized in areas where only mobile coverage is available. The mobile radio interfaced to the DVRS will only operate in FDMA when the DVRS is in use. The APX interface to the DVRS is expected to be available in Q4 of 2012.

The Transportable DVRS is packaged in a durable suitcase and includes all necessary electronics and filtering. The Transportable unit can be easily deployed in the field and is powered up either by plugging into an AC outlet or by using a battery backup kit, which is being provided. The battery backup kit is also packaged in a suitcase for ease of transportation and provides 2 hours of backup operation. The Transportable DVRS requires two antennas - one connected to the APX mobile radio and one to the DVR. The APX mobile radio antenna needs to be strategically deployed in order to ensure reliable link between the APX mobile radio and the radio System. The DVR antenna needs to be positioned to provide optimum radio coverage for the portable subscriber users.

Manual intervention will require the user to switch to a DVRS channel on their portable subscriber. 700 MHz frequency pairs will need to be identified for conventional channel use for the DVRS operation. This will need to be factored into the fleetmap and subscriber templates. Once the DVRS units have been shipped, the operational band configuration remains permanent. Note that a portable radio that is operating through a DVRS will not be capable of Over The Air Programming (OTAP), Over The Air Re-Keying (OTAR), and location tracking services.

The following are the Transportable DVRS general specifications:

- ◆ 20.6" H x 17" W x 8.6" D
- ◆ 48.5 lbs
- ◆ Supports up to 64 channels
- ◆ Programmable output power is 1-10 Watts at antenna port



The following are the Battery Pack and Charger Kit general specifications:

- ◆ Battery Pack: 9.65” H x 11” W x 6.9” D
- ◆ Charger: 2” H x 5” W x 4.9” D
- ◆ Battery Pack: 28.5 lbs
- ◆ Charger: 4 lbs
- ◆ 10 hr charging time

The following figures depict a typical setup for a Transportable DVRS and battery pack.



Figure 1: Transportable DVRS Suitcase and Battery Kit

PUBLIC SAFETY ENTERPRISE COMMUNICATION

*Creating the Next-Generation Communication System
for the County of Riverside*

1.7 Acceptance Test Plan

1.7.1 Point-to-Point Proof of Performance

The PTP Acceptance Test Plan included in Appendix F – ATPs will be performed for the EC site PTP paths.

In addition, a ten day proof of performance test will be conducted for the simulcast remote sites. This ten day proof of performance test will include monitoring of the path to determine if any degradation causes loss of critical voice communication.

1.7.2 Dynamic Frequency Blocking

The DFB Acceptance Test Plan included in Appendix F will be performed to test the aforementioned system feature.



1.7.3 Coverage Acceptance Test Plan

EC system coverage will be tested at the same time as the Initial Configuration System Coverage. The Paradise site will be tested separately after the System CATP has been completed. The Coverage Acceptance Test will be performed for portable on-street coverage in the NW simulcast cell only.

A test of the roaming feature will be updated and agreed upon prior to the actual start of the CATP.

1.7.4 DVRS Functional Test

The DVRS ATP included in Appendix F will be performed to test the functionality of the DVRS. This test will prove that a user can select a DVRS channel from a portable subscriber and utilize the DVRS to talk back into the System.

1.8 Cutover

The EC Sites implementation will be incorporated into the overall cutover schedule of the Initial Configuration System Sites. This will minimize the impact to users during the Enhanced Coverage System integration. For example, the Santa Rosa cell includes one site that was initially an ASTRO 25 trunked repeater site and has been configured as a simulcast cell as part of the initial System implementation.

In addition to the above considerations, there are sites in the Enhanced Coverage System design that need to be constructed ahead of the others. The sites provide the critical link into the initial System microwave network design. The following is the recommended order of priority.

1. Toro Peak (provides a critical link for Box Canyon)
2. Midland (provides a PTP link for Palen McCoy)

1.9 Assumptions

The following assumptions have been made for the implementation of Enhanced Coverage System sites.

1. The County will acquire sufficient 700 MHz spectrum to implement the design for the System (initial System and Enhanced Coverage System).
2. The County will provide networking equipment (e.g. routers, switches) for battery and site monitoring as required for PTP site.
3. A 60 day reliability test is not required for the Enhanced Coverage System. Contracted warranties shall apply.
4. Sites in this document are current per Table 16 above.



5. Site acquisitions, construction, and installations will be completed per the schedule included in Appendix G - Schedule.
6. County provided networking equipment will be installed and operational to meet attached schedule.
7. Spectrum licensing is granted prior to system optimization.
8. CATP coverage maps are accepted.
9. Frequency pairs for the DVRS 's will be identified prior to cutover.

The following assumptions have been made for the implementation of the Paradise Site.

1. The installation work will be performed after initial System is operational and Cutover is complete. The existing radio equipment and antennas will be removed to make space for the new equipment.
2. Microwave connectivity is expected to be provided by the County's existing microwave system and will perform in accordance the contract specifications (6 nines reliability).
3. Documentation updates related to this site addition will be performed as part of the as-built process.
4. Additional system-level Acceptance Tests will not be performed.
5. County witnessed staging Acceptance testing will not be required.
6. Shelter and tower space will be the responsibility of the County.
7. There will be sufficient space in the existing shelter and on the tower.
8. County to obtain all required permitting to install antenna system and equipment in shelter.
9. A tower analysis, if required, is a County responsibility.
10. Tower and shelter upgrades are not included.
11. The site installation will utilize the existing external grounding system. Testing or verification of the existing external grounding system is not included, and no provisions have been included to replace or modify the external grounding system.
12. The Coverage Acceptance Test will be performed for portable on-street coverage in the NW simulcast cell only.



Channel Numbers in Green are U.S. Primary, in Pink are Mexico Primary

CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
1			769.003125		769.0125	Low power								
2			769.009375			Low power								
3			769.015625			Low power								
4			769.021875			Low power								
5			769.028125		769.0375	Low power								
6			769.034375			Low power								
7			769.040625			Low power								
8			769.046875			Low power								
9			769.053125		769.0625	Low power								
10			769.059375			Low power								
11			769.065625			Low power								
12			769.071875			Low power								
13		1	769.078125	2	769.0875	General Use	San Diego County - West	Riverside County - East	Ventura County	CHUCKWALLA	TIMOTEO HPD		Yuma Co.	
14			769.084375			General Use	San Diego County - West	Riverside County - East	Ventura County	CHUCKWALLA	TIMOTEO HPD		Yuma Co.	
15		3	769.090625			General Use	San Diego County - West	Riverside County - East	Ventura County	INDIO CELL	TIMOTEO HPD		Yuma Co.	
16			769.096875			General Use	San Diego County - West	Riverside County - East	Ventura County	INDIO CELL	TIMOTEO HPD		Yuma Co.	
17		4	769.103125	5	769.1125	General Use	San Diego County - West	Riverside County - East	Los Angeles County	BLYTHE CELL				
18			769.109375			General Use	San Diego County - West	Riverside County - East	Los Angeles County	BLYTHE CELL				
19		6	769.115625			General Use	San Diego County - West	Riverside County - East	Los Angeles County	LINE	LAKE RIVERSIDE			
20			769.121875			General Use	San Diego County - West	Riverside County - East	Los Angeles County	LINE	LAKE RIVERSIDE			
21			769.128125		769.1375	Secondary Trunking								
22			769.134375			Secondary Trunking								
23			769.140625			Interoperability								
24			769.146875			Interoperability								
25			769.153125		769.1625	State license								
26			769.159375			State license								
27			769.165625			State license								
28			769.171875			State license								
29			769.178125		769.1875	State license								
30			769.184375			State license								
31			769.190625			State license								
32			769.196875			State license								
33			769.203125		769.2125	State license								
34			769.209375			State license								
35			769.215625			State license								
36			769.221875			State license								
37			769.228125		769.2375	Reserve								
38			769.234375			Reserve								
39			769.240625			NO Nationwide Call								
40			769.246875			NO Nationwide Call								
41			769.253125		769.2625	General Use	San Diego County	Los Angeles County						
42			769.259375			General Use	San Diego County	Los Angeles County						
43			769.265625			General Use	San Diego County	Los Angeles County						
44			769.271875			General Use	San Diego County	Los Angeles County						
45		7	769.278125	8	769.2875	General Use	Imperial County	Riverside County - West	Ventura County	SOUTHWEST CELL			Kings Co.	
46			769.284375			General Use	Imperial County	Riverside County - West	Ventura County	SOUTHWEST CELL			Tulare Co.	
47		9	769.290625			General Use	Imperial County	Riverside County - West	Ventura County	SANTA ROSA CELL			Tulare Co.	
48			769.296875			General Use	Imperial County	Riverside County - West	Ventura County	SANTA ROSA CELL			Tulare Co.	
49		10	769.303125	11	769.3125	General Use	San Diego City	Riverside County - East	Los Angeles County	BLYTHE CELL				
50			769.309375			General Use	San Diego City	Riverside County - East	Los Angeles County	BLYTHE CELL				
51		12	769.315625			General Use	San Diego City	Riverside County - East	Los Angeles County	INDIO CELL	BILLY GOAT			
52			769.321875			General Use	San Diego City	Riverside County - East	Los Angeles County	INDIO CELL	BILLY GOAT			
53			769.328125		769.3375	General Use	San Diego County	San Bernardino County - West					Mojave Co.	
54			769.334375			General Use	San Diego County	San Bernardino County - West					Mojave Co.	
55			769.340625			General Use	San Diego County	San Bernardino County - West					Mojave Co.	
56			769.346875			General Use	San Diego County	San Bernardino County - West					Mojave Co.	
57			769.353125		769.3625	General Use	San Diego County		Los Angeles City					
58			769.359375			General Use	San Diego County		Los Angeles City					
59			769.365625			General Use	San Diego County		Los Angeles City					
60			769.371875			General Use	San Diego County		Los Angeles City					
61			769.378125		769.3875	Reserve								
62			769.384375			Reserve								
63			769.390625			Interoperability								
64			769.396875			Interoperability								
65			769.403125		769.4125	State license								
66			769.409375			State license								
67			769.415625			State license								
68			769.421875			State license								
69			769.428125		769.4375	State license								
70			769.434375			State license								
71			769.440625			State license								
72			769.446875			State license								
73			769.453125		769.4625	State license								
74			769.459375			State license								
75			769.465625			State license								
76			769.471875			State license								
77			769.478125		769.4875	Reserve								
78			769.484375			Reserve								
79			769.490625			Interoperability								
80			769.496875			Interoperability								
81			769.503125		769.5125	General Use	San Diego City	Los Angeles County						
82			769.509375			General Use	San Diego City	Los Angeles County						
83			769.515625			General Use	San Diego City	Los Angeles County						
84			769.521875			General Use	San Diego City	Los Angeles County						
85		13	769.528125	14	769.5375	General Use	Imperial County	Riverside County - West	Ventura County	SOUTHWEST CELL			Monterey Co.	
86			769.534375			General Use	Imperial County	Riverside County - West	Ventura County	SOUTHWEST CELL			Monterey Co.	
87		15	769.540625			General Use	Imperial County	Riverside County - West	Ventura County	SANTA ROSA CELL				
88			769.546875			General Use	Imperial County	Riverside County - West	Ventura County	SANTA ROSA CELL				
89		16	769.553125	17	769.5625	General Use	San Diego City	Riverside County - East	Los Angeles County	BLYTHE CELL				
90			769.559375			General Use	San Diego City	Riverside County - East	Los Angeles County	BLYTHE CELL				
91		18	769.565625			General Use	San Diego City	Riverside County - East	Los Angeles County	INDIO CELL	BILLY GOAT			

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CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
274	770.709375				State license									
275	770.715625		770.71875		State license									
276	770.721875				State license									
277	770.728125		770.73125		770.7375 Reserve									
278	770.734375				770.7375 Reserve									
279	770.740625		770.74375		I/O low speed data									
280	770.746875				I/O low speed data									
281	770.753125	40	770.75625	41	770.7625	General Use	San Diego City	Los Angeles County	Riverside County - East	CORN SPRINGS HPD	SANTA ROSA PEAK HPD			
282	770.759375				General Use	San Diego City	Los Angeles County	Los Angeles County	Riverside County - East	CORN SPRINGS HPD	SANTA ROSA PEAK HPD			
283	770.765625	42	770.76875		General Use	San Diego City	Los Angeles County	Los Angeles County	Riverside County - East	CORN SPRINGS HPD	SANTA ROSA PEAK HPD			
284	770.771875				General Use	San Diego City	Los Angeles County	Los Angeles County	Riverside County - East	CORN SPRINGS HPD	SANTA ROSA PEAK HPD			
285	770.778125		770.78125		770.7875	General Use	Imperial County	Orange County	City of Simi Valley					
286	770.784375				General Use	Imperial County	Orange County	Orange County	City of Simi Valley					
287	770.790625		770.79375		General Use	Imperial County	Orange County	Orange County	City of Simi Valley					
288	770.796875				General Use	Imperial County	Orange County	Orange County	City of Simi Valley					
289	770.803125	43	770.80625	44	770.8125	General Use	San Diego City	Riverside County - East	Los Angeles County	BANNING HPD	CACTUS CITY HPD	BIG MARIA HPD	LAKE RIVERSIDE	Tulare Co.
290	770.809375				General Use	San Diego City	Riverside County - East	Los Angeles County	BANNING HPD	CACTUS CITY HPD	BIG MARIA HPD	LAKE RIVERSIDE		Tulare Co.
291	770.815625	45	770.81875		General Use	San Diego City	Riverside County - East	Los Angeles County	BANNING HPD	CACTUS CITY HPD	BIG MARIA HPD	LAKE RIVERSIDE		Tulare Co.
292	770.821875				General Use	San Diego City	Riverside County - East	Los Angeles County	BANNING HPD	CACTUS CITY HPD	BIG MARIA HPD	LAKE RIVERSIDE		Tulare Co.
293	770.828125		770.83125		770.8375	General Use	San Diego County	San Bernardino County						
294	770.834375				General Use	San Diego County	San Bernardino County							
295	770.840625		770.84375		General Use	San Diego County	San Bernardino County							
296	770.846875				General Use	San Diego County	San Bernardino County							
297	770.853125		770.85625		770.8625	General Use	San Diego County		Los Angeles City				Mojave Co.	Monterey Co.
298	770.859375				General Use	San Diego County		Los Angeles City					Mojave Co.	Monterey Co.
299	770.865625		770.86875		General Use	San Diego County		Los Angeles City					Mojave Co.	
300	770.871875				General Use	San Diego County		Los Angeles City					Mojave Co.	
301	770.878125		770.88125		770.8875 Reserve									
302	770.884375				770.8875 Reserve									
303	770.890625		770.89375		Interoperability									
304	770.896875				Interoperability									
305	770.903125		770.90625		770.9125	State license								
306	770.909375				State license									
307	770.915625		770.91875		State license									
308	770.921875				State license									
309	770.928125		770.93125		770.9375	State license								
310	770.934375				State license									
311	770.940625		770.94375		State license									
312	770.946875				State license									
313	770.953125		770.95625		770.9625	State license								
314	770.959375				State license									
315	770.965625		770.96875		State license									
316	770.971875				State license									
317	770.978125		770.98125		770.9875 Reserve									
318	770.984375				770.9875 Reserve									
319	770.990625		770.99375		Interoperability									
320	770.996875				Interoperability									
321	771.003125		771.00625		771.0125	General Use	San Diego City	Los Angeles County						
322	771.009375				General Use	San Diego City	Los Angeles County							
323	771.015625		771.01875		General Use	San Diego City	Los Angeles County							
324	771.021875				General Use	San Diego City	Los Angeles County							
325	771.028125	46	771.03125	47	771.0375	General Use	Riverside County	Riverside County	CHUCKWALLA	REDONDO MESA HPD				
326	771.034375				General Use	Riverside County	Riverside County	CHUCKWALLA	CHUCKWALLA	REDONDO MESA HPD				
327	771.040625	48	771.04375		General Use	Riverside County	Riverside County			REDONDO MESA HPD				
328	771.046875				General Use	Riverside County	Riverside County			REDONDO MESA HPD				
329	771.053125	49	771.05625	50	771.0625	General Use	San Diego City	Riverside County - East	Los Angeles County	RICE	LAKE HEMET	MORONGO		Tulare Co.
330	771.059375				General Use	San Diego City	Riverside County - East	Los Angeles County	Los Angeles County	RICE	LAKE HEMET	MORONGO		Tulare Co.
331	771.065625	51	771.06875		General Use	San Diego City	Riverside County - East	Los Angeles County	NORTHWEST CELL					Tulare Co.
332	771.071875				General Use	San Diego City	Riverside County - East	Los Angeles County	NORTHWEST CELL					Tulare Co.
333	771.078125		771.08125		771.0875	General Use	San Diego County	San Bernardino County						
334	771.084375				General Use	San Diego County	San Bernardino County							
335	771.090625		771.09375		General Use	San Diego County	San Bernardino County							
336	771.096875				General Use	San Diego County	San Bernardino County							Monterey Co.
337	771.103125		771.10625		771.1125	General Use	San Diego County		Los Angeles City					Monterey Co.
338	771.109375				General Use	San Diego County		Los Angeles City						Inyo Co.; Kings Co.
339	771.115625		771.11875		General Use	San Diego County		Los Angeles City						Inyo Co.; Kings Co.
340	771.121875				General Use	San Diego County		Los Angeles City						Inyo Co.; Kings Co.
341	771.128125	52	771.13125	53	771.1375	General Use	Riverside County		CHUCKWALLA	RED MTN.				Monterey Co.
342	771.134375				General Use	Riverside County			CHUCKWALLA	RED MTN.				Monterey Co.
343	771.140625	54	771.14375		General Use	Riverside County			SOUTHWEST CELL	PALO VERDE				Monterey Co.
344	771.146875				General Use	Riverside County			SOUTHWEST CELL	PALO VERDE				Monterey Co.
345	771.153125		771.15625		771.1625	General Use		Orange County						
346	771.159375				General Use			Orange County						
347	771.165625		771.16875		General Use			Orange County						
348	771.171875				General Use			Orange County						
349	771.178125	55	771.18125	56	771.1875	General Use	Riverside County		CHUCKWALLA				Yuma Co.	
350	771.184375				General Use	Riverside County			CHUCKWALLA				Yuma Co.	
351	771.190625	57	771.19375		General Use	Riverside County			SANTIAGO PK				Yuma Co.	
352	771.196875				General Use	Riverside County			SANTIAGO PK				Yuma Co.	
353	771.203125		771.20625		771.2125	General Use	CSU	City of Simi Valley						Monterey Co.
354	771.209375				General Use	CSU	City of Simi Valley							Monterey Co.
355	771.215625		771.21875		General Use	CSU	City of Simi Valley							Tulare Co.
356	771.221875				General Use	CSU	City of Simi Valley							Tulare Co.
357	771.228125		771.23125		771.2375	General Use	Los Angeles County							Monterey Co.
358	771.234375				General Use	Los Angeles County								Monterey Co.
359	771.240625		771.24375		General Use	Los Angeles County								Monterey Co.
360	771.246875				General Use	Los Angeles County								Tulare Co.
361	771.253125		771.25625		771.2625	General Use	San Diego City		Los Angeles City				Mojave Co.	
362	771.259375				General Use	San Diego City		Los Angeles City					Mojave Co.	
363	771.265625		771.26875		General Use	San Diego City		Los Angeles City					Mojave Co.	
364	771.271875				General Use	San Diego City		Los Angeles City					Mojave Co.	

