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\*\*Please read the Technical & Submittal Requirements before completing/submitting your application. \*\*

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#### **REGIONAL WIRELESS COOPERATIVE**

Radio Amplification System Rebroadcast Authorization Application

Pursuant to the Regional Wireless Cooperative (RWC) Radio Amplification Systems Policy, Section 5.1; and 47CFR 90.219, entities desiring to operate radio amplification systems on the RWC's licensed frequencies and within the service area of the RWC network must obtain written consent and approval from the licensee. Upon successful initial review of this document the RWC will provide a separate written acceptance of plans for construction. Following the successful completion of a field test by the RWC this signed document shall serve as written consent and approval to rebroadcast on RWC Spectrum.

### PAGE 1 - APPLICANT INFORMATION (To be completed by applicant)

Proposed ERRCS Site Information:	Date Submitted:			
Location Name:				
Street Address:				
City:	State: Zip Code:			
Facility Owner Contact Information	<b>Facility Occupant Contact Information</b>			
Name:	Name:			
Address:	Address:			
City: State: Zip:	City: State: Zip:			
Phone:	Phone:			
Email:	Email:			
Engineering Agent/Vendor Contact Information	Expected system activation date:			
Name:	ERRCS System Latitude:			
Address:	ERRCS System Longitude:			
City: State: Zip:	Donor Antenna Height Above Ground Ft.			
	AHJ Contact Name:			
Phone:	Phone:			
Email:	Email:			
Items to include with application:				
<ul> <li>Facility floor plan for all building levels including block diagram an make/model numbers.</li> <li>Pre-treatment test report.</li> </ul>	uding square footage of each floor. d itemized list of system components including manufacturer and			
Submit Application and Attachments to (Co	mpleted by RWC):			
Email to: rwcazerrcs@phoenix.gov	CC Email to:			



### **REGIONAL WIRELESS COOPERATIVE**

Radio Amplification System Rebroadcast Authorization Application

## PAGE 2 - LICENSEE AUTHORIZATION (To be completed by licensee)

Donor Site Information:	
Donor Site:	Simulcast:
Street Address:	
City:FCC Call	Sign:
Donor Site Lat/Long: °	
Donor Antenna Site DistanceMiles. Donor	Antenna Site AzimuthDegrees
LICENSEE	AUTHORIZATION
agent of the licensee operating on a RWC Memb	equirements provided on this application, the authorized er's licensed frequencies and within the service area of oves activation of the radio amplification system as
maintained in accordance with RWC policy. Chan	the ERRC system described in this document is properly ges to the RWC P-25 network may require alterations to local point of contact to facilitate access in the event of
of annual inspections is the sole responsibility of	require annual inspections to be completed. Scheduling f the system owner or their designated representative. thority Having Jurisdiction (AHJ) for questions regarding
For questions about the RWC, its policies and don	or site info see: https://rwcaz.org
Authorized Signature:	Title:
Print Name:	Entity:
Data	



## **RWC Technical Requirements for ERRCS**

For new BDA's either due to new construction or retrofits/repairs:

- Class A amplifiers (see FCC 47 CFR 90.219 (a)) must be used for any ERRCS installed to operate on the RWC 700 MHz P25 network
- Existing Class B amplifiers must continue to be maintained on an annual basis.
   If an existing Class B amplifier fails, it must be replaced with a Class A amplifier
- The BDA shall support uplink squelch
- The BDA must have AGC Automatic Gain Control

### **BDA Configuration**

- BDA maximum uplink and downlink gain settings shall be 20dB less than isolation measured between donor antenna and the DAS.
- All appropriate RWC frequencies shall be programmed into the BDA
- Typical filter configuration shall be 12.5 kHz unless approved by the RWC
- Uplink Squelch should be enabled

#### **Donor Antenna**

- The donor antenna shall be a directional antenna.
- The donor antenna frequency range shall support 700 MHz public safety band, 769-775 MHz (downlink) and 799-805MH.z (uplink)
- For DAS projects requesting design approval after August 1, 2024, the donor antenna shall support:
  - A horizontal beamwidth of 30 degrees or less
  - A vertical beamwidth of 30 degrees or less
  - A front-to-back ratio of 27db or greater

Antennas that meet this requirement are listed below. If other antennas are discovered that meet these requirements, please feel free to update us.

- 1) ADRF: AD-PA-700-900-DIN-X
- 2) Gamma Nu: F16V28DHFB
- 3) Ventey: VHG-VL3015-ODNF
- 4) Comba: ODP-030V14MN
- The donor antenna must be placed and oriented with unobstructed view of the donor site. This criterion is concerned principally with near field obstructions such as parapets, HVAC units, ducting, screen walls, etc. Antennas need to be secured clearly above any near field obstacles. Wind loading should be considered when installing and securing antennas. Line of sight buildings or other obstructions will be considered by the RWC during uplink testing.