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CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
365	771.278125		771.28125		771.2875	General Use	Imperial County	Orange County						Tulare Co.
366	771.284375					General Use	Imperial County	Orange County						Tulare Co.
367	771.290625		771.29375			General Use	Imperial County	Orange County						Monterey Co.
368	771.296875					General Use	Imperial County	Orange County						Monterey Co.
369	771.303125	58	771.30625	59	771.3125	General Use		Riverside County	BLYTHE CELL	LAKE HEMET				
370	771.309375					General Use		Riverside County	BLYTHE CELL	LAKE HEMET				
371	771.315625	60	771.31875			General Use		Riverside County	NORTHWEST CELL	LINE				Tulare Co.
372	771.321875					General Use		Riverside County	NORTHWEST CELL	LINE				Tulare Co.
373	771.328125	61	771.33125	62	771.3375	General Use	San Diego County	Riverside County - East	Los Angeles County	BLACK JACK HPD				
374	771.334375					General Use	San Diego County	Riverside County - East	Los Angeles County	BLACK JACK HPD				
375	771.340625	63	771.34375			General Use	San Diego County	Riverside County - East	Los Angeles County	BLACK JACK HPD				
376	771.346875					General Use	San Diego County	Riverside County - East	Los Angeles County	BLACK JACK HPD	SNOW PEAK			
377	771.353125		771.35625		771.3625	General Use	San Diego County	San Bernardino County - West					La Paz Co.	Tulare Co.
378	771.359375					General Use	San Diego County	San Bernardino County - West					La Paz Co.	Tulare Co.
379	771.365625		771.36875			General Use	San Diego County	San Bernardino County - West					La Paz Co.	Monterey Co.; Tulare Co.
380	771.371875					General Use	San Diego County	San Bernardino County - West					La Paz Co.	Monterey Co.; Tulare Co.
381	771.378125	64	771.38125	65	771.3875	General Use	Riverside County		PALM SPRINGS CELL	RICE				
382	771.384375					General Use	Riverside County		PALM SPRINGS CELL	RICE				
383	771.390625	66	771.39375			General Use	Riverside County		SOUTHWEST CELL	CHUCKWALLA				
384	771.396875					General Use	Riverside County		SOUTHWEST CELL	CHUCKWALLA				
385	771.403125		771.40625		771.4125	General Use			Orange County					
386	771.409375					General Use			Orange County					
387	771.415625		771.41875			General Use			Orange County					
388	771.421875					General Use			Orange County					
389	771.428125	67	771.43125	68	771.4375	General Use			Riverside County	DESERT CELL	RED MTN.			
390	771.434375					General Use			Riverside County	DESERT CELL	RED MTN.			
391	771.440625	69	771.44375			General Use			Riverside County	SOUTHWEST CELL	PALO VERDE			
392	771.446875					General Use			Riverside County	SOUTHWEST CELL	PALO VERDE			
393	771.453125		771.45625		771.4625	General Use	Long Beach Transit							
394	771.459375					General Use	Long Beach Transit							
395	771.465625		771.46875			General Use	Long Beach Transit							
396	771.471875					General Use	Long Beach Transit							
397	771.478125		771.48125		771.4875	General Use	San Diego City	Los Angeles County						
398	771.484375					General Use	San Diego City	Los Angeles County						
399	771.490625		771.49375			General Use	San Diego City	Los Angeles County						
400	771.496875					General Use	San Diego City	Los Angeles County						
401	771.503125		771.50625		771.5125	General Use	Palos Verdes Estates		City of Simi Valley					Inyo Co.; Monterey Co.
402	771.509375					General Use	Palos Verdes Estates		City of Simi Valley					Inyo Co.; Monterey Co.
403	771.515625		771.51875			General Use	Palos Verdes Estates		City of Simi Valley					Inyo Co.
404	771.521875					General Use	Palos Verdes Estates		City of Simi Valley					Inyo Co.
405	771.528125		771.53125		771.5375	General Use			Orange County					
406	771.534375					General Use			Orange County					
407	771.540625		771.54375			General Use			Orange County					
408	771.546875					General Use			Orange County					
409	771.553125	70	771.55625	71	771.5625	General Use			Riverside County	ROAD 177	VIDAL JUNCTION		Mojave Co.	
410	771.559375					General Use			Riverside County	ROAD 177	VIDAL JUNCTION		Mojave Co.	
411	771.565625	72	771.56875			General Use			Riverside County	SNOW PEAK			Mojave Co.	
412	771.571875					General Use			Riverside County	SNOW PEAK			Mojave Co.	
413	771.578125		771.58125		771.5875	General Use			Los Angeles County					Yuma Co.
414	771.584375					General Use			Los Angeles County					Yuma Co.
415	771.590625		771.59375			General Use			Los Angeles County					Yuma Co.
416	771.596875					General Use			Los Angeles County					Yuma Co.
417	771.603125		771.60625		771.6125	General Use	Long Beach Transit	San Bernardino County						Monterey Co.
418	771.609375					General Use	Long Beach Transit	San Bernardino County						Monterey Co.
419	771.615625		771.61875			General Use	Long Beach Transit	San Bernardino County						
420	771.621875					General Use	Long Beach Transit	San Bernardino County						
421	771.628125	73	771.63125	74	771.6375	General Use	Riverside County		IRON MTN.	LINE				
422	771.634375					General Use	Riverside County		IRON MTN.	LINE				
423	771.640625	75	771.64375			General Use	Riverside County		SAN JACINTO CELL					
424	771.646875					General Use	Riverside County		SAN JACINTO CELL					
425	771.653125		771.65625		771.6625	General Use			Orange County					Tulare Co.
426	771.659375					General Use			Orange County					Tulare Co.
427	771.665625		771.66875			General Use			Orange County					Monterey Co.; Tulare Co.
428	771.671875					General Use			Orange County					Monterey Co.; Tulare Co.
429	771.678125	76	771.68125	77	771.6875	General Use			Riverside County	RICE				
430	771.684375					General Use			Riverside County	RICE				
431	771.690625	78	771.69375			General Use			Riverside County	SAN JACINTO CELL	PALO VERDE			Tulare Co.
432	771.696875					General Use			Riverside County	SAN JACINTO CELL	PALO VERDE			Tulare Co.
433	771.703125		771.70625		771.7125	General Use	State of CA/EMS Authority							
434	771.709375					General Use	State of CA/EMS Authority							
435	771.715625		771.71875			General Use	State of CA/EMS Authority							
436	771.721875					General Use	State of CA/EMS Authority							
437	771.728125		771.73125		771.7375	General Use	Los Angeles County						La Paz Co.	
438	771.734375					General Use	Los Angeles County						La Paz Co.	
439	771.740625		771.74375			General Use	Los Angeles County						La Paz Co.	
440	771.746875					General Use	Los Angeles County						La Paz Co.	
441	771.753125		771.75625		771.7625	General Use			San Bernardino County					
442	771.759375					General Use			San Bernardino County					
443	771.765625		771.76875			General Use			San Bernardino County					
444	771.771875					General Use			San Bernardino County					
445	771.778125		771.78125		771.7875	General Use			Orange County					Inyo Co.
446	771.784375					General Use			Orange County					Inyo Co.
447	771.790625		771.79375			General Use			Orange County					Inyo Co.
448	771.796875					General Use			Orange County					Inyo Co.
449	771.803125	79	771.80625	80	771.8125	General Use			Riverside County	RICE	LINE			
450	771.809375					General Use			Riverside County	RICE	LINE			
451	771.815625	81	771.81875			General Use			Riverside County	SAN JACINTO CELL				
452	771.821875					General Use			Riverside County	SAN JACINTO CELL				
453	771.828125		771.83125		771.8375	General Use	City of Long Beach							Monterey Co.
454	771.834375					General Use	City of Long Beach							Monterey Co.
455	771.840625		771.84375			General Use	City of Long Beach							

Channel Numbers in Green are U.S. Primary, in Pink are Mexico Primary

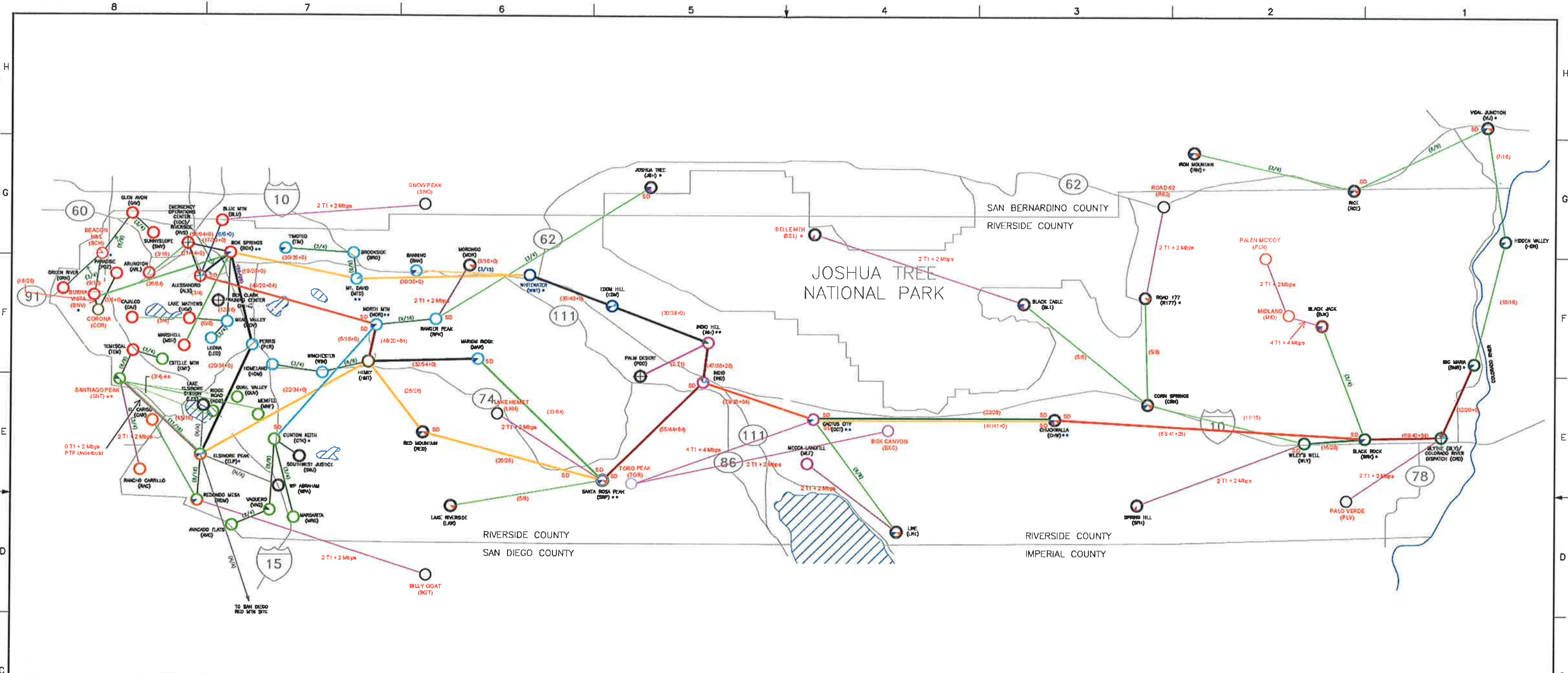
CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
456					General Use	City of Long Beach								
457					General Use			Los Angeles City						
458					General Use			Los Angeles City					Mojave Co.	
459					General Use			Los Angeles City					Mojave Co.	
460					General Use			Los Angeles City					Mojave Co.	
461					General Use	Riverside County			ROAD 177	VIDAL JUNCTION				
462					General Use	Riverside County			ROAD 177	VIDAL JUNCTION				
463					General Use	Riverside County			RED MTN.					Monterey Co.
464					General Use	Riverside County			RED MTN.					Monterey Co.
465					General Use			Orange County					Yuma Co.	Tulare Co.
466					General Use			Orange County					Yuma Co.	Tulare Co.
467					General Use			Orange County					Yuma Co.	Tulare Co.
468					General Use			Orange County					Yuma Co.	Tulare Co.
469					General Use			Riverside County		IRON MTN.				
470					General Use			Riverside County		IRON MTN.				
471					General Use			Riverside County	CORN SPRINGS	SANTIAGO PK				
472					General Use			Riverside County	CORN SPRINGS	SANTIAGO PK				
473					General Use									
474					General Use	State of CA/EMS Authority								
475					General Use	State of CA/EMS Authority								
476					General Use	State of CA/EMS Authority								
477					General Use	State of CA/EMS Authority								
478					General Use	Los Angeles County								
479					General Use	Los Angeles County								
480					General Use	Los Angeles County								
481					General Use			San Bernardino County						Kings Co.
482					General Use			San Bernardino County						Kings Co.
483					General Use			San Bernardino County						Kings Co.
484					General Use			San Bernardino County						Kings Co.
485					General Use			Orange County						Tulare Co.
486					General Use			Orange County						Tulare Co.
487					General Use			Orange County						Tulare Co.
488					General Use			Orange County						Tulare Co.
489					General Use			Riverside County						Tulare Co.
490					General Use			Riverside County	NORTHWEST CELL					Tulare Co.
491					General Use			Riverside County	NORTHWEST CELL					Tulare Co.
492					General Use			Riverside County	RICE	LINE				
493					General Use			Riverside County	RICE	LINE				
494					General Use	City of Long Beach								
495					General Use	City of Long Beach								
496					General Use	City of Long Beach								
497					General Use	City of Long Beach								
498					General Use			Los Angeles City						
499					General Use			Los Angeles City						
500					General Use			Los Angeles City						
501					General Use			Los Angeles City						
502					General Use				SAN JACINTO CELL					
503					General Use				SAN JACINTO CELL					
504					General Use				IRON MTN.					
505					General Use				IRON MTN.					
506					General Use	Santa Barbara County		Orange County						
507					General Use	Santa Barbara County		Orange County						
508					General Use	Santa Barbara County		Orange County						
509					General Use	Santa Barbara County		Orange County						
510					General Use			Riverside County	ROAD 177	VIDAL JUNCTION				Kings Co.
511					General Use			Riverside County	ROAD 177	VIDAL JUNCTION				Kings Co.
512					General Use			Riverside County	NORTHWEST CELL					
513					General Use			Riverside County	NORTHWEST CELL					
514					General Use	State of CA/EMS Authority								
515					General Use	State of CA/EMS Authority								
516					General Use	State of CA/EMS Authority								
517					General Use	State of CA/EMS Authority								
518					General Use	Los Angeles County								
519					General Use	Los Angeles County								
520					General Use	Los Angeles County								
521					General Use			San Bernardino County						Tulare Co.
522					General Use			San Bernardino County						Tulare Co.
523					General Use			San Bernardino County						Tulare Co.
524					General Use			San Bernardino County						Tulare Co.
525					General Use			Orange County						
526					General Use			Orange County						
527					General Use			Orange County						
528					General Use			Orange County						
529					General Use			Orange County						
530					General Use			Riverside County	CORN SPRINGS					Inyo Co.; Kings Co.
531					General Use			Riverside County	CORN SPRINGS					Inyo Co.; Kings Co.
532					General Use			Riverside County	RICE	SNOW PEAK				Inyo Co.; Kings Co.
533					General Use			Riverside County	RICE	SNOW PEAK				Inyo Co.; Kings Co.
534					General Use	City of Long Beach								Mojave Co.
535					General Use	City of Long Beach								Mojave Co.
536					General Use	City of Long Beach								Mojave Co.
537					General Use	City of Long Beach								Mojave Co.
538					General Use			Los Angeles City						
539					General Use			Los Angeles City						
540					General Use			Los Angeles City						
541					General Use			Los Angeles City						
542					General Use			LA County MTA						Yuma Co.
543					General Use			LA County MTA						Yuma Co.
544					General Use			LA County MTA						Yuma Co.
545					General Use	Santa Barbara County		Orange County						Yuma Co.
546					General Use	Santa Barbara County		Orange County						Yuma Co.

Channel Numbers in Green are U.S. Primary, in Pink are Mexico Primary

CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
547	772.415625		772.41875		General Use	Santa Barbara County		Orange County						Monterey Co.
548	772.421875				General Use	Santa Barbara County		Orange County						Monterey Co.
549	772.428125	100	772.43125	101	772.4375	General Use		Riverside County - West	NORTHWEST CELL	IRON MTN.			La Paz Co.	Tulare Co.
550	772.434375				General Use			Riverside County - West	NORTHWEST CELL	IRON MTN.			La Paz Co.	Tulare Co.
551	772.440625	102	772.44375		General Use			Riverside County - West	PALM SPRINGS CELL	VIDAL JUNCTION			La Paz Co.	Tulare Co.
552	772.446875				General Use			Riverside County - West	PALM SPRINGS CELL	VIDAL JUNCTION			La Paz Co.	Tulare Co.
553	772.453125		772.45625		772.4625	General Use	State of CA/EMS Authority							
554	772.459375				General Use	State of CA/EMS Authority								
555	772.465625		772.46875		General Use	State of CA/EMS Authority								
556	772.471875				General Use	State of CA/EMS Authority								
557	772.478125		772.48125		772.4875	General Use	Los Angeles County							
558	772.484375				General Use	Los Angeles County								
559	772.490625		772.49375		General Use	Los Angeles County								
560	772.496875				General Use	Los Angeles County								
561	772.503125		772.50625		772.5125	General Use	UCLA/UC		City of Pomona					Tulare Co.
562	772.509375				General Use	UCLA/UC		City of Pomona						Tulare Co.
563	772.515625		772.51875		General Use	UCLA/UC		City of Pomona						Tulare Co.
564	772.521875				General Use	UCLA/UC		City of Pomona						Tulare Co.
565	772.528125		772.53125		772.5375	General Use		Orange County						
566	772.534375				General Use			Orange County						
567	772.540625		772.54375		General Use			Orange County						
568	772.546875				General Use			Orange County						
569	772.553125	103	772.55625	104	772.5625	General Use		Riverside County	CORN SPRINGS	MORONGO	LAKE HEMET			Inyo Co.
570	772.559375				General Use			Riverside County	CORN SPRINGS	MORONGO	LAKE HEMET			Inyo Co.
571	772.565625	105	772.56875		General Use			Riverside County	NORTHWEST CELL	ROAD 177				Inyo Co.
572	772.571875				General Use			Riverside County	NORTHWEST CELL	ROAD 177				Inyo Co.
573	772.578125		772.58125		772.5875	General Use	City of Long Beach	San Bernardino County						Kings Co.
574	772.584375				General Use	City of Long Beach	San Bernardino County							Kings Co.
575	772.590625		772.59375		General Use	City of Long Beach	San Bernardino County							Kings Co.
576	772.596875				General Use	City of Long Beach	San Bernardino County							Kings Co.
577	772.603125	106	772.60625	107	772.6125	General Use	Riverside County	San Luis Obispo County	NORTHWEST CELL					Mojave Co.
578	772.609375				General Use	Riverside County		San Luis Obispo County	NORTHWEST CELL					Mojave Co.
579	772.615625	108	772.61875		General Use	Riverside County		San Luis Obispo County	PALM SPRINGS CELL	ROAD 177	VIDAL JUNCTION			Mojave Co.
580	772.621875				General Use	Riverside County		San Luis Obispo County	PALM SPRINGS CELL	ROAD 177	VIDAL JUNCTION			Mojave Co.
581	772.628125		772.63125		772.6375	General Use		LA County MTA						
582	772.634375				General Use			LA County MTA						
583	772.640625		772.64375		General Use			LA County MTA						
584	772.646875				General Use			LA County MTA						
585	772.653125		772.65625		772.6625	General Use	Santa Barbara County		Orange County					
586	772.659375				General Use	Santa Barbara County		Orange County						
587	772.665625		772.66875		General Use	Santa Barbara County		Orange County						
588	772.671875				General Use	Santa Barbara County		Orange County						
589	772.678125	109	772.68125	110	772.6875	General Use		Kern County	Riverside County	SAN JACINTO CELL				Yuma Co.
590	772.684375				General Use			Kern County	Riverside County	SAN JACINTO CELL				Yuma Co.
591	772.690625	111	772.69375		General Use			Kern County	Riverside County	ROAD 62				Yuma Co.
592	772.696875				General Use			Kern County	Riverside County	ROAD 62				Yuma Co.
593	772.703125		772.70625		772.7125	General Use	State of CA/EMS Authority							
594	772.709375				General Use	State of CA/EMS Authority								
595	772.715625		772.71875		General Use	State of CA/EMS Authority								Monterey Co.
596	772.721875				General Use	State of CA/EMS Authority								Monterey Co.
597	772.728125		772.73125		772.7375	General Use	Los Angeles County							
598	772.734375				General Use	Los Angeles County								
599	772.740625		772.74375		General Use	Los Angeles County								
600	772.746875				General Use	Los Angeles County								
601	772.753125		772.75625		772.7625	General Use	UCLA/UC		City of Pomona					Tulare Co.
602	772.759375				General Use	UCLA/UC		City of Pomona						Tulare Co.
603	772.765625		772.76875		General Use	UCLA/UC		City of Pomona						Tulare Co.
604	772.771875				General Use	UCLA/UC		City of Pomona						Tulare Co.
605	772.778125		772.78125		772.7875	General Use		Orange County						
606	772.784375				General Use			Orange County						
607	772.790625		772.79375		General Use			Orange County						
608	772.796875				General Use			Orange County						
609	772.803125	112	772.80625	113	772.8125	General Use		Riverside County	CORN SPRINGS	RED MTN. HPD				
610	772.809375				General Use			Riverside County	CORN SPRINGS	RED MTN. HPD				
611	772.815625	114	772.81875		General Use			Riverside County	IRON MTN.	RED MTN. HPD				
612	772.821875				General Use			Riverside County	IRON MTN.	RED MTN. HPD				
613	772.828125		772.83125		772.8375	General Use	City of Long Beach	San Bernardino County - South					La Paz Co.	Inyo Co.; Kings Co.
614	772.834375				General Use	City of Long Beach	San Bernardino County - South						La Paz Co.	Inyo Co.; Kings Co.
615	772.840625		772.84375		General Use	City of Long Beach	San Bernardino County - South						La Paz Co.	Inyo Co.; Kings Co.
616	772.846875				General Use	City of Long Beach	San Bernardino County - South						La Paz Co.	Inyo Co.; Kings Co.
617	772.853125	115	772.85625	116	772.8625	General Use	Riverside County		Kern County	SAN JACINTO CELL				
618	772.859375				General Use	Riverside County		Kern County	SAN JACINTO CELL					
619	772.865625	117	772.86875		General Use	Riverside County		Kern County	ROAD 62					
620	772.871875				General Use	Riverside County		Kern County	ROAD 62					
621	772.878125		772.88125		772.8875	General Use		LA County MTA						Mojave Co.
622	772.884375				General Use			LA County MTA						Mojave Co.
623	772.890625		772.89375		General Use			LA County MTA						Mojave Co.
624	772.896875				General Use			LA County MTA						Mojave Co.
625	772.903125		772.90625		772.9125	General Use	Santa Barbara County		Orange County					
626	772.909375				General Use	Santa Barbara County		Orange County						
627	772.915625		772.91875		General Use	Santa Barbara County		Orange County						
628	772.921875				General Use	Santa Barbara County		Orange County						
629	772.928125	118	772.93125	119	772.9375	General Use		Riverside County	ROAD 177	VIDAL JUNCTION	EDOM HILL HPD			Yuma Co.
630	772.934375				General Use			Riverside County	ROAD 177	VIDAL JUNCTION	EDOM HILL HPD			Yuma Co.
631	772.940625	120	772.94375		General Use			Riverside County	NORTHWEST CELL		EDOM HILL HPD			Yuma Co.
632	772.946875				General Use			Riverside County	NORTHWEST CELL		EDOM HILL HPD			Yuma Co.
633	772.953125		772.95625		772.9625	General Use	State of CA/EMS Authority							
634	772.959375				General Use	State of CA/EMS Authority								
635	772.965625		772.96875		General Use	State of CA/EMS Authority								
636	772.971875				General Use	State of CA/EMS Authority								
637	772.978125		772.98125		772.9875	General Use	Los Angeles County							

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CHANNEL NUMBER	BASE FREQUENCY (MHz)				ALLOCATION	USER	USER	USER	PSEC SITE	PSEC SITE	PSEC SITE	PSEC SITE	REGION 3 USER	REGION 6 USER
	6.25 kHz	PSEC CH. NUMBER	12.5 kHz	PSEC CH. NUMBER										
820	774.121875				Secondary Trunking									
821	774.126125		774.13125		General Use		LA County MTA						Yuma Co.	
822	774.134375				General Use		LA County MTA						Yuma Co.	
823	774.140625		774.14375		General Use		LA County MTA						Yuma Co.	
824	774.146875				General Use		LA County MTA						Yuma Co.	
825	774.153125		774.15625		General Use		Orange County							Tulare Co.
826	774.159375				General Use		Orange County							Tulare Co.
827	774.165625		774.16875		General Use		Orange County							Tulare Co.
828	774.171875				General Use		Orange County							Tulare Co.
829	774.178125		774.18125		General Use	Los Angeles County								Tulare Co.
830	774.184375				General Use	Los Angeles County								Tulare Co.
831	774.190625		774.19375		General Use	Los Angeles County								Monterey Co.
832	774.196875				General Use	Los Angeles County								Monterey Co.
833	774.203125	133	774.20625	134	General Use	City of Ventura	Riverside County	Kern County	VIDAL JUNCTION HPD	NORTH MTN. HPD				
834	774.209375				General Use	City of Ventura	Riverside County	Kern County	VIDAL JUNCTION HPD	NORTH MTN. HPD				
835	774.215625	135	774.21875		General Use	City of Ventura	Riverside County	Kern County	VIDAL JUNCTION HPD	NORTH MTN. HPD				
836	774.221875				General Use	City of Ventura	Riverside County	Kern County	VIDAL JUNCTION HPD	NORTH MTN. HPD				
837	774.228125		774.23125		General Use			Los Angeles City					Mojave Co.	Kings Co.
838	774.234375				General Use			Los Angeles City					Mojave Co.	Kings Co.
839	774.240625		774.24375		General Use			Los Angeles City					Mojave Co.	
840	774.246875				General Use			Los Angeles City					Mojave Co.	
841	774.253125		774.25625		Interoperability									
842	774.259375				Interoperability									
843	774.265625		774.26875		Reserve									
844	774.271875				Reserve									
845	774.278125		774.28125		State license									
846	774.284375				State license									
847	774.290625		774.29375		State license									
848	774.296875				State license									
849	774.303125		774.30625		State license									
850	774.309375				State license									
851	774.315625		774.31875		State license									
852	774.321875				State license									
853	774.328125		774.33125		State license									
854	774.334375				State license									
855	774.340625		774.34375		State license									
856	774.346875				State license									
857	774.353125		774.35625		Interoperability									
858	774.359375				Interoperability									
859	774.365625		774.36875		Reserve									
860	774.371875				Reserve									
861	774.378125		774.38125		General Use		LA County MTA						Yuma Co.	
862	774.384375				General Use		LA County MTA						Yuma Co.	
863	774.390625		774.39375		General Use		LA County MTA						Yuma Co.	Monterey Co.
864	774.396875				General Use		LA County MTA						Yuma Co.	Monterey Co.
865	774.403125		774.40625		General Use		Orange County							Tulare Co.
866	774.409375				General Use		Orange County							Tulare Co.
867	774.415625		774.41875		General Use		Orange County							
868	774.421875				General Use		Orange County							
869	774.428125		774.43125		General Use	Los Angeles County								
870	774.434375				General Use	Los Angeles County								
871	774.440625		774.44375		General Use	Los Angeles County								
872	774.446875				General Use	Los Angeles County								
873	774.453125	136	774.45625	137	General Use	City of Ventura	Riverside County		BOX SPRINGS HPD	IRON MTN. HPD				
874	774.459375				General Use	City of Ventura	Riverside County		BOX SPRINGS HPD	IRON MTN. HPD				
875	774.465625	138	774.46875		General Use	City of Ventura	Riverside County		BOX SPRINGS HPD	IRON MTN. HPD	PALM SPRINGS CELL			Monterey Co.
876	774.471875				General Use	City of Ventura	Riverside County		BOX SPRINGS HPD	IRON MTN. HPD	PALM SPRINGS CELL			Monterey Co.
877	774.478125		774.48125		General Use			Los Angeles City						
878	774.484375				General Use			Los Angeles City						
879	774.490625		774.49375		General Use			Los Angeles City						
880	774.496875				General Use			Los Angeles City						
881	774.503125		774.50625		Interoperability									
882	774.509375				Interoperability									
883	774.515625		774.51875		Reserve									
884	774.521875				Reserve									
885	774.528125		774.53125		State license									
886	774.534375				State license									
887	774.540625		774.54375		State license									
888	774.546875				State license									
889	774.553125		774.55625		State license									
890	774.559375				State license									
891	774.565625		774.56875		State license									
892	774.571875				State license									
893	774.578125		774.58125		State license									
894	774.584375				State license									
895	774.590625		774.59375		State license									
896	774.596875				State license									
897	774.603125		774.60625		Interoperability									
898	774.609375				Interoperability									
899	774.615625		774.61875		Secondary Trunking									
900	774.621875				Secondary Trunking									
901	774.628125		774.63125		General Use	San Diego City	Los Angeles County						Mojave Co.	
902	774.634375				General Use	San Diego City	Los Angeles County						Mojave Co.	
903	774.640625		774.64375		General Use	San Diego City	Los Angeles County						Mojave Co.	
904	774.646875				General Use	San Diego City	Los Angeles County						Mojave Co.	
905	774.653125	139	774.65625	140	General Use	Riverside County		City of Montebello	CHUCKWALLA					
906	774.659375				General Use	Riverside County		City of Montebello	CHUCKWALLA					
907	774.665625	141	774.66875		General Use	Riverside County		City of Montebello	SOUTHWEST CELL					Monterey Co.
908	774.671875				General Use	Riverside County		City of Montebello	SOUTHWEST CELL					Monterey Co.
909	774.678125		774.68125		General Use	Kern County	Orange County	Imperial County						
910	774.684375				General Use	Kern County	Orange County	Imperial County						



SITE LINK LEGEND

LINK COLOR	TYPE / CAPACITY / NOTES	YEAR	COMMENTS
Orange	EXISTING 8 GHz		
Yellow	EXISTING 11 GHz		
Red	EXISTING OVERSHELD 8 GHz		
Red	EXISTING OVERSHELD 11 GHz		
Green	NEW 8 GHz ALICTEL-LUCENT		
Green	NEW 10/11 GHz ALICTEL-LUCENT		
Purple	NEW 3.8 GHz MOTOROLA PTP		
Blue	RELOCATED 8 GHz EXISTING SWF EQUIPMENT MOVED TO NEW SITES		
Blue	RELOCATED 11 GHz EXISTING SWF EQUIPMENT MOVED TO NEW SITES		
Black	EXISTING - NON-PTP LINK		

RADIO SITE LEGEND

Northwest Simulcast - 700 MHz	Emergency	SD - 700 MHz
Southwest Simulcast - 700 MHz	Mantra	Extreme Management
San Jacinto Simulcast - 700 MHz	Pager	Monitoring IRUB Site
Valle Springs Simulcast - 700 MHz	Alerts as needed repeater - 700 MHz	
SDW Simulcast - 700 MHz	Alerts as needed repeater - 700 MHz	
Blayer Simulcast - 700 MHz	Alerts as needed repeater - 700 MHz	
Southwest Simulcast - VHF	Alerts as needed repeater - 700 MHz	
Santa Rosa Simulcast - 700 MHz	Alerts - 700 MHz	
Desert Simulcast - 700 MHz	Existing Site, PTP SWF Only	
Coverage Enhancement ASTRO 25 Trunked Repeater - 700 MHz		
Space Frequency Base		

- NOTES:**
- NEW LINK FORMAT:
ENDPOINT A (T1s REQUIRED/RADIO T1 CAPACITY) ENDPOINT B
 - EXISTING PRE-UPGRADE/OVERSHELD LINK FORMAT:
ENDPOINT A (T1s REQ'D/EXISTING T1s AVAILABLE) ENDPOINT B
 - COR AND HMT SITES ARE MICROWAVE ONLY SITES.
 - POD TO SWF LINK IS TO BE IMPLEMENTED BY THE COUNTY.
 - BOC TO HMT LINK IS PENDING CHANGE MANAGEMENT APPROVAL.
 - ADDITIONAL T1/ETHERNET CAPACITY FOR FUTURE BATTERY PLANT MONITORING IS PENDING CHANGE MANAGEMENT APPROVAL.
 - THE FOLLOWING LINKS ARE NOT PART OF THE PSEC PROJECT:
CTN TO SWF, ELP TO LCL, ELP TO WPA, ELP TO SAN DIEGO RED MTH.

REV NO.	DATE	ENGR.	DESCRIPTION
H			
G			
F			
E			
D			
C			
B	7-27-10	A.R.	ENHANCED COVERAGE UPDATE
A	8-12-08	A.R.	DESIGN REVIEW UPDATE
O	6-27-06	A.R.	ORIGINAL RELEASE

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: MICROWAVE NETWORK MAP

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:
PROGRAM:	DRAWN:	CHECKS:	NONE
FILE NAME:	DATE:	PROJECT NUMBER:	SHEET: 1 OF 1
1_PSEC_SYS_10_04_0_0	10-31-07	CA-041154B	DRAWING NO.:

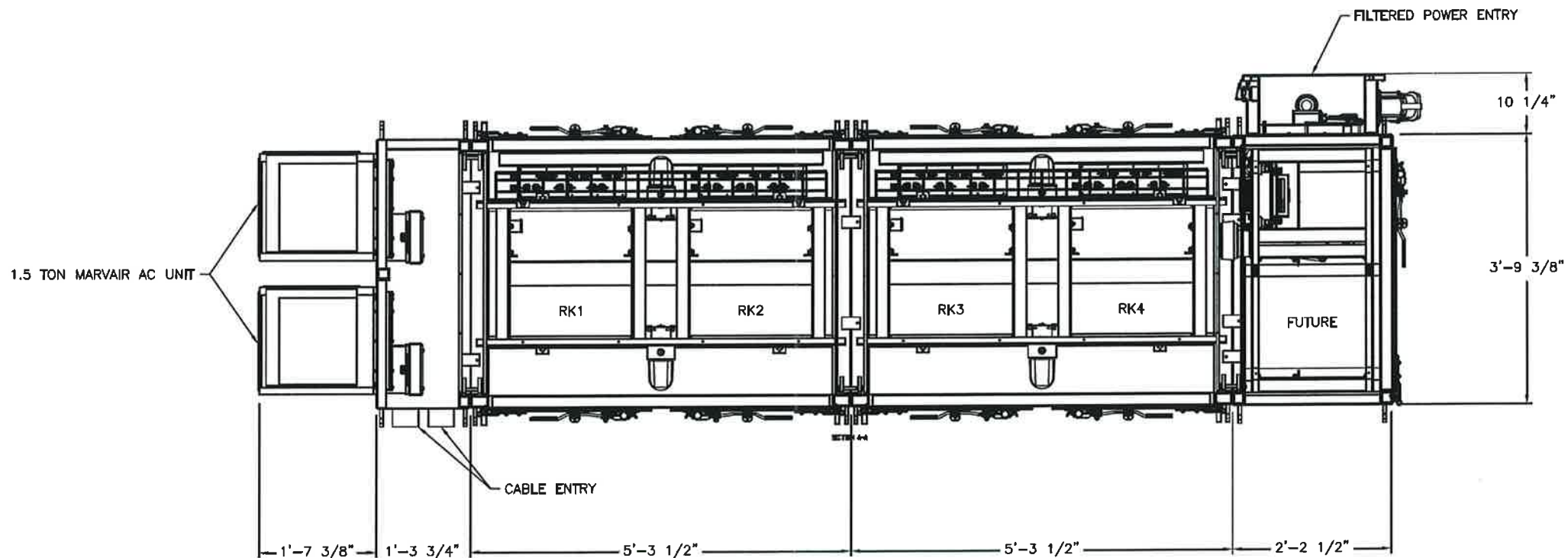
ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

CONTENTS ARE MOTOROLA CONFIDENTIAL PROPRIETARY

INFORMATION ONLY

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_BGT_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

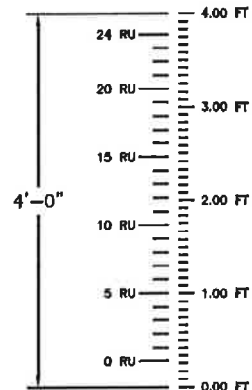
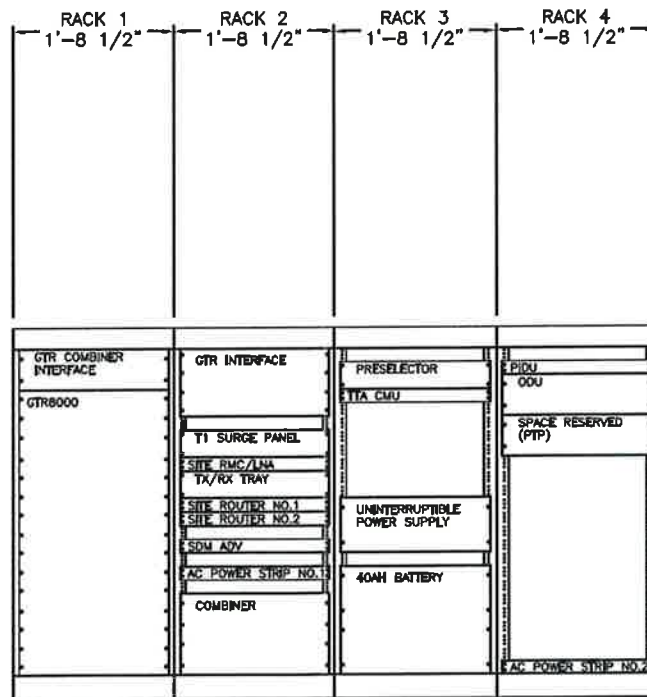
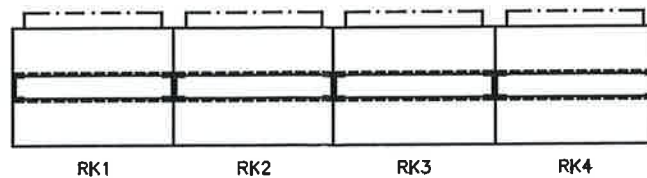
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O	7-27-10	LT.	ORIGINAL RELEASE -- AS BUILT
REV	NO:	DATE	BY/NO:

MOTOROLA NETWORKS AND ENTERPRISES			
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT			
TITLE: BILLY GOAT SITE EQUIPMENT ROOM FLOOR PLAN			
CONTRACT:	DRAWN: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'
PROGRAM: AUTOCAD 2004	CHECKED: V. PARKER	DATE: 7-23-10	SHEET: 1 OF 1
FILE NAME: 1_PSEC_BGT_06_01_0_0	PROJECT NUMBER: CA-04154B	DRAWING NO:	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_BGT_06_01_0_0.