• The donor antenna must be oriented at the pre-approved donor site mentioned in the plan's acceptance document given with plans approval.

## **RWC DAS Technical Requirements**

• Filtration to remove nearby saturating cellular noise or other signals may be required.

#### Fiber DAS

- For new DAS projects and DAS projects added to campuses or developments with the following characteristics must incorporate the new building's DAS into the fiber DAS, rather than adding a new BDA with a new donor antenna.
  - Building campuses with one address or parcel identified by the county assessor's office.
  - o Buildings are connected or within 1000' and are of the same ownership.
- If a building requires more than a single BDA, per the manufacture installation recommendations, then an ERRCS fiber DAS system installation would be required.

# Regional Wireless Cooperative (RWC)

Plan Submittal Requirements (\*\*for RWC use only\*\*)

1		Purpose of Requirements		
		<ul> <li>To protect the integrity of the RWC Radio Network from interference sources.</li> <li>To eliminate unapproved equipment or undesirable design decisions.</li> <li>To better align RWC approval with AHJ requirements.</li> </ul>		
2		Submittal Review	Comments	
2.1	Submittals	<ul> <li>Qualifications</li> <li>Construction floor plans</li> <li>One-line diagram</li> <li>Equipment list</li> <li>Equipment cut sheets</li> <li>Riser Diagram</li> <li>Baseline pre-treatment signal level report with proper RWC donor site and channel data</li> </ul>		
		□ RWC Radio Amplification System Authorization Form		
2.2	Qualifications	<ul> <li>FCC GROL (Required by Fire)</li> <li>Certificate issued by the manufacturer of the active RF equipment being installed</li> <li>NICET IB-PSC certifications for both designer and qualified staff performing the commissioning</li> </ul>		
2.3	Construction Floor Plans	<ul> <li>Show the location with unique labels of each cable, splitter, coupler, tapper, antenna, BDA, fiber-fed remote, and donor antenna</li> </ul>		
2.4	One-line Diagram	<ul> <li>Must present the cable connections between all DAS antennas and the donor antenna, including connections to external filters, splitters, directional couplers, tappers, fiber-fed remotes, the BDA, and lighting arrestors</li> <li>Must include unique labels for each component</li> </ul>		

2.5	Equipment List	DAS equipment list shall include the following components, if present:    BDA   Fiber-fed remote   Coaxial Cable   Donor Antenna   DAS/Service Antennas   Lightning arrestor   Splitters/Couplers/Tappers   External Filters
2.6	Equipment	For each component in the equipment list, please provide:  Manufacturer  Model number  Manufacturer information sheets shall be provided for each
2.0	Cut Sheets	item on the DAS equipment list
2.7	Riser Diagram	<ul> <li>□ Riser diagram to include splitters and service antennas, donor antenna, BDA</li> <li>□ Riser diagram to show all floors of a project that is treated with DAS</li> </ul>
2.8	Baseline Signal Levels	Pre-treatment grid test (if possible) including the proper frequencies for the project location
2.9	RWC Form	□ Page one of the RWC Radio Amplification System Authorization Form filled out
		**The form can be found on page two of this packet.**