REV NO.	DATE	BY	DESCRIPTION
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MOTOROLA NETWORKS AND ENTERPRISES

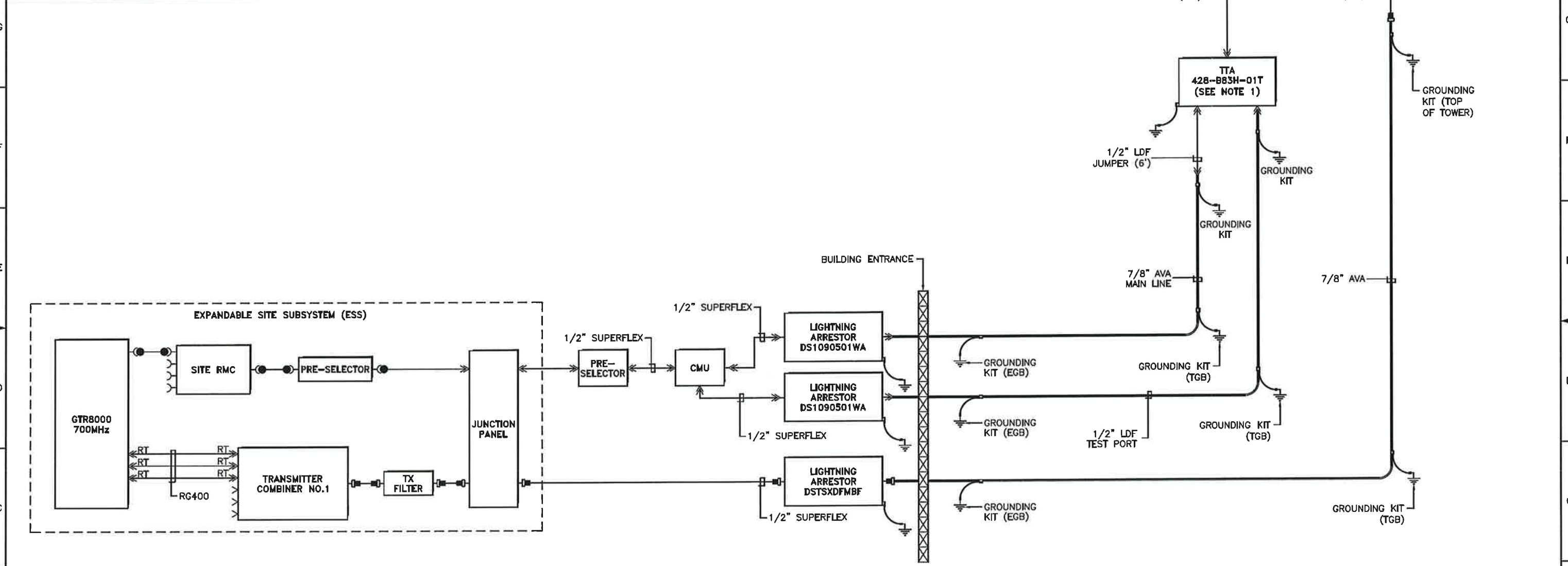
PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: BILLY GOAT SITE
EQUIPMENT RACK FACE LAYOUT

CONTRACT:	DRAWN: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SHEET: D
PROGRAM: AUTOCAD 2004	CHECKED: V. PARKER	DATE: 7-23-10	SHEET: 1 OF 1	REV:
FILE NAME: 1_PSEC_BGT_06_01_0_0	PROJECT NUMBER: CA-04154B	DRAWING NO:		

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

FREQUENCY CHART		
COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	770.06875
2	2	769.56875
3	3	769.31875
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	



- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.

CONNECTOR/SYMBOL LEGEND						
⊥	FEMALE "N" TYPE	⊥	BNC MALE	⊥	DIN FEMALE	
⊥	MALE "N" TYPE	⊥	BNC FEMALE	⊥	DIN MALE	
⊥	QMA MALE	⊥	DEUTSCH FEMALE	⊥	RT	RIGHT ANGLE "N" TYPE
⊥	QMA FEMALE	⊥	DEUTSCH MALE	⊥	⊥	RIGHT ANGLE ADAPTOR
⊥	RJ45 MALE	⊥	DB 15	⊥	⊥	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

REV	DATE	BY	DESCRIPTION
A	8-27-10	L.T.	ORIGINAL RELEASE - AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

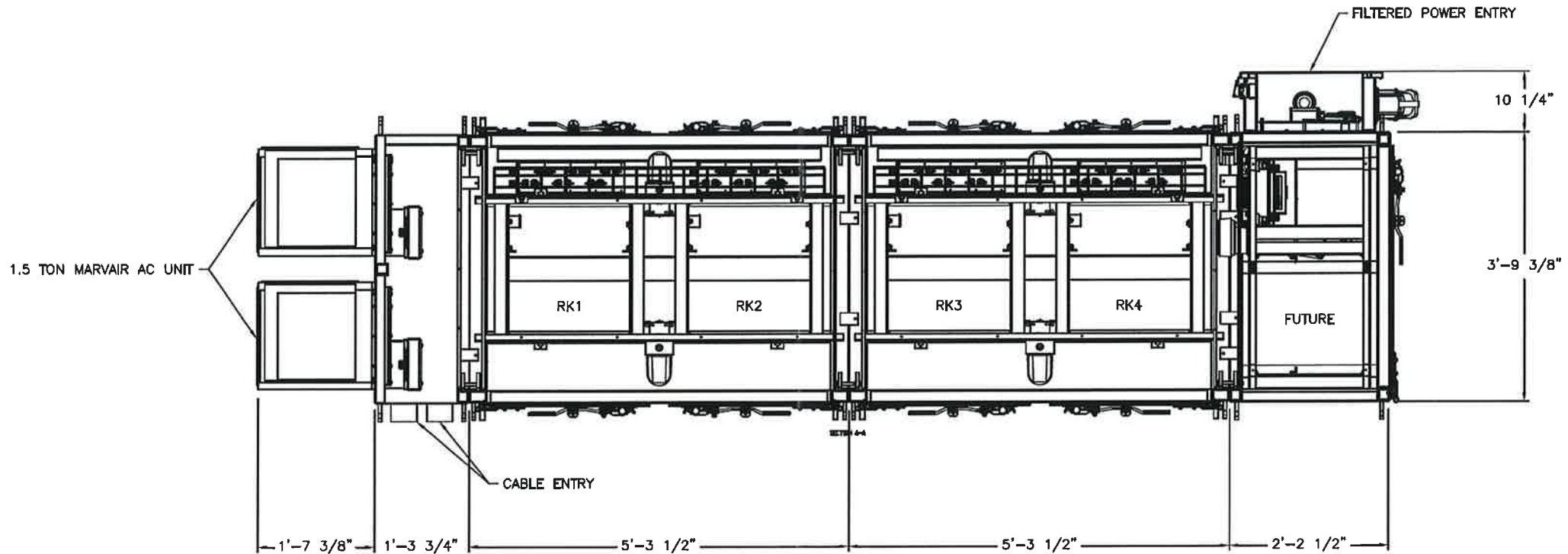
TITLE: BILLY GOAT SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
	L. TRAN	B. WOOLLEY	NONE	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REP:
AUTOCAD 2004	C. MAGNUSSON	L. TRAN	1 OF 1	
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO.:	
1_PSEC_BGT_11_01_0_0	7-29-10	CA-041154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_BXC_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

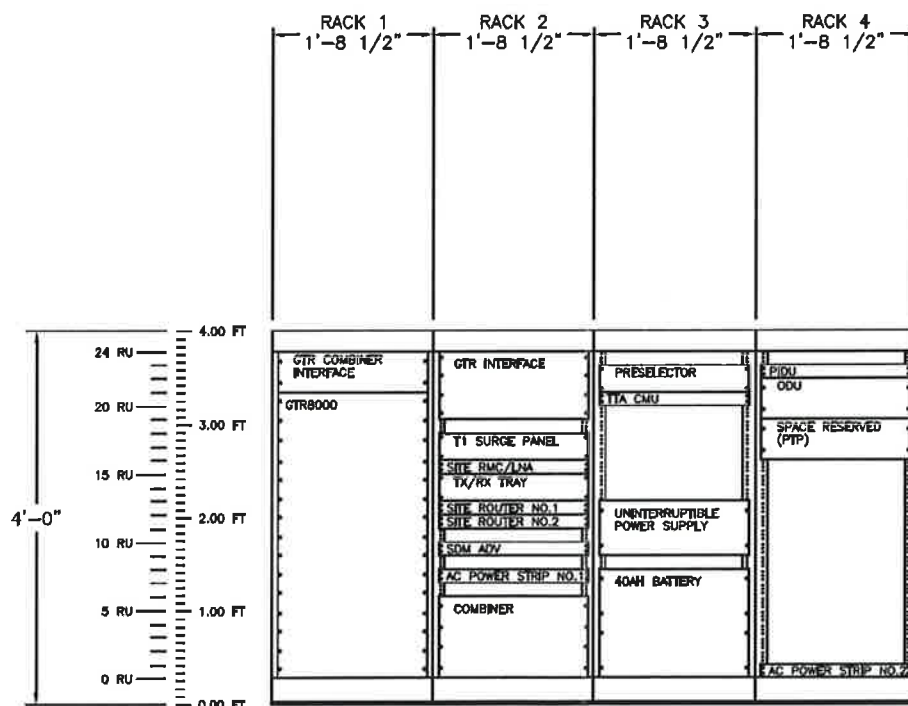
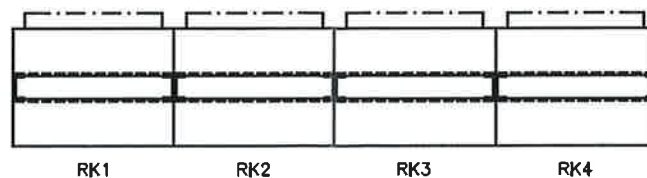
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O	7-27-10	L.T.	ORIGINAL RELEASE -- AS BUILT
REV	DATE	BY	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES				
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT				
TITLE: BOX CANYON SITE EQUIPMENT ROOM FLOOR PLAN				
CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SHEET: D
PROGRAM: AUTOCAD 2004	DRAWN: V. PARKER	CHECKED: L. TRAN	SHEET: 1 OF 1	REV:
FILE NAME: 1_PSEC_BXC_09_01_0_0	DATE: 7-23-10	PROJECT NUMBER: CA-04154B	DRAWING NO:	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_BXC_06_01_0_0.



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O	7-29-10	LT.	ORIGINAL RELEASE -- AS BUILT
REV NO.	DATE	BY/RC	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

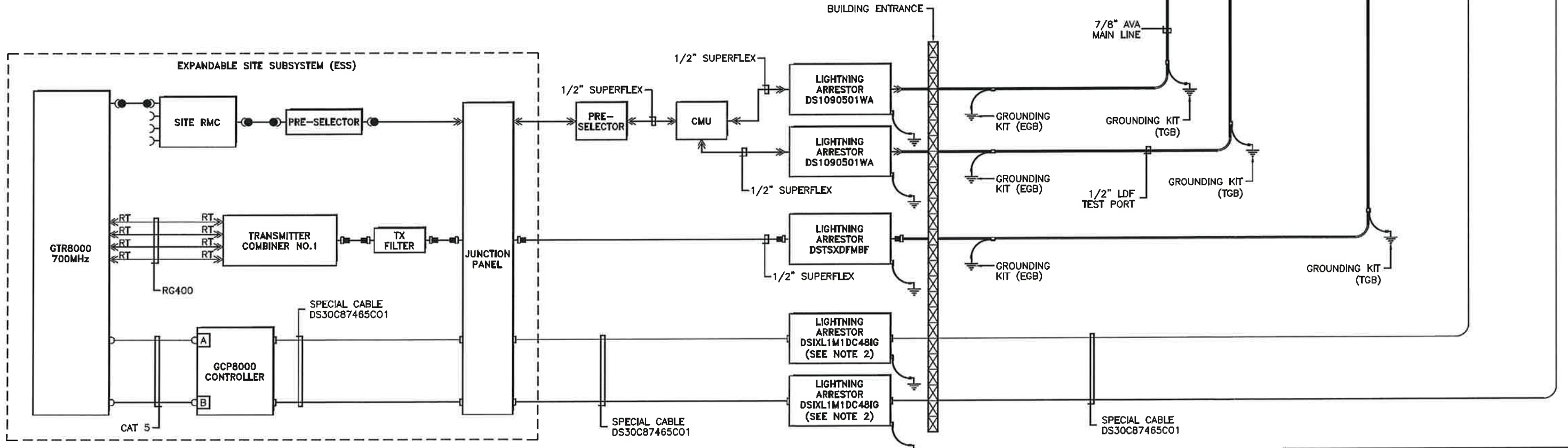
TITLE: BOX CANYON SITE
EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REF:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1	
FILE NAME:	DATE:	PROJECT NUMBER:	CUSTOMER NO.:	
1_PSEC_BXC_06_01_0_0	7-23-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

FREQUENCY CHART COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	770.30625
2	2	770.06875
3	3	769.56875
4	4	769.31875
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	

- NOTES:
- TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 - GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 - ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 - REFER TO TOWER DRAWING FOR ANTENNA DETAILS.



CONNECTOR/SYMBOL LEGEND						
⊥	FEMALE "N" TYPE	□	BNC MALE	⊥	DIN FEMALE	
⊥	MALE "N" TYPE	□	BNC FEMALE	⊥	DIN MALE	
●	QMA MALE	⊥	DEUTSCH FEMALE	⊥	RT	RIGHT ANGLE "N" TYPE
⊥	QMA FEMALE	⊥	DEUTSCH MALE	⊥	RT	RIGHT ANGLE ADAPTOR
⊥	RJ45 MALE	⊥	DB 15	⊥	⊥	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

REV	NO.	DATE	BY	CHKD.	DESCRIPTION
	0	8-27-10	L.T.		ORIGINAL RELEASE -- AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

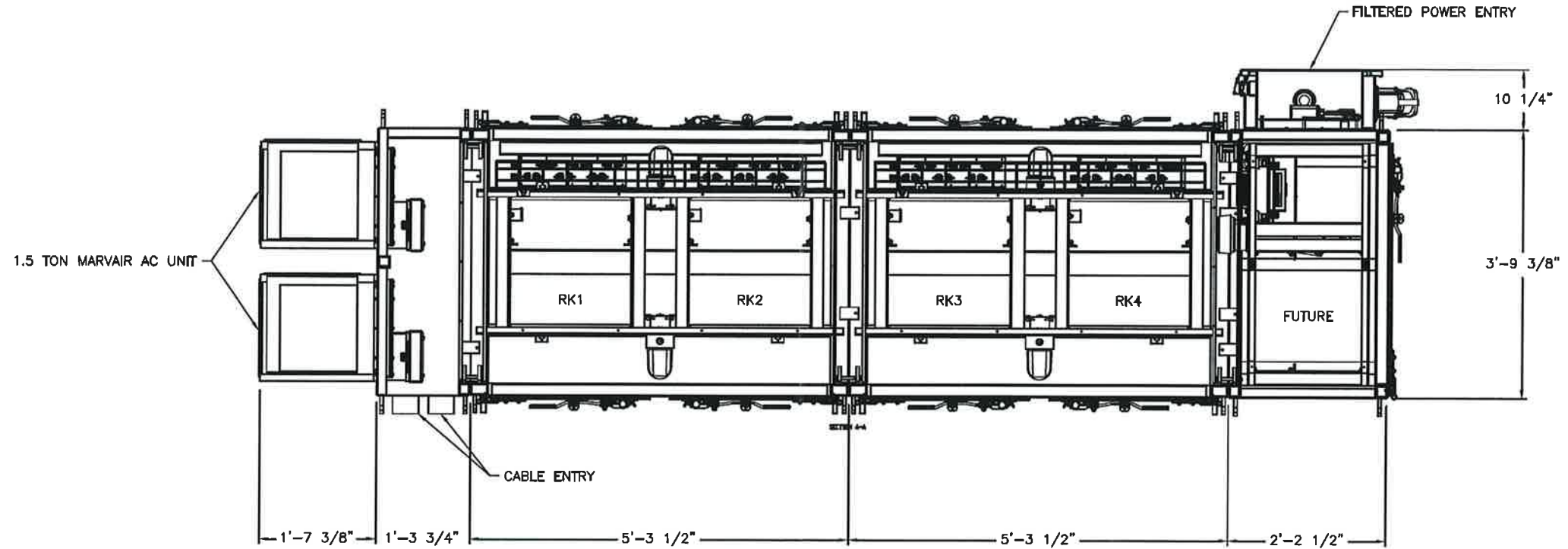
TITLE: BOX CANYON SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	DESIGNED:	PROJECT MANAGER:	SCALE:	SHEET:
PROGRAM:	CHECKED:		NONE	1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:		
1_PSEC_BKC_11_01_0_0	7-26-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_LKH_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

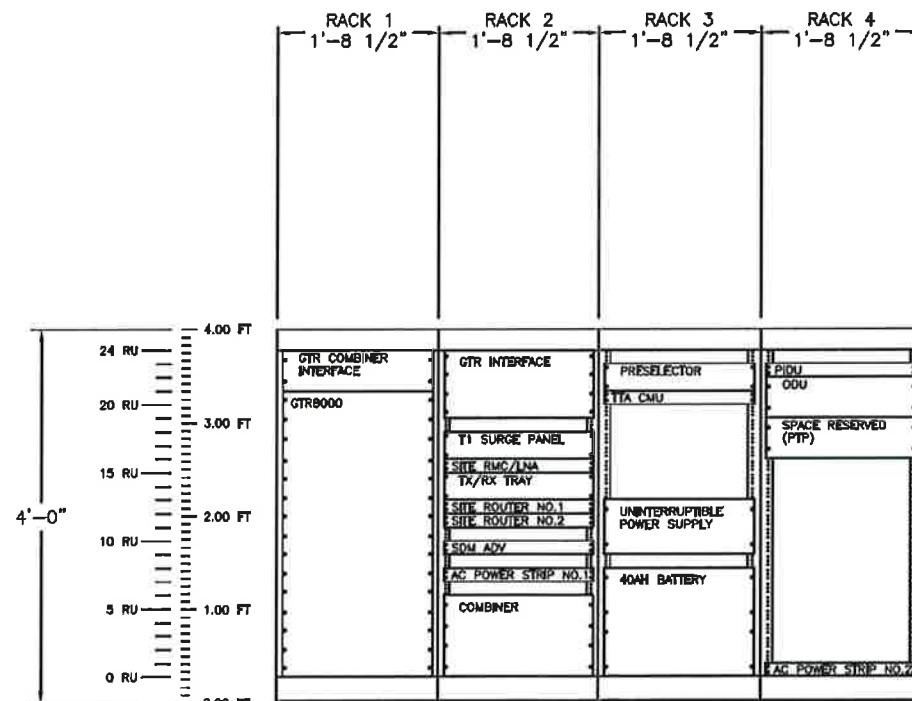
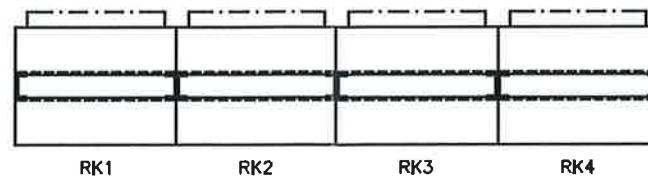
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O	7-27-10	LT.	ORIGINAL RELEASE - AS BUILT
REF NO:	DATE:	BY:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES	
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT	
TITLE: LAKE HEMET SITE EQUIPMENT ROOM FLOOR PLAN	
CONTRACT: L. TRAN	PROJECT MANAGER: B. WOOLLEY
PROGRAM: AUTOCAD 2004	SCALE: 1"=1'
FILE NAME: 1_PSEC_LKH_09_01_0_0	DATE: 7-23-10
DATE: 7-23-10	PROJECT NUMBER: CA-04154B
DATE: 7-23-10	ISSUED FOR: []

ORIGINAL DOCUMENT SIZE IS 22234. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_LKH_06_01_0_0.

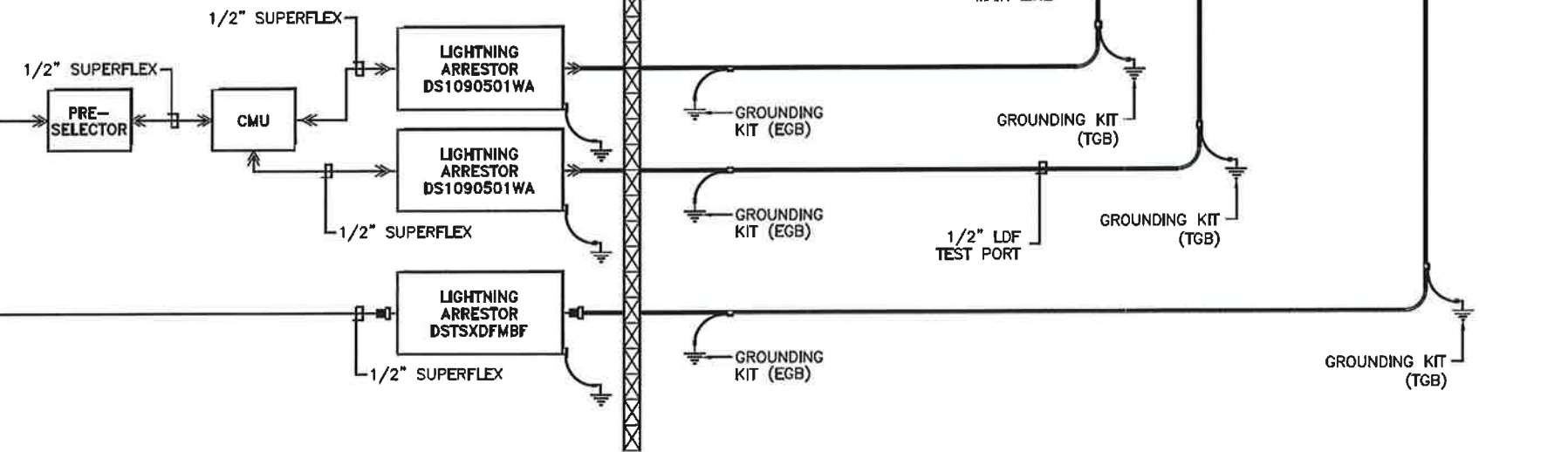
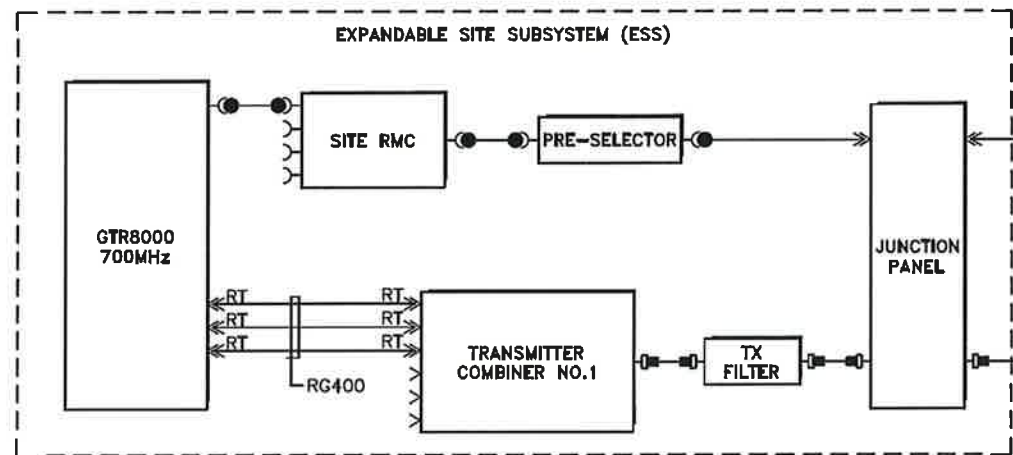


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O	7-29-10	L.T.	ORIGINAL RELEASE - AS BUILT
REV NO.	DATE	ENGR.	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES				
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT				
TITLE: LAKE HEMET SITE EQUIPMENT RACK FACE LAYOUT				
CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
AUTOCAD 2004	L. TRAN	B. WOOLLEY	1"=1'	D
FILE NAME:	DRAWN:	CHECKED:	SHEET:	REV:
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REV NO.	DATE:	PROJECT NUMBER:	DRAWING NO.:	
	7-23-10	CA-041154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

FREQUENCY CHART		
COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	772.55625
2	2	771.30625
3	3	771.05625
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	



- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.

CONNECTOR/SYMBOL LEGEND					
⊥	FEMALE "N" TYPE	□	BNC MALE	⊥	DIN FEMALE
⊥	MALE "N" TYPE	□	BNC FEMALE	⊥	DIN MALE
●	QMA MALE	⊥	DEUTSCH FEMALE	⊥	RT
⊥	QMA FEMALE	⊥	DEUTSCH MALE	⊥	RIGHT ANGLE "N" TYPE
⊥	RJ45 MALE	⊥	DB 15	⊥	RIGHT ANGLE ADAPTOR
		⊥		⊥	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

REV	NO.	DATE	BY/PC	DESCRIPTION
	8-27-10	LT.		ORIGINAL RELEASE - AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

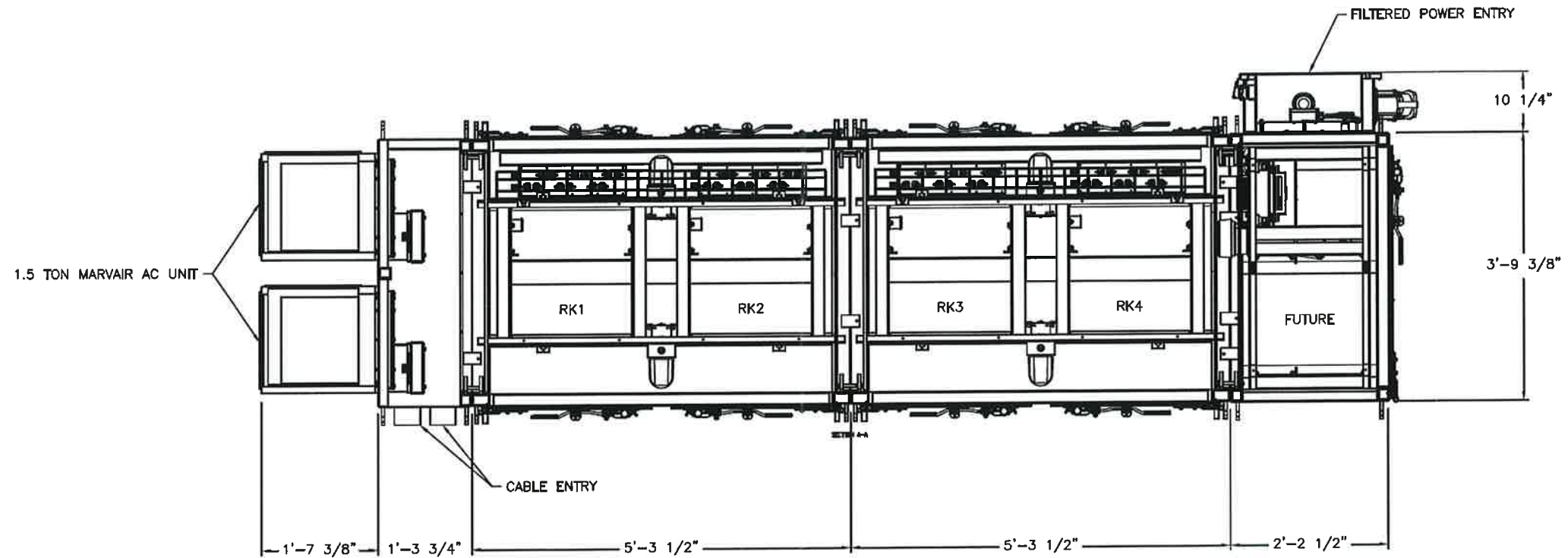
TITLE: LAKE HEMET SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
ALTOCAD 2004	L. TRAN	B. WOOLLEY	NONE	D
FILE NAME:	DRAWN:	CHECKED:	SHEET:	REV:
1_PSEC_LKH_11_01_0_0	C. MAGNUSSON	L. TRAN	1 OF 1	
	DATE:	PROJECT NUMBER:	ISSUED BY:	
	7-29-10	CA-041154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_MID_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TAA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



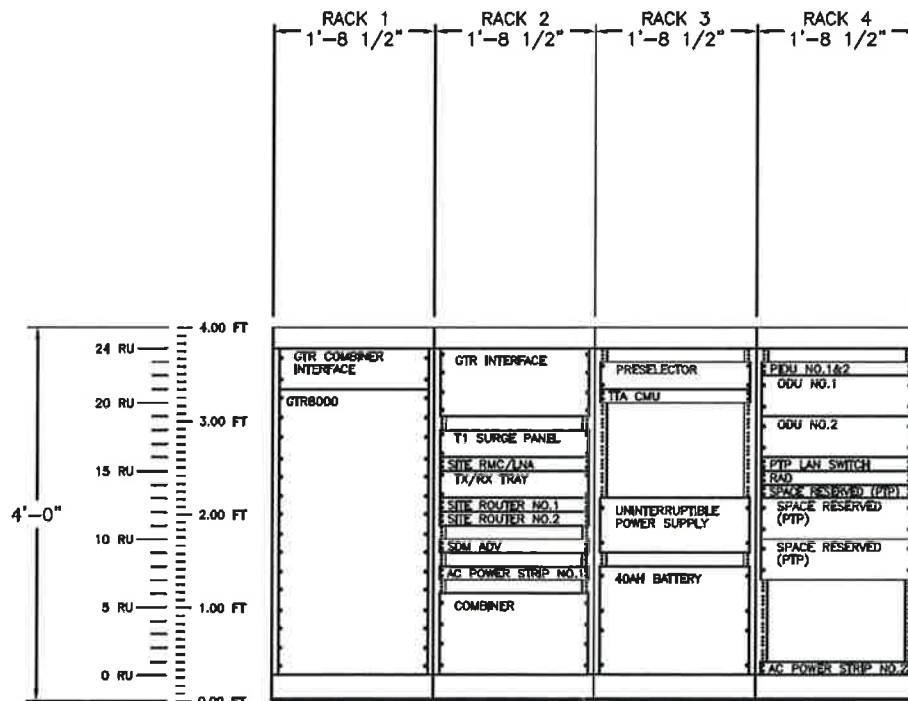
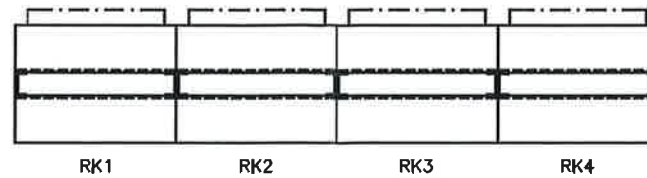
EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

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O	7-27-10	LT.	ORIGINAL RELEASE -- AS BUILT	
REV	NO.	DATE	ENGR	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES			
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT			
TITLE: MIDLAND SITE EQUIPMENT ROOM FLOOR PLAN			
CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:
L. TRAN	B. WOOLLEY	L. TRAN	1"=1'
PROGRAM:	DRAWN:	CHECKED:	SHEET:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO.:
1_PSEC_MID_06_01_0_0	7-23-10	CA-041154B	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:
 1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT,
 SEE DWG. NO. 1_PSEC_MID_06_01_0_0.



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O	7-27-10	LT.	ORIGINAL RELEASE -- AS BUILT
REF NO	DATE	BY	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
 PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

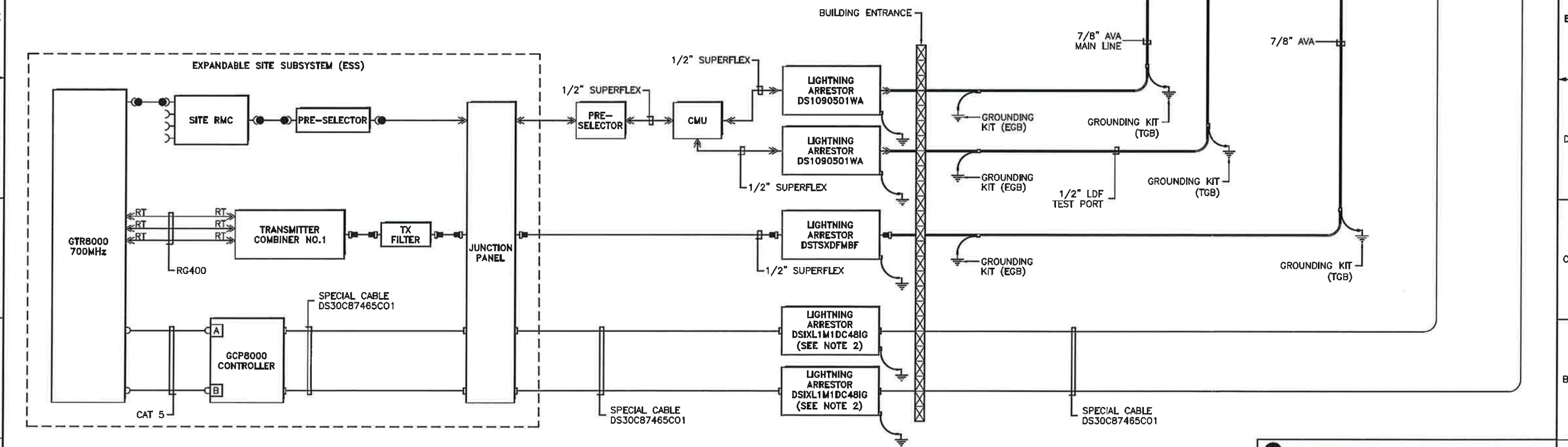
TITLE: MIDLAND SITE
 EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REV:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1	
PLT FILE:	DATE:	PROJECT NUMBER:		
1_PSEC_MID_06_01_0_0	7-23-10	CA-041154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

FREQUENCY CHART		
COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	774.91875
2	2	771.43125
3	3	769.76875
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	

- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.



CONNECTOR/SYMBOL LEGEND					
⊥	FEMALE "N" TYPE	□	BNC MALE	⊥	DIN FEMALE
⊥	MALE "N" TYPE	□	BNC FEMALE	⊥	DIN MALE
●	QMA MALE	⊥	DEUTSCH FEMALE	⊥	RT RIGHT ANGLE "N" TYPE
⊥	QMA FEMALE	⊥	DEUTSCH MALE	⊥	RT RIGHT ANGLE ADAPTOR
⊥	RJ45 MALE	⊥	DB 15	⊥	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

REV	DATE	BY	DESCRIPTION
0	8-27-10	L.T.	ORIGINAL RELEASE -- AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

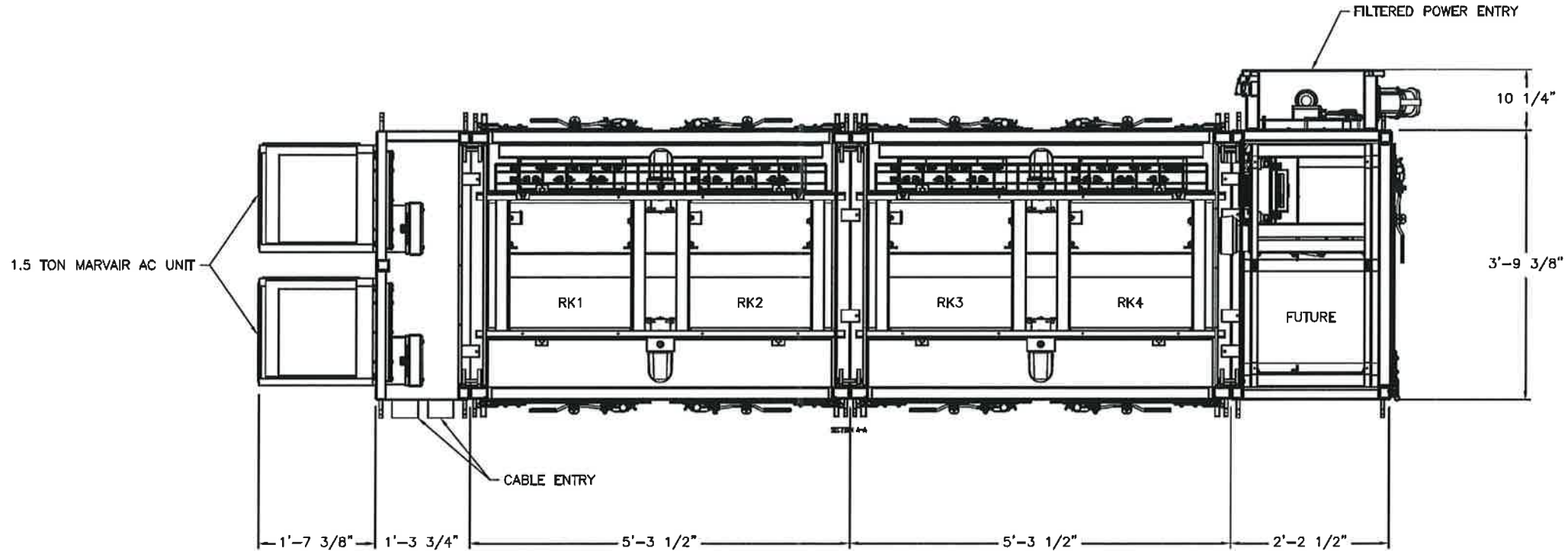
TITLE: MIDLAND SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
	L. TRAN	B. WOOLLEY	NONE	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REV:
AUTOCAD 2004	M. CRUZ	L. TRAN	1 OF 1	
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO.:	
1_PSEC_MID_11_01_0_0	7-29-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_PLN_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



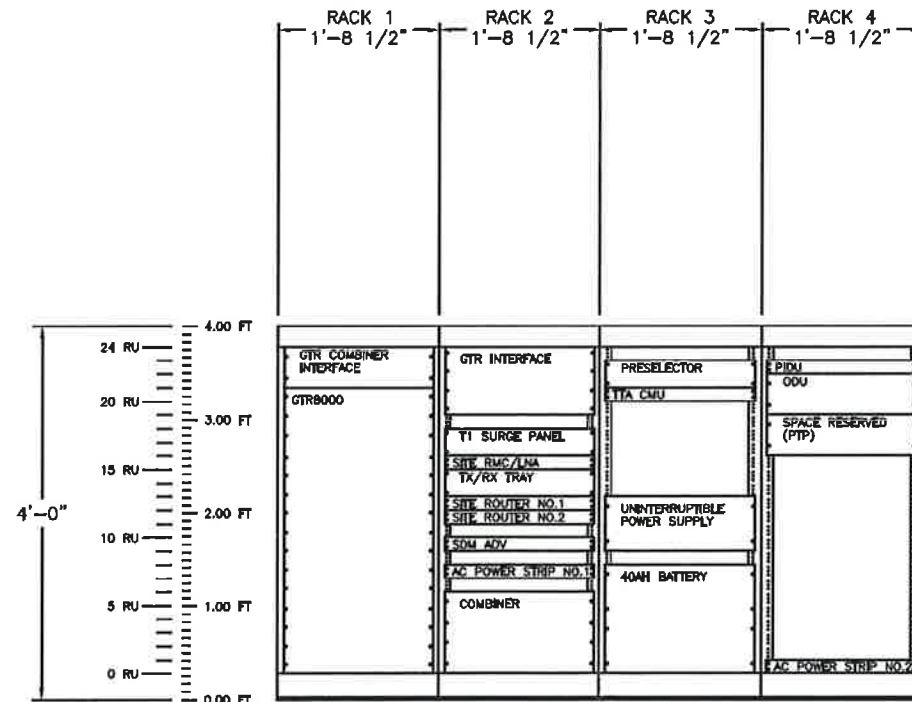
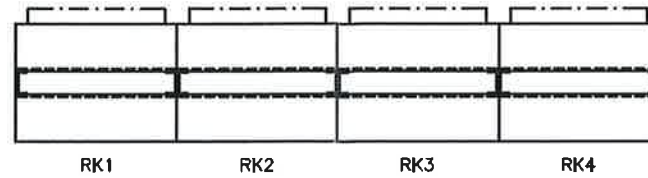
EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

H				MOTOROLA NETWORKS AND ENTERPRISES	
G				PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT	
F				TITLE: PALEN McCOY SITE EQUIPMENT ROOM FLOOR PLAN	
E				CONTRACT: ENGINEER: L. TRAN PROJECT MANAGER: B. WOOLLEY SCALE: 1"=1' SIZE: D	
D				DRAWING: V. PARKER CHECKED: L. TRAN SHEET: 1 OF 1	
C				DATE: 7-23-10 PROJECT NUMBER: CA-041154B DRAWING NO:	
B				PROGRAM: AUTOCAD 2004	
A		7-27-10 L.T. ORIGINAL RELEASE -- AS BUILT		FILE NAME: 1_PSEC_PLN_06_01_0_0	
O		DATE: 7-27-10 ENGR: L.T. DESCRIPTION: ORIGINAL RELEASE -- AS BUILT		DATE: 7-23-10 PROJECT NUMBER: CA-041154B DRAWING NO:	
REF. NO:		DATE:		ENGR:	

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_PLN_06_01_0_0.