**ERRCS Location** 

Miles

Azimuth

degrees

**Donor site** 

Antenna Ant Height

AGL Ft

80@195°

**ERP Watts** 

	Simulo	ast A		Simulca	st A/B Si	
	700 MHz (	channels	Site Name	Site Name Address		
Chnl#	Freq (Mhz)		СТҮН	200 W. Washington St	33-26-5	
1	771.68125	<b>Control Channel</b>	FS34	50 N. 51st Ave	33-26-5	
2	771.79375	<b>Control Channel</b>	GLEN	4020 W. Glenrosa Ave	33-29-5	
3	772.18125	<b>Control Channel</b>	AMTN	23060 N. 27th Ave	33-41-4	
4	772.04375	<b>Control Channel</b>	MGIL	701 W. Carefree Hwy	33-47-3	
5	771.93125		NMTN	10600 N. 7th St	33-35-0	
6	772.29375		SQPW	6202 N 24th St	33-31-5	
7	772.48125		SAPT	3400 E. Sky Harbor Blvd	33-26-0	
8	772.54375		GNWY	15040 N. Tatum Blvd	33-37-2	
9	772.73125		DOVE	33003 N. 52nd St	33-47-0	
10	772.79375		ARCA	5220 E. Thomas Rd	33-28-4	
11	772.93125		ASUW	4450 W. Sweetwater Rd	33-36-1	
12	774.73125					
13	773.18125		Sį	pecial Frequency Programm	ing Plan to	
14	773.43125		#	Freq (Mhz)		
15	774.23125		1	770.83125	12	
16	774.48125		2	771.13125	12	
	C:l-	D	3	771.18125	12	
	Simulo	ast B	4	771.38125	12	
	700 MHz	channels	5	771.43125	12	
Chnl#	Freq (Mhz)		6	771.63125	12	
1	770.83125	Control Channel	7	771.68125	12	
2	771.18125	<b>Control Channel</b>	8	771.79375	12	
3	771.13125	<b>Control Channel</b>	9	771.88125	12	
4	771.43125	<b>Control Channel</b>	10	771.93125	12	
5	771.38125		11	771.98125	12	
6	771.98125		12	772.04375	12	
7	771.63125		13	772.13125	12.	
8	772.23125		14	772.18125	12	
9	771.88125		15	772.23125	12	
10	772.43125		16	772.29375	12	
11	772.13125		17	772.38125	12.	
12	772.68125		18	772.45625	75	
13	772.38125		19	772.54375	12	
14	772.63125		20	772.63125	12	
15	772.88125		21	772.68125	12	
16	773.13125		22	772.73125	12	
17	773.38125		23	772.79375	12.	
18	773.68125		24	772.88125	12.	
			25	772.93125	12.	
			26	773.15625	75	
			27	773.38125	12	
			28	773.43125	12.	

774.23125

774.48125

774.73125

12.5 Khz (Chnl A15)

12.5 Khz (Chnl A16)

12.5 Khz (Chnl A12)

		Simulcas	st A/B Site Info	
	Site Name	Address	Lat/Long	Call Sign
	СТҮН	200 W. Washington St	33-26-55.2 N, 112-04-38.5 W	WQSE305
	FS34	50 N. 51st Ave	33-26-57.1 N, 112-10-10.8 W	WQSE304
	GLEN	4020 W. Glenrosa Ave	33-29-56.2 N, 112-08-46.5 W	WQSE303
	AMTN	23060 N. 27th Ave	33-41-43.1 N, 112-07-09.0 W	WQSE288
	MGIL	701 W. Carefree Hwy	33-47-31.1 N, 112-05-08.5 W	WQSE280
	NMTN	10600 N. 7th St	33-35-08.1 N, 112-04-20.5 W	WQSE298
	SQPW	6202 N 24th St	33-31-54.2 N, 112-01-50.5 W	WQSE307
	SAPT	3400 E. Sky Harbor Blvd	33-26-07.2 N, 112-00-34.5 W	WQSE309
	GNWY	15040 N. Tatum Blvd	33-37-25.3 N, 111-58-43.9 W	WQSE302
	DOVE	33003 N. 52nd St	33-47-09.0 N, 111-58-08.0 W	WQSE283
	ARCA	5220 E. Thomas Rd	33-28-49.8 N, 111-58-06.1 W	WQSF638
	ASUW	4450 W. Sweetwater Rd	33-36-18.8 N, 112-09-18.0 W	WQSE292
	Sr	pecial Frequency Programm	ing Plan to fit 32 Filters	1
	#	Freq (Mhz)	Filter	
	1	770.83125	12.5 Khz (Chnl B1)	
	2	771.13125	12.5 Khz (Chnl B3)	
	3	771.18125	12.5 Khz (Chnl B2)	
	4	771.38125	12.5 Khz (Chnl B5)	
	5	771.43125	12.5 Khz (Chnl B4)	
	6	771.63125	12.5 Khz (Chnl B7)	
	7	771.68125	12.5 Khz (Chnl A1)	
	8	771.79375	12.5 Khz (Chnl A2)	
	9	771.88125	12.5 Khz (Chnl B9)	
	10	771.93125	12.5 Khz (Chnl A5)	
	11	771.98125	12.5 Khz (Chnl B6)	
	12	772.04375	12.5 Khz (Chnl A4)	
	13	772.13125	12.5 Khz (Chnl B11)	
	14	772.18125	12.5 Khz (Chnl A3)	
	15 16	772.23125 772.29375	12.5 Khz (Chnl B8) 12.5 Khz (Chnl A6)	
	17	772.38125	12.5 Khz (Chnl B13)	
	18	772.45625	75 Khz (A7 & B10)	
	19	772.54375	12.5 Khz (Chnl A8)	
	20	772.63125	12.5 Khz (Chnl B14)	
	21	772.68125	12.5 Khz (Chnl B12)	
	22	772.73125	12.5 Khz (Chnl A9)	
	23	772.79375	12.5 Khz (Chnl A10)	
	24	772.88125	12.5 Khz (Chnl B15)	
	25	772.93125	12.5 Khz (Chnl A11)	
	26	773.15625	75 Khz (A13 & B16)	
	27	773.38125	12.5 Khz (Chnl B17)	
	28	773.43125	12.5 Khz (Chnl A14)	
	29	773.68125	12.5 Khz (Chnl B18)	
nii)	20	774 22425	12 F Kh- (Chal A1F)	