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O	7-29-10	L.T.	ORIGINAL RELEASE -- AS BUILT
REP NO:	DATE	ENGR:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: PALEN McCOY SITE
EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
	L. TRAN	B. WOOLLEY	NONE	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REV:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1	
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO:	
1_PSEC_PLN_09_01_0_0	7-23-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

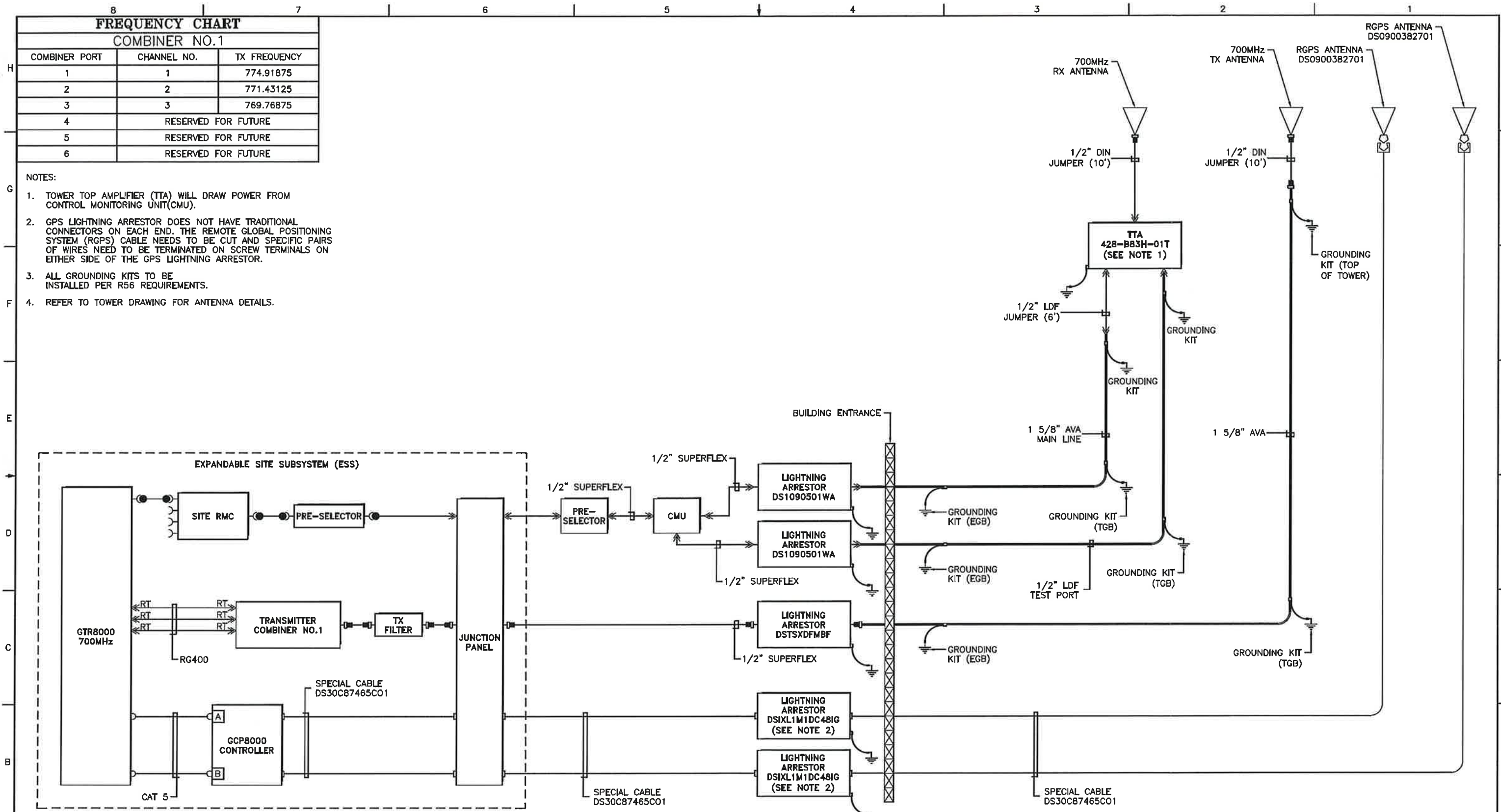
FREQUENCY CHART

COMBINER NO.1

COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	774.91875
2	2	771.43125
3	3	769.76875
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	

NOTES:

1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.



CONNECTOR/SYMBOL LEGEND

◁	FEMALE "N" TYPE	□	BNC MALE	-C	DIN FEMALE
▷	MALE "N" TYPE	◻	BNC FEMALE	—	DIN MALE
●	QMA MALE	⊞	DEUTSCH FEMALE	RT	RIGHT ANGLE "N" TYPE
◡	QMA FEMALE	⊞	DEUTSCH MALE	RT	RIGHT ANGLE ADAPTOR
⊞	RJ45 MALE	⊞	DB 15	⊞	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: PALEN McCOY SITE EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
PROGRAM:	DRAWN:	CHECKED:	DATE:	NO. OF SHEETS:
FILE NAME:	DATE:	PROJECT NUMBER:		

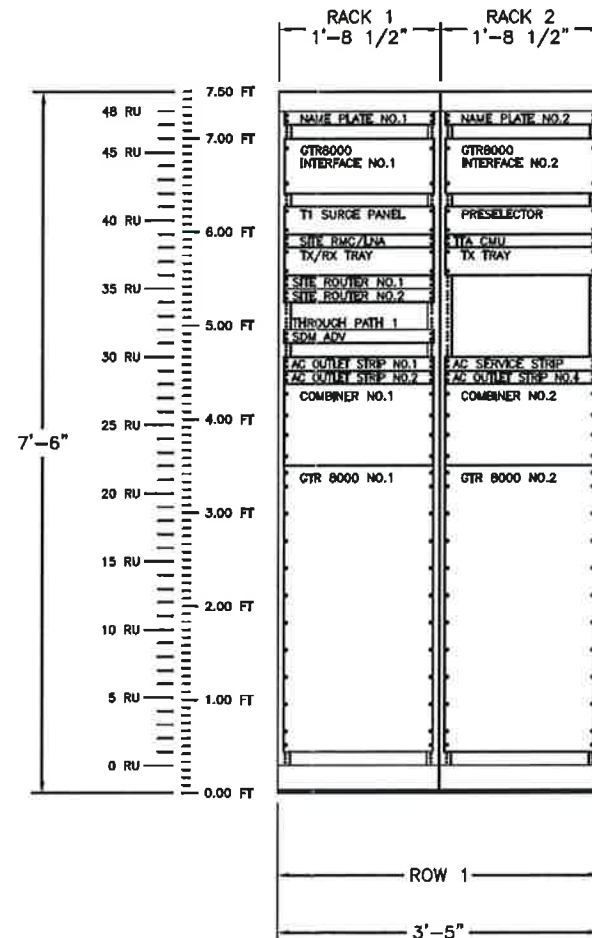
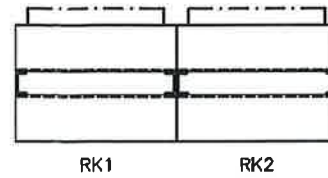
8-27-10 LT. ORIGINAL RELEASE -- AS BUILT

DATE: 7-26-10 PROJECT NUMBER: CA-041154B

ORIGINAL DOCUMENT SIZE IS 22x34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_PDZ_06_01_0_0.
2. FOR EQUIPMENT ROOM CABLE TRAY LAYOUT, SEE DWG. NO. 1_PSEC_PDZ_07_01_0_0.
3. CABLE TRAY IS LOCATED 8'-2" A.F.F.

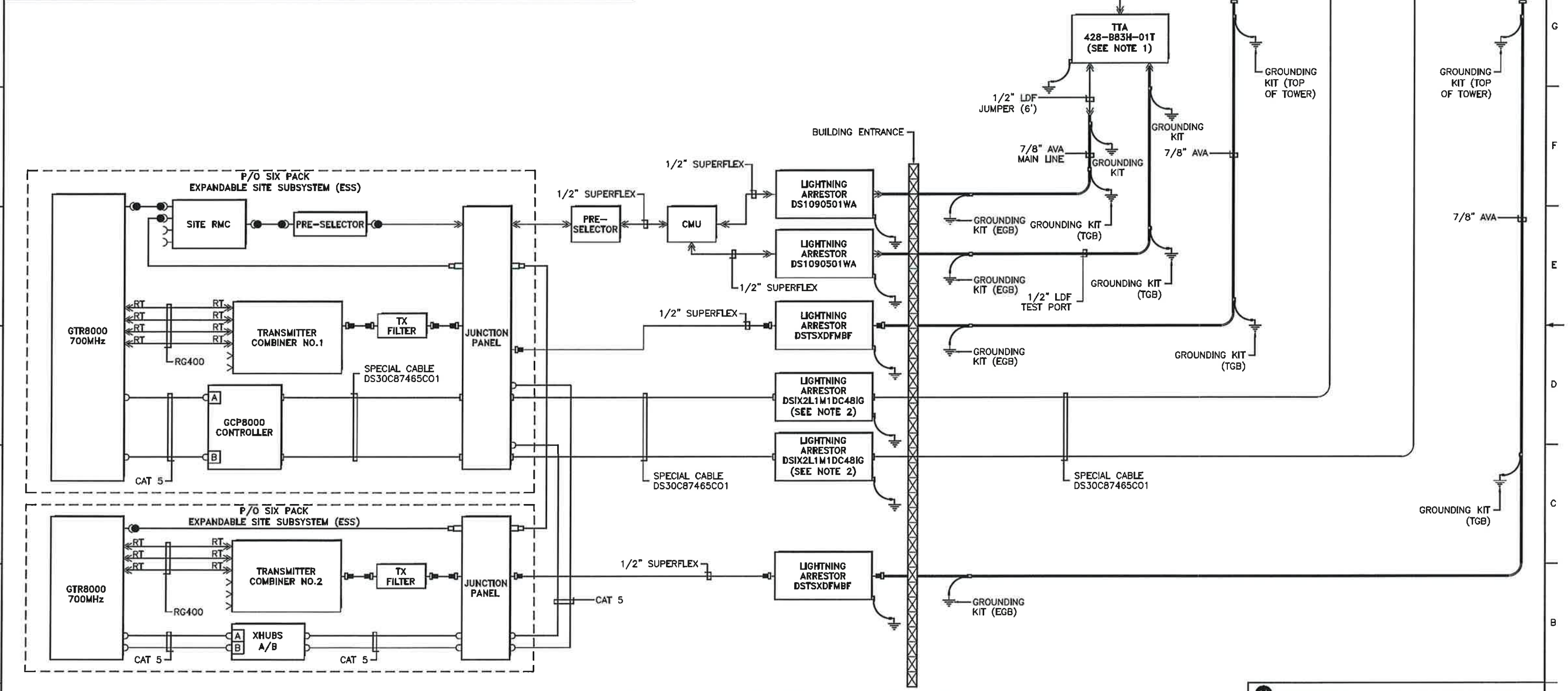


REV NO	DATE	BY	DESCRIPTION
0	7-30-10	L.T.	ORIGINAL RELEASE -- AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES	
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT	
TITLE: PARADISE PEAK SITE EQUIPMENT ROOM RACK FACE LAYOUT	
CONTRACT:	ENGINEER: L. TRAN
PROGRAM: AUTOCAD 2004	PROJECT MANAGER: B. WOOLLEY
FILE NAME: 1_PSEC_PDZ_06_01_0_0	CHECKED: L. TRAN
DATE: 7-29-10	DRAWN: C. MAGNUSSON
	PROJECT NUMBER: CA-04154B
	DRAWING NO:

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

FREQUENCY CHART					
COMBINER NO.1			COMBINER NO.2		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY	COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	773.45625	1	5	772.94375
2	2	772.60625	2	6	772.56875
3	3	772.43125	3	7	772.19375
4	4	772.05625	4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE		5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE		6	RESERVED FOR FUTURE	



- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.

CONNECTOR/SYMBOL LEGEND					
⊥	FEMALE "N" TYPE	□	BNC MALE	⊥	DIN FEMALE
⊥	MALE "N" TYPE	□	BNC FEMALE	⊥	DIN MALE
●	QMA MALE	⊥	DEUTSCH FEMALE	⊥	RT RIGHT ANGLE "N" TYPE
⊥	QMA FEMALE	⊥	DEUTSCH MALE	⊥	RT RIGHT ANGLE ADAPTOR
⊥	RJ45 MALE	⊥	DB 15	⊥	50 OHM LOAD

REV	NO.	DATE	ENGR.	DESCRIPTION
	0	8-27-10	LT.	ORIGINAL RELEASE -- AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: PARADISE PEAK SITE
ANTENNA INTERCONNECT DIAGRAM

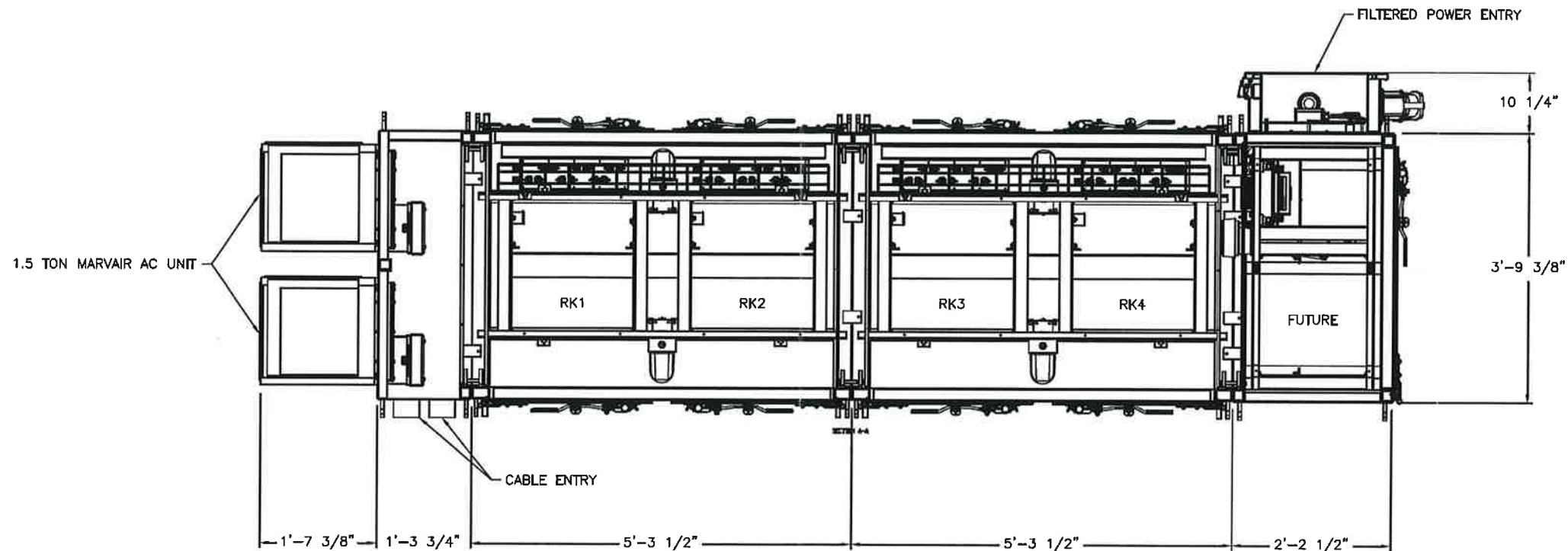
CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
	L. TRAN	LARRY YOUNG	NONE	D
PROGRAM:	DRAWN:	CHECKED:		REV:
AUTOCAD 2004	C. MAGNUSSON	L. TRAN		1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:		DRAWING NO.:
L_PSEC_PDZ_11_01_0_0	7-29-10	CA-04154B		

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_PLV_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

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O	7-27-10	L.T.	ORIGINAL RELEASE - AS BUILT
REF NO:	DATE	ENGR	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

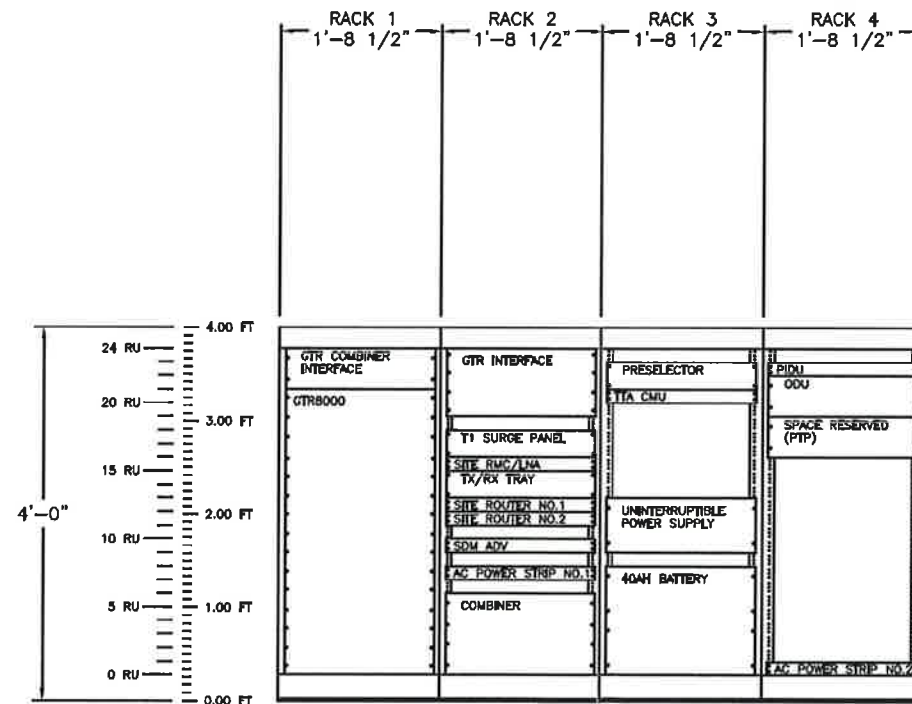
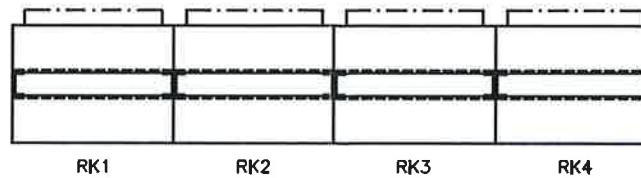
TITLE: PALO VERDE SITE
EQUIPMENT ROOM FLOOR PLAN

CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SIZE: D
PROGRAM: AUTOCAD 2004	DRAWN: V. PARKER	CHECKED: L. TRAN	SHEET: 1 OF 1	REV:
FILE NAME: 1_PSEC_PLV_08_01_0_0	DATE: 7-23-10	PROJECT NUMBER: CA-04154B	DRAWING NO:	

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_PLV_06_01_0_0.



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O	7-29-10	L.T.	ORIGINAL RELEASE -- AS BUILT
NO:	DATE:	ENGR:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES

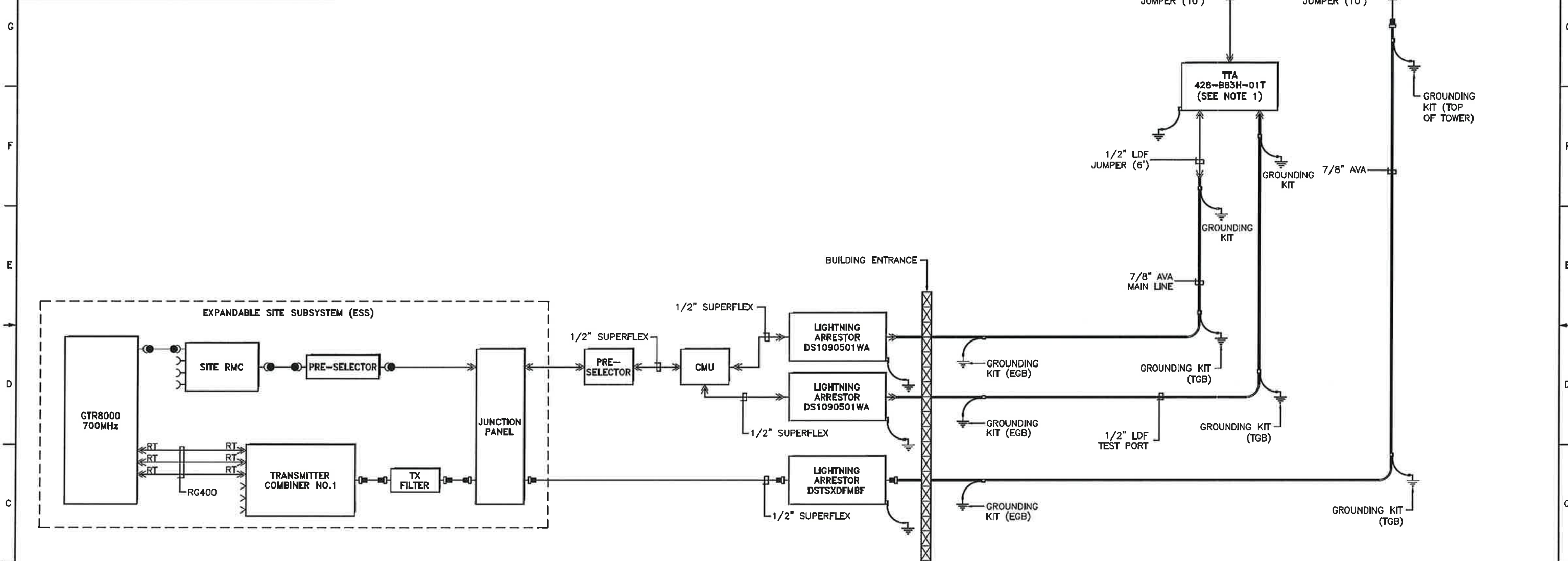
PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: PALO VERDE SITE
EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SIZE:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REV:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1	
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO:	
1_PSEC_PLV_09_01_0_0	7-23-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

FREQUENCY CHART		
COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	771.69375
2	2	771.44375
3	3	771.14375
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	



- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
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CONNECTOR/SYMBOL LEGEND					
⌋	FEMALE "N" TYPE	□	BNC MALE	⌋	DIN FEMALE
⌋	MALE "N" TYPE	□	BNC FEMALE	⌋	DIN MALE
●	QMA MALE	⌋	DEUTSCH FEMALE	⌋	RT RIGHT ANGLE "N" TYPE
⌋	QMA FEMALE	⌋	DEUTSCH MALE	⌋	RT RIGHT ANGLE ADAPTOR
⌋	RJ45 MALE	□	DB 15	⌋	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

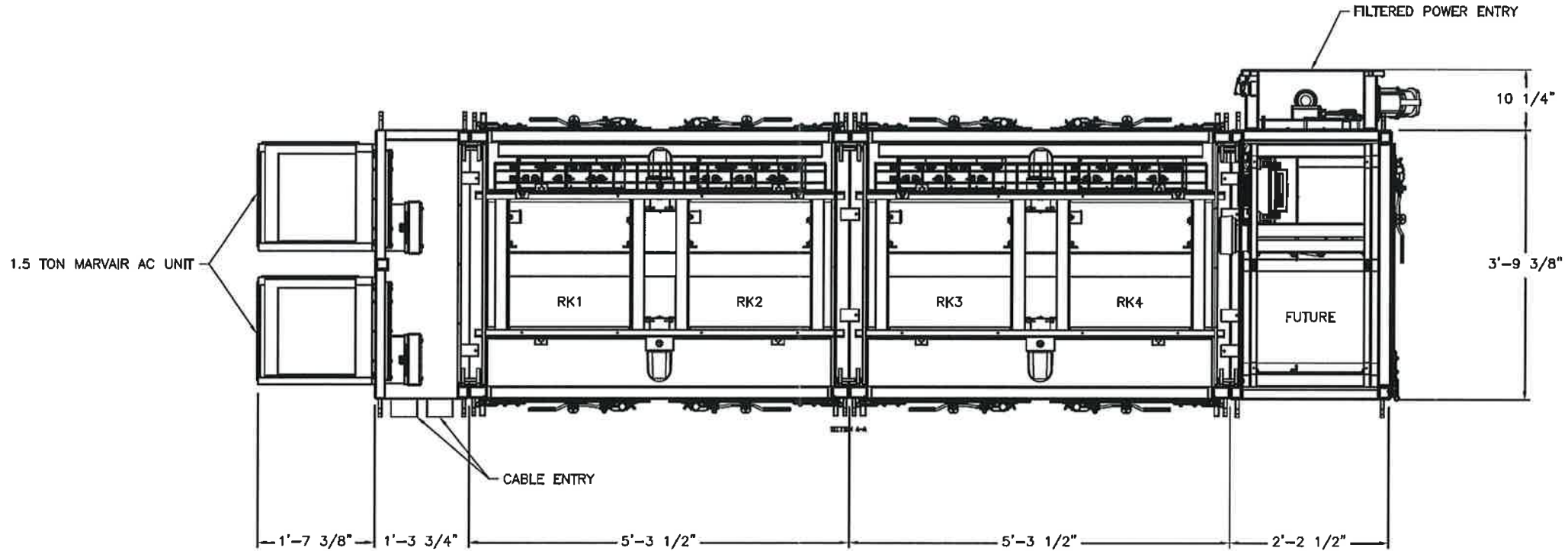
REV	DATE	BY	DESCRIPTION
8	8-27-10	L.T.	ORIGINAL RELEASE -- AS BUILT

MOTOROLA		NETWORKS AND ENTERPRISES	
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT			
TITLE: PALO VERDE SITE EQUIPMENT ANTENNA INTERCONNECT DIAGRAM			
CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: NONE
PROGRAM: AUTOCAD 2004	DRAWN: C. MAGNUSSON	CHECKED: L. TRAN	SHEET: 1 OF 1
FILE NAME: 1_PSEC_PLV_11_01_0_0	DATE: 7-26-10	PROJECT NUMBER: CA-04154B	DRAWING NO:

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_R62_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



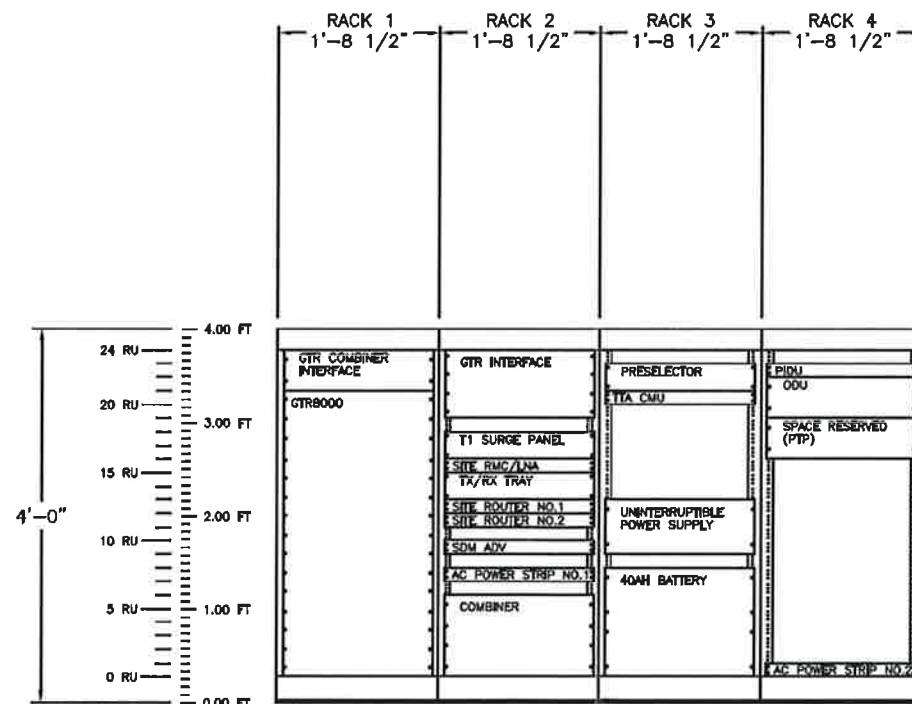
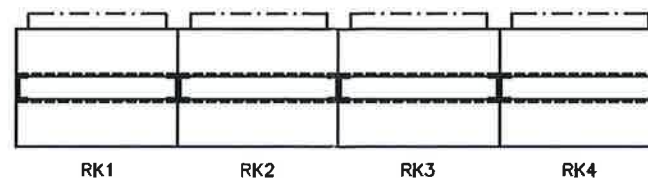
EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

H							PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT				
G							TITLE: ROAD 62 SITE EQUIPMENT ROOM FLOOR PLAN				
F							CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SIZE: D
E							PROGRAM: AUTOCAD 2004	DRAWN: V. PARKER	CHECKED: L. TRAN	SHEET: 1 OF 1	REV:
D							FILE NAME: 1_PSEC_R62_06_01_0_0	DATE: 7-23-10	PROJECT NUMBER: CA-04154B	DRAWING NO:	
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O		7-27-10	L.T.	ORIGINAL RELEASE -- AS BUILT							
REF. NO.		DATE	BY	DESCRIPTION							

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_R62_06_01_0_0.



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O	7-29-10	L.T.	ORIGINAL RELEASE -- AS BUILT
REF NO:	DATE	ENGR	DESCRIPTION

MOTOROLA NETWORKS AND ENTERPRISES

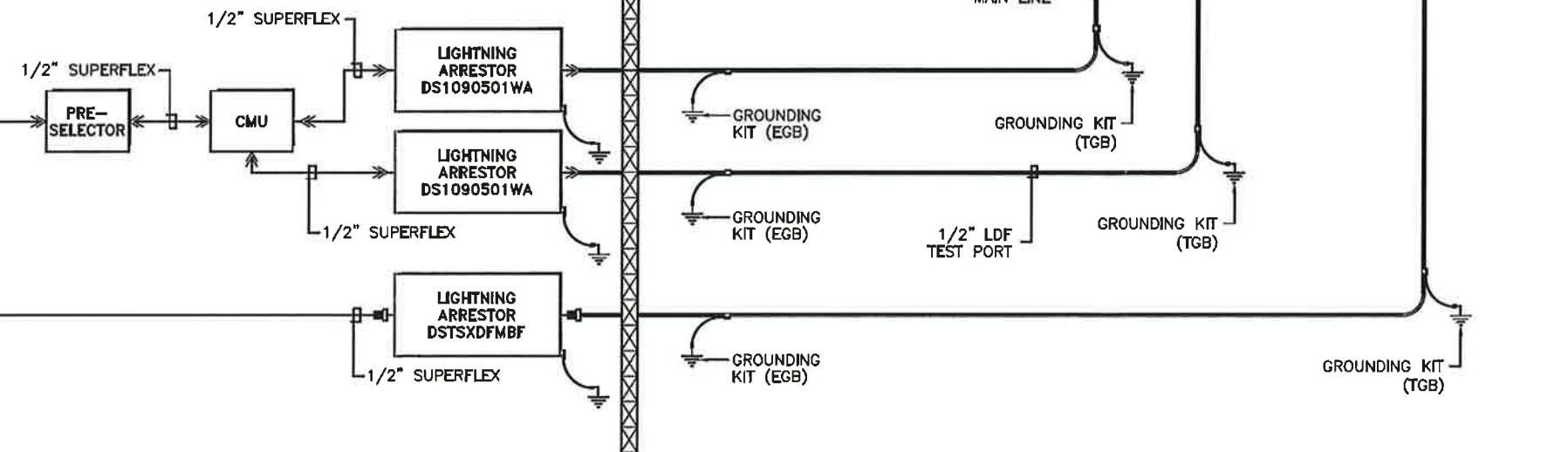
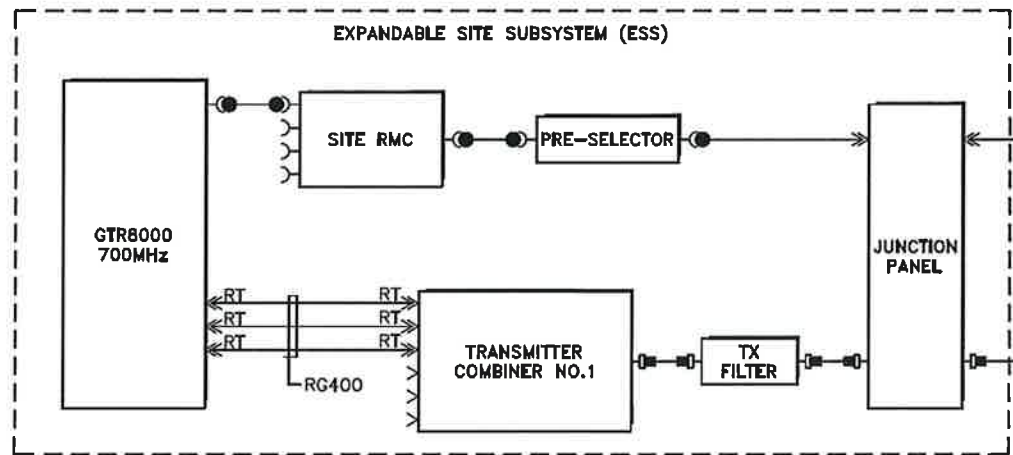
PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: ROAD 62 SITE
EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	DRAWN:	CHECKED:	DATE:	REV:
AUTOCAD 2004	V. PARKER	L. TRAN	7-23-10	1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO:	
1_PSEC_R62_06_01_0_0	7-23-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

FREQUENCY CHART		
COMBINER NO.1		
COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	774.70625
2	2	772.86875
3	3	772.69375
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	



- NOTES:
1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
 2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
 3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
 4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.

CONNECTOR/SYMBOL LEGEND					
⊂	FEMALE "N" TYPE	□	BNC MALE	⊃	DIN FEMALE
⊃	MALE "N" TYPE	⊂	BNC FEMALE	⊂	DIN MALE
●	QMA MALE	⊂	DEUTSCH FEMALE	⊂	RIGHT ANGLE "N" TYPE
⊂	QMA FEMALE	⊂	DEUTSCH MALE	⊂	RIGHT ANGLE ADAPTOR
⊂	RJ45 MALE	⊂	DB 15	⊂	50 OHM LOAD

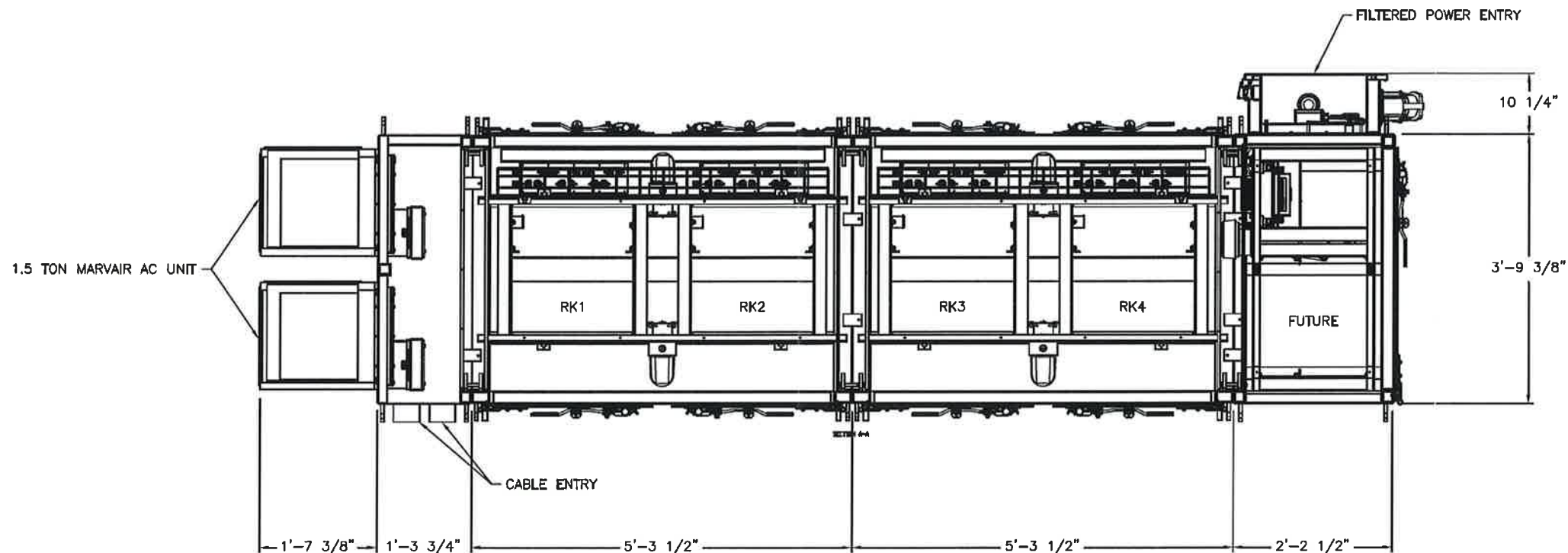
*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

MOTOROLA		NETWORKS AND ENTERPRISES	
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT			
TITLE: ROAD 62 SITE EQUIPMENT ANTENNA INTERCONNECT DIAGRAM			
CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:
	L. TRAN	B. WOOLLEY	NONE
PROGRAM:	CHECKED:	DATE:	SHEET:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO.:
1_PSEC_R62_11_01_0_0	7-26-10	CA-04154B	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_SNO_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

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O	7-27-10	LT.	ORIGINAL RELEASE -- AS BUILT
REV NO:	DATE	BY/NO:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES

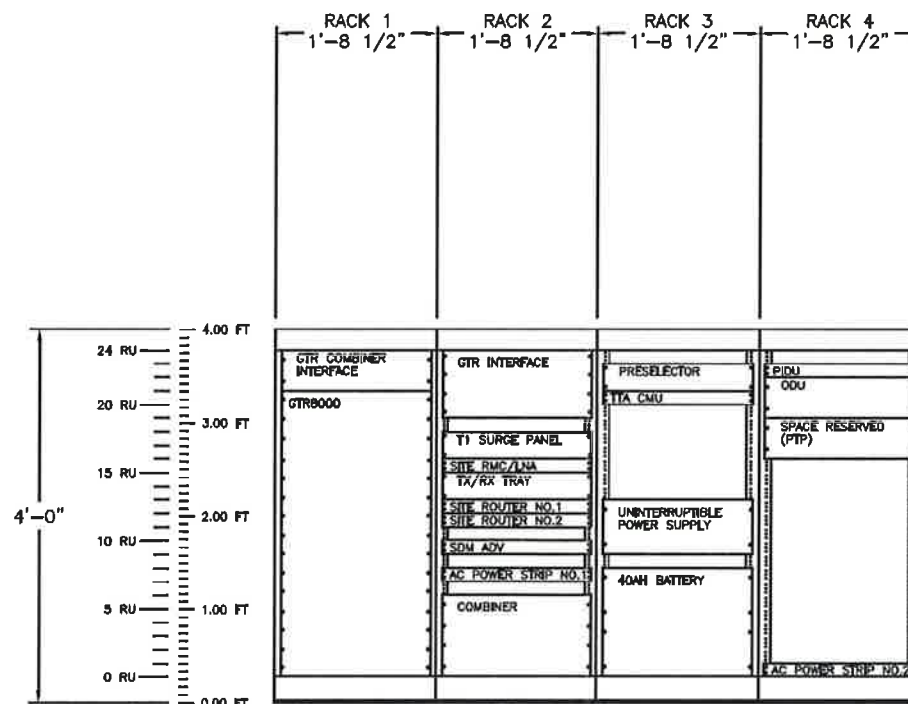
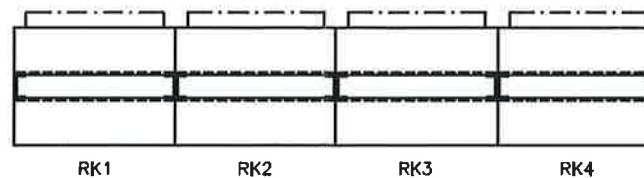
PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: SNOW PEAK SITE
EQUIPMENT ROOM FLOOR PLAN

CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SHEET: D
PROGRAM: AUTOCAD 2004	DRAWN: V. PARKER	CHECKED: L. TRAN	SHEET: 1 OF 1	REV: 0
FILE NAME: 1_PSEC_SNO_06_01_0_0	DATE: 7-23-10	PROJECT NUMBER: CA-04154B	DRAWING NO:	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:
 1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT,
 SEE DWG. NO. 1_PSEC_SNO_06_01_0_0.