	Simulcast C				
	700 MHz	channels			
Chnl#	Freq (Mhz)				
1	770.10625	CONTROL CHANNEL			
2	772.10625	<b>CONTROL CHANNEL</b>			
3	770.35625	<b>CONTROL CHANNEL</b>			
4	772.35625	<b>CONTROL CHANNEL</b>			
5	769.60625				
6	771.60625				
7	769.85625				
8	771.85625				
9	769.10625				
10	772.60625				
11	769.35625				
12	772.85625				
13	770.60625				
14	770.85625				
15	771.10625				
16	771.35625				

	Simulcast C Site Info					Simulcast C Site Info  Donor site Antenna				RCS ation
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees			
HAMI	911 S. Hamilton	33-17-34.9 N, 111-49-55.6 W	WQSH547	90	178					
TFTC	1342 E. University Ave	33-25-24.3 N, 111-54-59.1 W	WQSH547	90	108					
DPSS	12717 S. Central Ave	33-19-57.2 N, 112-04-00.5 W	WQSH547	200	65@150°					
TPDS	8201 S. Hardy Dr	33-20-27.2 N, 111-57-10.5 W	WQSH547	90	130					
CFTC	3550 S. Dobson Rd	33-15-11.4 N, 111-53-17.1 W	WQSH547	320	75@160°					
MARC	45695 W. Edison Rd	33-03-55.7 N, 112-03-39.4 W	WQWW222	100	145@110°					

Simulcast D				
	700 MHz ch	annels		
Chnl#	Freq (Mhz)			
1	772.081250	CONTROL CHANNEL		
2	772.331250	CONTROL CHANNEL		
3	772.581250	<b>CONTROL CHANNEL</b>		
4	772.831250	CONTROL CHANNEL		
5	773.156250			
6	773.406250			

	Simulcast D Site Info				Donor site Antenna		RCS ation
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
OCTR	43240 N. Black Canyon Fwy	33-52-35.1 N, 112-08-51.0 W	WQSF641	100	100		
F141	43814 N. New River Rd	33-53-00.0 N, 112-04-23.2 W	WQRY628	50	125		
F146	3116 W. New River Rd	33-55-17.1 N, 112-07-41.5 W	WQRY628	50	125		

Simulcast F				
	700 MH	z channels		
Chnl#	Freq (Mhz)			
1	774.41875	CONTROL CHANNEL		
2	773.16875	CONTROL CHANNEL		
3	771.91875	CONTROL CHANNEL		
4	774.16875	CONTROL CHANNEL		
5	772.91875			
6	771.66875			
7	773.91875			
8	772.66875			
9	771.41875			
10	773.66875			
11	772.41875			
12	771.16875			
13	773.41875			
14	772.16875			
15	772.55625			
16	772.80625			

Simulcast F Site Info				Donor site Antenna		ERRCS Location	
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
TFTC	1342 E. University Dr	33-25-24.3 N, 111-54-59.1 W	WQJR969	55	134		
TPDS	8201 S. Hardy Dr	33-20-27.2 N, 111-57-10.5 W	WQJR969	50	100		
PGWT	245 E. Marigold Ln	33-26-43.3 N, 111-56-21.6 W	WQJR969	120	107@135°		
BBUT	1705 W. Broadway Rd	33-24-24.1 N, 111-58-02.5 W	WQJR969	55	35		
SMTN	12717 S. Central Ave	33-20-04.9 N, 112-03-35.4 W	WQJR969	110	96@075°		

Simulcast G						
700 MHz channels						
Chnl#	Freq (Mhz)					
1	771.56875	<b>Control Channel</b>				
2	771.61875	<b>Control Channel</b>				
3	771.06875	<b>Control Channel</b>				
4	771.86875	<b>Control Channel</b>				
5	770.56875					
6	772.11875					
7	770.06875					
8	772.36875					
9	769.56875					
10	772.61875					
11	772.05625					
12	772.86875					
13	771.31875					
14	770.81875					
15	770.31875					
16	769.81875					
17	769.31875					
18	772.30625					

Simulcast G Site Info				Donor site Antenna		ERRCS Location	
Site Name	Address	Lat/Long	Call Sign	ERP Watts			Azimuth degrees
GWTP	7300 W. Greenway Rd	33-37-34.9 N, 112-12-51.1 W	WQKP324 WQJY471	40	95		
TCTR	8343 W. Monroe St	33-34-37.4 N, 112-14-17.5 W	WQKP323 WQJY471	35	75		
AFWT	9510 W. Lone Mountain Pkwy	33-44-22.6 N, 112-15-51.8 W	WQKP323 WQJY471	40	75		
WADD	41835 N. Castle Hot Springs Rd	33-50-48.2 N, 112-16-38.1 W	WQKP323 WQJY471	18	60		
LAFB	969 Super Saber St Luke AFB	33-31-50.9 N, 112-22-00.6 W	WQKN967 WQKP324	38	250		
GLPD	6835 N. 57th Dr	33-32-14.6 N, 112-10-55.8 W	WQKN967 WQKP324	35	80		
F195	23100 N. Lake Pleasant Rd	33-41-33.9 N, 112-16-42.6 W	WQKN967 WQKP324	40	95		
TWTP	9501 W. Pima St	33-25-43.7 N, 112-15-41.9 W	WQKP324 WQJY471	90	155		
PYPK	28345 N. Pyramid Peak Pkwy	33-44-25.8 N, 112-11-39.0 W	WQZS652	37	118		
SPA2	15667 W. Planada Ln	33-41-35.9 N, 112-23-51.7 W	WROP432	32	130		

Simulcast H							
700 MHz channels							
Chnl#	Chnl# Freq (Mhz)						
1	771.84375	<b>Control Channel</b>					
2	771.59375	<b>Control Channel</b>					
3	771.34375	<b>Control Channel</b>					
4	771.09375	<b>Control Channel</b>					
5	770.84375						
6	770.59375						
7	770.34375						
8	770.09375						
9	769.84375						
10	769.59375						
11	769.09375						
12	769.34375						

Simulcast H Site Info			Donor Site Antenna		ERRCS Location		
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Distance Miles	Azimuth degrees
SCIV	3700 N. 75th St	33-29-19.4 N, 111-55-15.9 W	WQJU870	500	110@180°		
S042	26906 N. Pima Rd	33-43-45.8 N, 111-53-36.5 W	WQJU870	85	65		
SDMH	12575 E. Via Linda	33-35-17.3 N, 111-48-28.8 W	WQJU870	100	65		
F610	16701 N. 100th St	33-38-08.0 N, 111-51-49.5 W	WQJU870	140	40		
F614	27775 N. Alma School Rd	33-44-13.2 N, 111-50-41.7 W	WQJU870	68	60		
S089	39205 N Alister Mckenzie Dr	33-50-32.2 N, 111-52-35.3 W	WQJU870	70	50@180°		
SCSE	12177 Calle Serena	33-41-26.9 N, 111-49-00.6 W	WQJU871	110	20@0°		
DOVE	33003 N 52nd St	33-47-09.5 N, 111-58-08.6 W	WQJU871	425	130@90°		
PVRF	6827 E. Highlands Dr	33-32-10.3 N, 111-59-19.6 W	WQJU871	95	24@180°		

Simulcast J							
	700 MHz channels						
Chnl#	Chnl# Freq (Mhz)						
1	769.11875	<b>Control Channel</b>					
2	769.36875	<b>Control Channel</b>					
3	769.61875	<b>Control Channel</b>					
4	769.86875	<b>Control Channel</b>					
5	770.11875						
6	770.36875						
7	772.78125						
8	774.18125						
9	773.93125						

Simulcast J Site Info				Donor Site Antenna		ERRCS Location	
Site Name	Site Name Address Lat/Long Call Sign		ERP Watts	Ant Height AGL Ft	Distance Miles	Azimuth degrees	
ATWR	26596 W. Lower Buckeye	33-25-22.2 N, 112-38-04.4 W	WQJG713	56	185	wiies	ucgrees
FEST	28016 W. Sun Valley Pkwy	33-39-34.5 N, 112-39-18.0 W	WQJG713	87	107		
ESTR	11461 S. 171st Ave	33-20-46.0 N, 112-25-20.0 W	WQJG713	45	150		
RBVW	16699 S. Rainbow Valley Rd	33-17-41.2 N, 112-26-56.1 W	WQJG713	80	105@170°		
GCOM	14455 W. Van Buren St	33-26-51.8 N, 112-22-09.4 W	WQJG713	100	105		