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REV NO:	DATE	ENGR:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
 PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: SNOW PEAK SITE
 EQUIPMENT RACK FACE LAYOUT

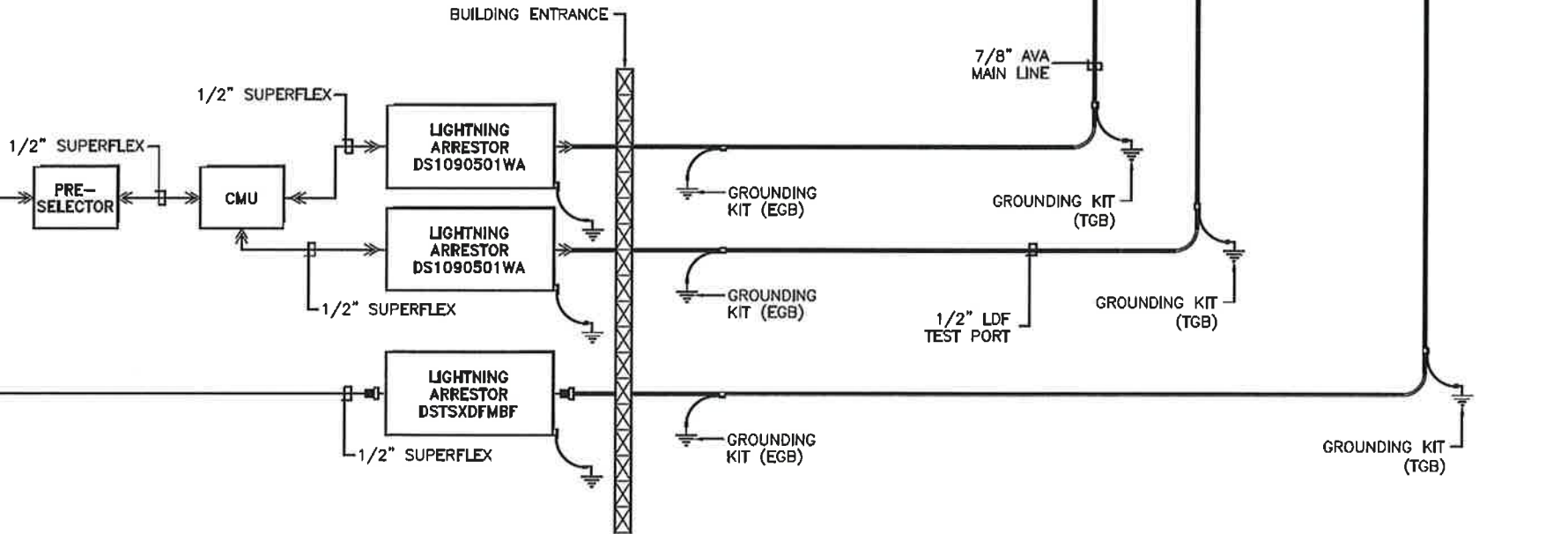
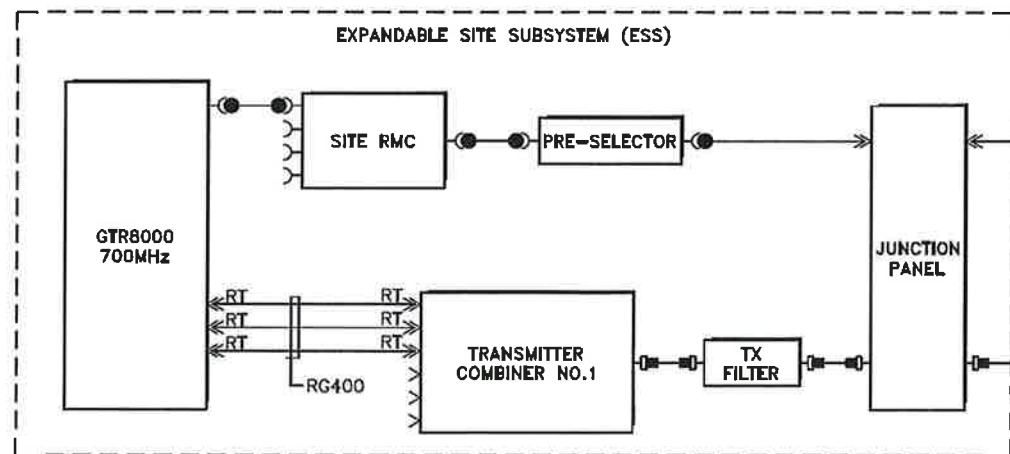
CONTRACT:	ENGINEER: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: 1"=1'	SHEET: D
PROGRAM: AUTOCAD 2004	DRAWN: V. PARKER	CHECKED: L. TRAN	SHEET: 1 OF 1	DATE: 7-23-10
FILE NAME: 1_PSEC_SNO_09_01_0_0	DATE: 7-23-10	PROJECT NUMBER: CA-041548	DRAWING NO.:	

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

FREQUENCY CHART

COMBINER NO.1

COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	772.31875
2	2	771.56875
3	3	771.34375
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	



NOTES:

1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.

CONNECTOR/SYMBOL LEGEND

⌋	FEMALE "N" TYPE	□	BNC MALE	⌋	DIN FEMALE
⌋	MALE "N" TYPE	□	BNC FEMALE	⌋	DIN MALE
●	QMA MALE	⌋	DEUTSCH FEMALE	⌋	RT RIGHT ANGLE "N" TYPE
⌋	QMA FEMALE	⌋	DEUTSCH MALE	⌋	RT RIGHT ANGLE ADAPTOR
⌋	RJ45 MALE	⌋	DB 15	⌋	50 OHM LOAD

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

REV NO.	DATE	BY:	DESCRIPTION:
0	8-27-10	LT.	ORIGINAL RELEASE -- AS BUILT

MOTOROLA NETWORKS AND ENTERPRISES

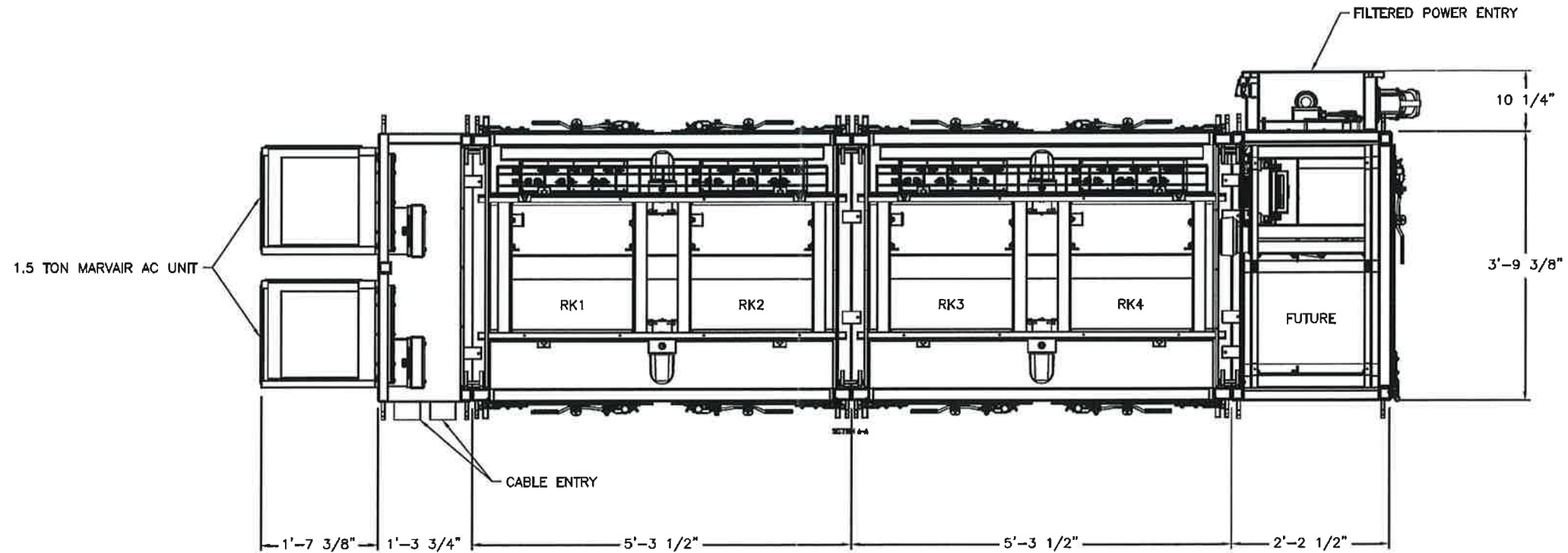
PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: SNOW PEAK SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT:	DESIGNED BY: L. TRAN	PROJECT MANAGER: B. WOOLLEY	SCALE: NONE	SHEET: D
PROGRAM: AUTOCAD 2004	DRAWN BY: C. MAGNUSSON	CHECKED BY: L. TRAN	SHEET: 1 OF 1	REV: 0
FILE NAME: H_PSEC_SNO_11_01_0_0	DATE: 7-29-10	PROJECT NUMBER: CA-04154B	DRAWING NO.:	

NOTES:

1. EQUIPMENT RACK NUMBERS ARE LOCATED ON THE FRONT SIDE OF EQUIPMENT.
2. FOR EQUIPMENT RACK FACE LAYOUT, SEE DWG. NO. 1_PSEC_TOR_09_01_0_0.
3. RACK INFORMATION:
 RK1 = RF EQUIPMENT
 RK2 = ROUTERS & MOSCAD
 RK3 = TTA, UPS, & DC BATTERY
 RK4 = PTP EQUIPMENT



EQUIPMENT ROOM FLOOR PLAN - PLAN VIEW

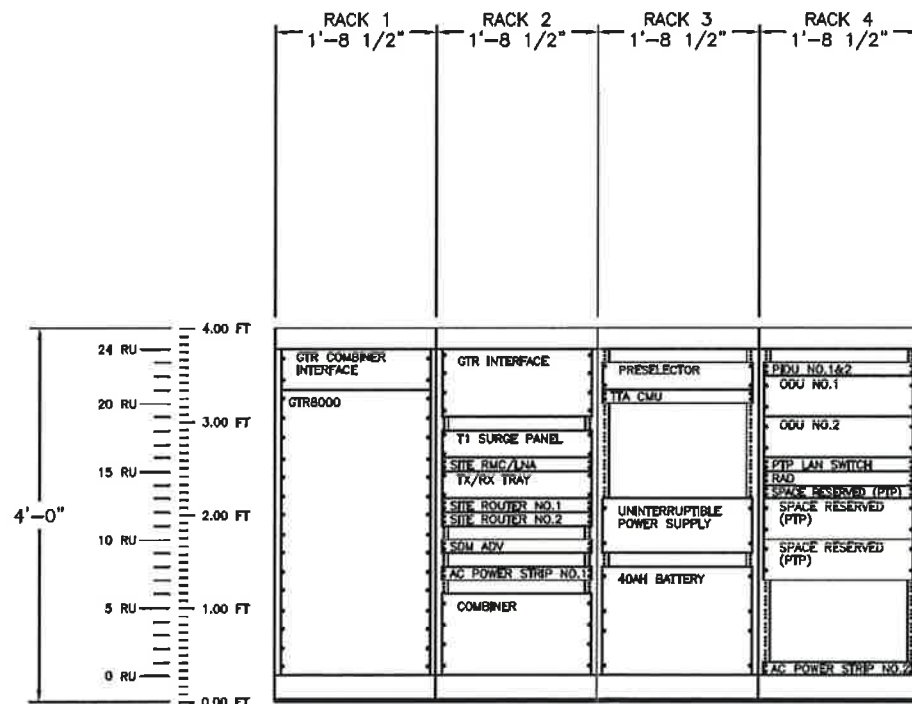
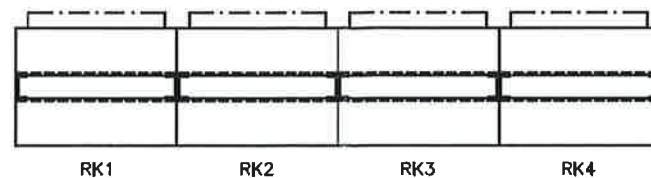
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REV	NO:	DATE	ENGR: DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES				
PROJECT: COUNTY OF RIVERSIDE PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT				
TITLE: TORO PEAK SITE EQUIPMENT ROOM FLOOR PLAN				
CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	OWNER:	CHECKED:	DRAWN:	POST:
AUTOCAD 2004	V. PARKER	L. TRAN		1 OF 1
FILE NAME:	DATE:	PROJECT NUMBER:	DRAWING NO.:	
1_PSEC_TOR_09_01_0_0	7-23-10	CA-041154B		

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.

NOTES:

1. FOR EQUIPMENT ROOM EQUIPMENT LAYOUT, SEE DWG. NO. 1_PSEC_TOR_06_01_0_0.



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REF NO:	DATE	BY:	DESCRIPTION:

MOTOROLA NETWORKS AND ENTERPRISES

PRODUCT: COUNTY OF RIVERSIDE
 PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: TORO PEAK SITE
 EQUIPMENT RACK FACE LAYOUT

CONTRACT:	ENGINEER:	PROJECT MANAGER:	SCALE:	SHEET:
	L. TRAN	B. WOOLLEY	1"=1'	D
PROGRAM:	DRAWN:	CHECKED:	SHEET:	REV:
AUTOCAD 2004	V. PARKER	L. TRAN	1 OF 1	
FILE SERIES:	DATE:	PROJECT NUMBER:	UNIVERSITY NO:	
1_PSEC_TOR_06_01_0_0	7-23-10	CA-04154B		

ORIGINAL DOCUMENT SIZE IS 22X34, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

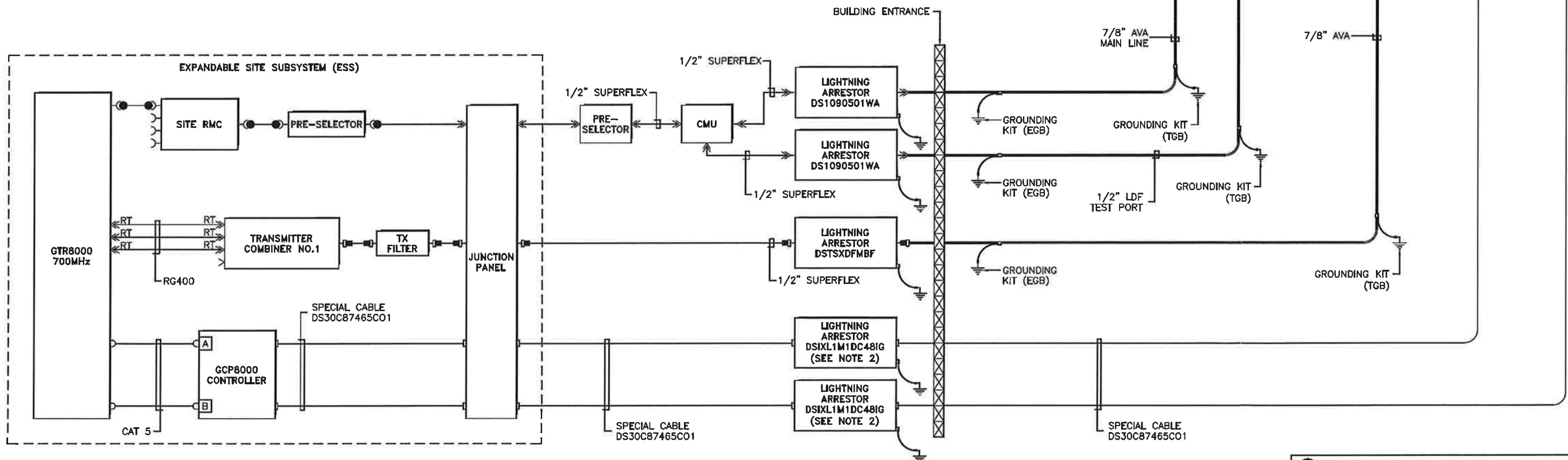
FREQUENCY CHART

COMBINER NO.1

COMBINER PORT	CHANNEL NO.	TX FREQUENCY
1	1	770.31875
2	2	770.04375
3	3	769.54375
4	RESERVED FOR FUTURE	
5	RESERVED FOR FUTURE	
6	RESERVED FOR FUTURE	

NOTES:

1. TOWER TOP AMPLIFIER (TTA) WILL DRAW POWER FROM CONTROL MONITORING UNIT(CMU).
2. GPS LIGHTNING ARRESTOR DOES NOT HAVE TRADITIONAL CONNECTORS ON EACH END. THE REMOTE GLOBAL POSITIONING SYSTEM (RGPS) CABLE NEEDS TO BE CUT AND SPECIFIC PAIRS OF WIRES NEED TO BE TERMINATED ON SCREW TERMINALS ON EITHER SIDE OF THE GPS LIGHTNING ARRESTOR.
3. ALL GROUNDING KITS TO BE INSTALLED PER R56 REQUIREMENTS.
4. REFER TO TOWER DRAWING FOR ANTENNA DETAILS.



CONNECTOR/SYMBOL LEGEND

Female "N" Type	BNC Male	DIN Female
Male "N" Type	BNC Female	DIN Male
QMA Male	Deutsch Female	Right Angle "N" Type
QMA Female	Deutsch Male	Right Angle Adaptor
RJ45 Male	DB 15	50 Ohm Load

*CONNECTORS AND CORRESPONDING CABLES ARE EQUAL IN SIZE UNLESS OTHERWISE SPECIFIED.

MOTOROLA NETWORKS AND ENTERPRISES

PROJECT: COUNTY OF RIVERSIDE
PUBLIC SAFETY ENTERPRISE COMMUNICATION (PSEC) PROJECT

TITLE: TORO PEAK SITE
EQUIPMENT ANTENNA INTERCONNECT DIAGRAM

CONTRACT: AUTOCAD 2004	ENGINEER: M. CRUZ	PROJECT MANAGER: B. WOOLLEY	SCALE: NONE	SHEET: 1 OF 1
FILE NAME: 1_PSEC_TOR_11_01_0_0	DATE: 7-29-10	PROJECT NUMBER: CA-041154B	DRAWING NO:	

REV NO: DATE: WORK: DESCRIPTION: ORIGINAL RELEASE - AS BUILT

ORIGINAL DOCUMENT SIZE IS 22X34. CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED.