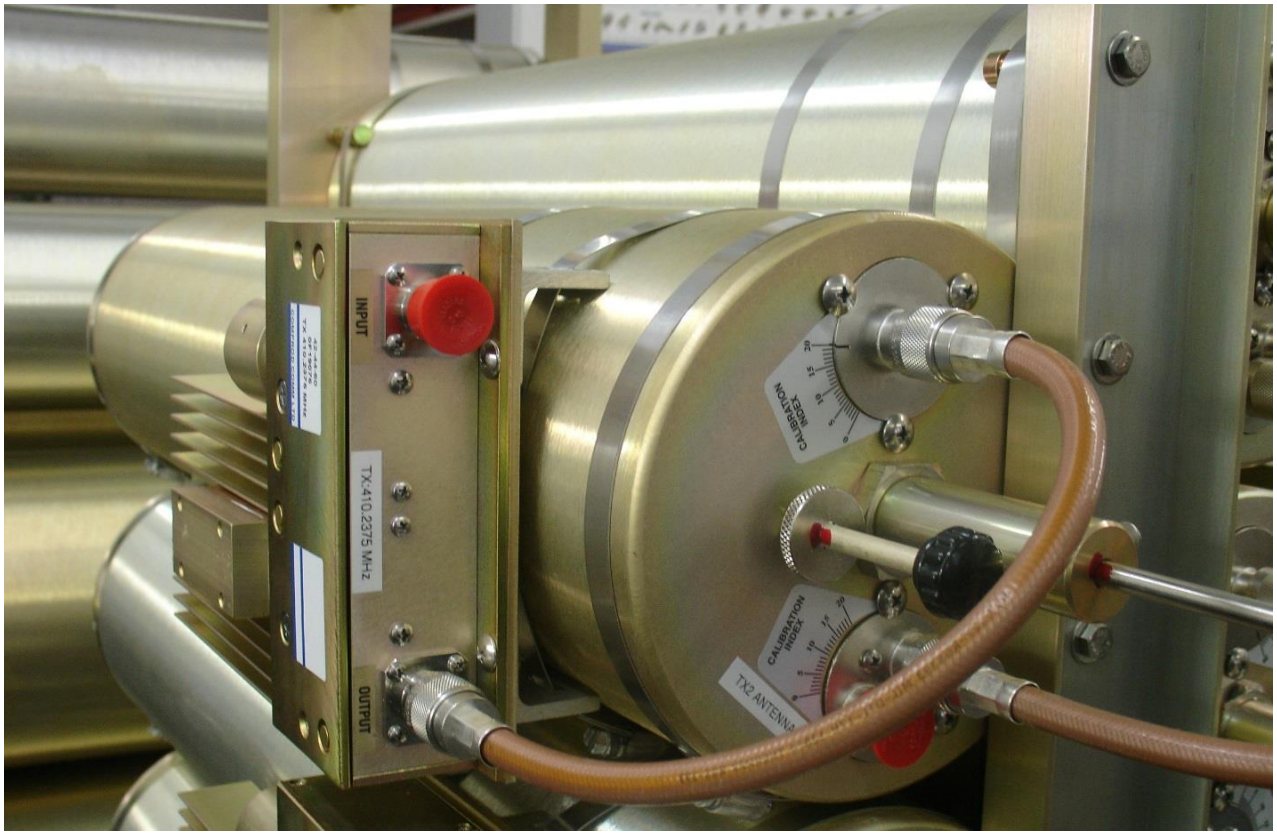
Filters and Components

Our **filters** have been selected by some of the leading Public Safety organizations across North America to **ensure Mission-Critical performance** for their RF networks. Comprod **manufactures each cavity filter in North America** – skilled RF technicians, quality calibration, and insistence on high-quality plating materials. This ensures that the filter **performance will be optimal**, tuning can be easily **performed by your technicians**, and the RF signals remain as pure and clean as possible. Our customers notice the difference in **quality and reliability**.



CAVITY FILTER DESIGN

Types of Loops

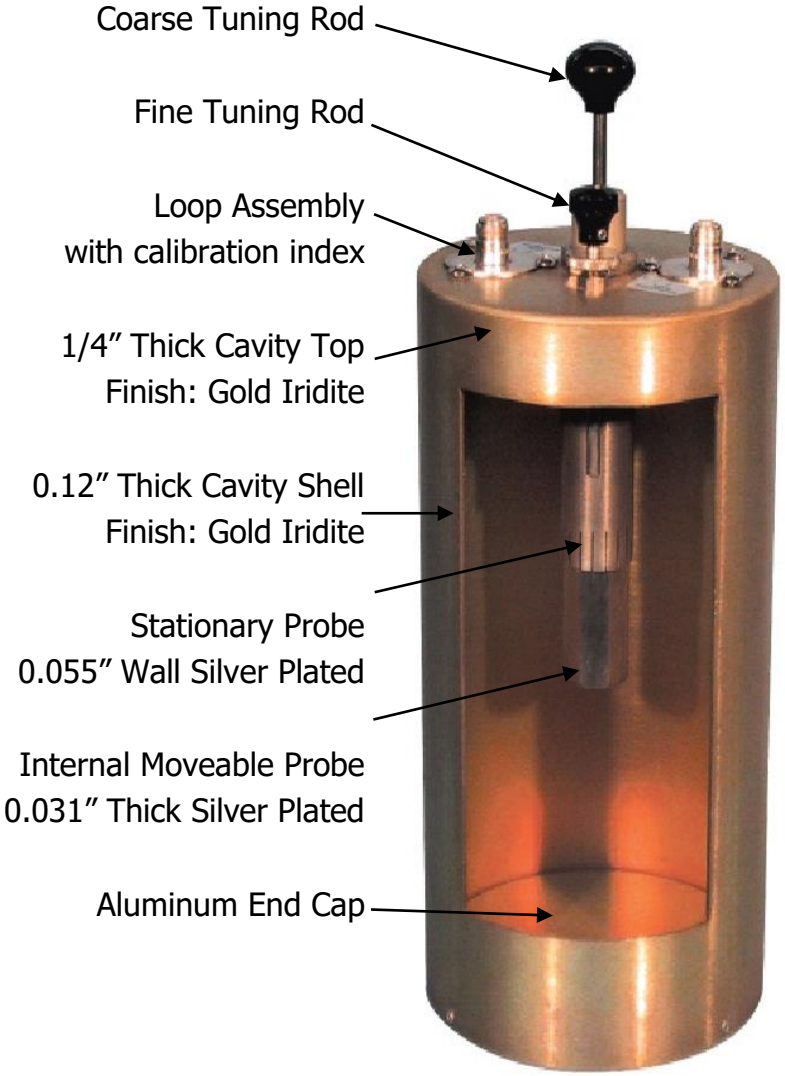
Bandpass Loop

Pass/Reject Loop

Notch Loop

X-Pass Loop

Cavity Construction
Mechanical Components



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CAVITY FILTER DESIGN

We at Comprod have one of the most rugged, high quality cavity filter designs in the industry with our proven, temperature-compensated cavities. The flexibility of having four versions of filters, (Bandpass, Notch, Pass-Reject, and X-Pass), available in 2", 4", 6.625" and 10" cavities, allows for any system to be designed for maximum performance and efficiency. All of the following filters can be achieved by changing the loops, while maintaining the same cavity, when using the 6.625" and 10" cavities.

1. **Bandpass Cavity Filter** – Passes one narrow band of frequencies and attenuates all others with increasing attenuation above and below the pass frequency. The adjustable selectivity characteristics using rotatable loops allows for a trade-off between insertion loss (0.5 to 3.0 dB) and selectivity. This filter is ideal when the interfering frequencies are not known with any degree of accuracy or when high amounts of broadband filtering are required.
2. **Notch Filter** – Passes a relatively wide band of required frequencies, while rejecting a very narrow band of undesired frequencies. Notch depth is variable from 15 to 25 dB. Both the pass and notch frequencies must be known. The Notch Filter is recommended when filtering multiple channel transmitters and receivers. This filter is ideal for very close separations (70-200 kHz) in VHF and (200-400 kHz) in UHF.
3. **Pass-Reject Filter** – Passes a relatively narrow band of required frequencies and rejects a specific undesired frequency. This filter has the greatest notch depth when compared to other types of filters. Notch depth is adjustable, but is dependent on the passband insertion loss (0.3 dB or 0.6 dB typical) and frequency separation. This type of filter is the most efficient for moderately close to wide separations of 200 kHz and greater in VHF and 400 kHz and greater in UHF.
4. **X-Pass** – A special type of filter for expandable multicoupler/combiner applications. Characteristics are identical to a bandpass filter, but have a third port for coupling to other channels. This filter is ideal for close frequency spacing with extremely low losses, acting similar to a hybrid combiner/multicoupler. The design is extremely flexible and expandable from 1 to 21 cavities per rack with additional channel capabilities.

All of our 6.625" and 10" filters have two hand-movable tuning rods (a coarse and a fine) for faster tuning. Silver-plated adjustable coupling loops and a calibration index label help to facilitate setting the cavity insertion loss as required for each application.

The combination of a heavy-gauge aluminum outer conductor, thick heliarc-welded cavity top plates, heavy silver-plating on micro-finished tuning assemblies, and Invar-based temperature compensation material results in constant performance levels and long-term reliability. Cavity and isolator connectors are type N female, with silver-plated brass bodies and gold-plated center contacts. Thru-line cable assemblies are made with high quality connectors and RG-393B/U Teflon or RG-214/U cable, to provide excellent intermodulation rejection at high system power levels. Gold-plated cable connector center contacts are soldered to the cable, and the dual shield is securely crimped to the connector barrel using pneumatic fixtures and precision dies. All of these attributes contribute to making a superior quality product.

For additional information on our X-Pass, Combiners, Multicouplers, Duplexers, Pass-Reject, Bandpass, or Notch filters, contact our Technical Support team at sales@comprodcom.com.

CAVITY FILTER DESIGN

FILTER NOMENCLATURE PP—FF—XX—YY

PP = Product Category/Family

FF = Frequency Band / Frequency Range

XX = Cavity Size/No. Channels/Load Size/Termination

YY = Mounting Style

PP—Product Category / Product Family Codes			
11	Mounting Kits	56	2nd Harmonic Filter
13	Cable Kits/Accessories	57	Combline Filters
19	X-Racks	58	Pre-Amp
21	Low Power Single Junction Isolator	59	Pre-Selector
22	Low Power Dual Junction Isolator	60	Multicoupler (XMF Version – Reject/Pass)
27	Economy Power Dividers	61	Bandpass Filter
29	Low Power Directional Couplers	62	Pass-Reject Filter
41	High Power Single Junction Isolator	63	Notch Filter
42	High Power Dual Junction Isolator	66	Pass-Reject, Helical & Re-Entrant Duplexer
45	RF Loads	68	X-Pass Filter
46	Signal Sampler	69	Paging Filter
47	Power Divider	90	RX Multicoupler
48	Hybrid Decouplers VHF/UHF/800/900MHz	DRC	Dielectric Resonator Star Configuration
49	Hybrid Coupler (Single Band)	DRXC	Dielectric Resonator X-Pass Configuration
50	Compact Hybrid Coupler	HTC	Hybrid Transmit Combiner
51	Band pass Conversion Loops	TTA	Tower Top Amplifier
52	Pass-Reject Conversion Loops	XBC	X-Band Coupler (Cross Band Couplers)
53	Notch Conversion Loops	XRM	Expandable Receiver Multicoupler
54	X-Pass Conversion Loops	XTC	Expandable Transmit Combiner System
55	Variable Attenuator 3-15 dB	XTR	Expandable Transmit Receiver System

Model	Filter Type	Other Frequency (MHz)	118-136 MHz	138-174 MHz	406-512 MHz	746-960 MHz	Cavity / Mounting	Power Watts	Connector
61-FF-7X	Bandpass		●	●	●	●	6.625	150	N Female
62-FF-7X	Pass-Reject	30-88	●	●	●	●	6.625	150	N Female
63-FF-7X	Notch		●	●	●	●	6.625	150	N Female
60-13-7X	XMF Multicoupler			●			6.625	90-400	N Female
60-40-7X	XMF Multicoupler				●		6.625	80-300	N Female
66-FF-74	Duplexer			●	●		6.625	350	N Female
66-FF-2P	Duplexer			●			2 x 2	100	BNC / N F
66-FF-44	Duplexer			●	●	●	4 x 4	350	N Female
66-FF-46	Duplexer			●	●	●	4 x 4	350	N Female
5X4-90	Mobile Duplexer			144-174	406-470		1 x 1	50	BNC / N F
5X6-90	Mobile Duplexer			144-174	406-470		1 x 1	50	BNC / N F
68-FF-7X	X-Pass		●	●	●	●	6.625	150	N Female
XTC-06-7X	X-Pass						6.625	150	N Female
XTC-06-0X	X-Pass						10	150	N Female
XTC-11-7X	X-Pass		108-136				6.625	150	N Female
XTC-11-0X	X-Pass		108-136				10	150	N Female
XTC-13-7X	X-Pass			132-174			6.625	150	N Female
XTC-13-0X	X-Pass			132-174			10	150	N Female
XTC-22-7X	X-Pass	215-300					6.625	150	N Female
XTC-22-0X	X-Pass	215-300					10	150	N Female
XTC-38-7X	X-Pass				380-512		6.625	150	N Female
XTC-38-0X	X-Pass				380-512		10	150	N Female
XTC-74-7X	X-Pass					●	6.625	150	N Female
XTC-74-0X	X-Pass					●	10	150	N Female
80-FF-8X	X-Pass Combiner				●	●	19" Rack Mt	60/100	N Female
XRM-13-PP	RX Multicoupler	138-225		●			Rack/Cavity	RX	BNC / N F
XRM-38-PP	RX Multicoupler				300-512		Rack/Cavity	RX	BNC / N F
XRM-80-PP	RX Multicoupler					806-896	Rack/Cavity	RX	BNC / N F
XRM-90-PP	RX Multicoupler					896-960	Rack/Cavity	RX	BNC / N F
90-FF-PP	RX Multicoupler				●	●	19" Rack Mt	RX	N Female

Model	Filter Type	Other Frequency (MHz)	118-136 MHz	138-174 MHz	406-512 MHz	746-960 MHz	Cavity / Mounting	Power Watts	Connector
TTA-FF-00	TTA Amplifier			•	•	•	N/A	RX	N Female
21-FF-PP	Single Isolators			•	•	•	N/A	RX	N Female
22-FF-PP	Dual Isolators			•	•	•	N/A	100	N Female
41-FF-PP	Single Isolators			•	•	•	N/A	150-250	N Female
42-FF-PP	Dual Isolators			•	•	•	N/A	150-250	N Female
45-05-PP	RF Loads	5-1000	•	•	•	•	N/A	5-250	N Male
HTC-13 Combiner	Hybrid Combiner			•			19" Rack Mt	100	N Female
HTC-40 Combiner	Hybrid Combiner				•		19" Rack Mt	100	N Female
HTC-80 Combiner	Hybrid Combiner					806-960	19" Rack Mt	100	N Female
49, 50-FF-YY-XX	Hybrid Coupler			•	•	•	N/A	N/A	N Female
Ceramic Combiner	Star Junction Combiner					•	19" Rack Mt	125	N Female
Ceramic Combiner	X-Pass Combiner					•	19" Rack Mt	125	N Female
XBC-FF-PP	Crossband Coupler	25-175	•	•	•	•	N/A	RX-250	N Female
57-FF-XX	Comblines				•	•	N/A	RX	N Female
46-FF-30-50	Signal Samplers			•	•	•	N/A	50	N Female
47-FF-XXN	Power Splitters	25-512	•	•	•	•	N/A	RX	N Female
56-FF-01	Harmonic Filters		•	•	•	•	N/A	150	N Female
66-13-3X-HE	Helical Duplexer			•			19" Rack Mt	150	N Female
66-FF-XX-RE	Re-Entrant Duplexer			•	•		19" Rack Mt	350	N Female
Racks, Hardware	Filter Racks						Racks	N/A	N/A

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BAND PASS CAVITY 108-960 MHz

61-FF-7X Series

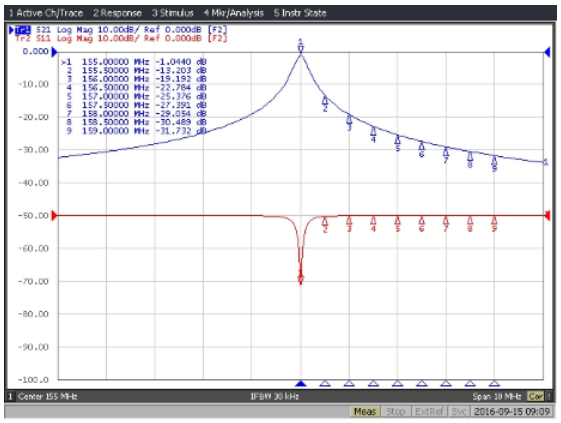
Our Band Pass filters are designed for minimizing interference from adjacent channels and outside systems. They are available in single units. Selectivity can be determined by the insertion loss of the cavity or by adding additional cavity units as needed. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops and silver-plated tuning rods. Every cavity is equipped with coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

Electrical Specifications	61-11-71	61-14-71	61-38-71	61-76-71
Frequency Range, MHz (in splits)	108-136	138-174	380-512	764-960
Frequency Spacing Min.	Please Refer to Typical Curves			
Cavity Diameter, in	6.625	6.625	6.625	6.625
Continuous Power Input, Watts (Dependent on insertion Loss)	150	150	150	150
Connectors	N Female			
Insertion Loss. dB	0.6-1.5			
Reject Attenuation	Please Refer to Typical Curves			
VSWR	1.22:1	1.22:1	1.22:1	1.22:1
Temperature ºC	-40 to 60-40 to +60			

Mechanical Specifications	61-11-71	61-14-71	61-38-71	61-76-71
Maximum length, in	40	35	20.5	20.7
Weight, lbs	18	15	10	10

* See appendix for ordering information (Page 236)



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PASS-REJECT CAVITY 108-960 MHz

62-FF-7X Series

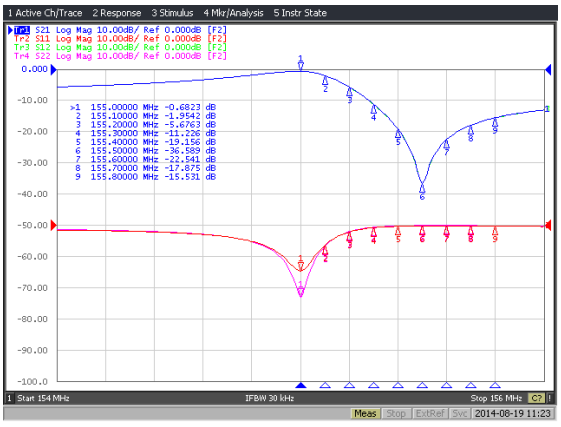
Our Pass-Reject filters are designed to pass a frequency band and reject a narrow band of frequencies. They provide more attenuation than our standard bandpass type cavities. These cavities can reject frequencies on either the high or low side of the pass frequency. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

Electrical Specifications	62-11-71	62-14-71	62-38-71	62-76-71
Frequency Range, MHz (in splits)	108-136	138-174	380-512	764-960
Frequency Spacing Min.	Please Refer to Typical Curves			
Cavity Diameter, in	6.625	6.625	6.625	6.625
Continuous Power Input, Watts (Dependent on insertion Loss)	300	300	300	150
Connectors	N Female			
Insertion Loss. dB	0.6-1.5			
Reject Attenuation	Please Refer to Typical Curves			
VSWR	1.22:1	1.22:1	1.22:1	1.22:1
Temperature ºC	-40 to +60			

Mechanical Specifications	62-11-71	62-14-71	62-38-71	62-76-71
Maximum length, in	40	35	20.5	20.7
Weight, lbs	18	15	10	10

* See appendix for ordering information (Page 237)



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NOTCH CAVITY 108-960 MHz

63-FF-7X Series

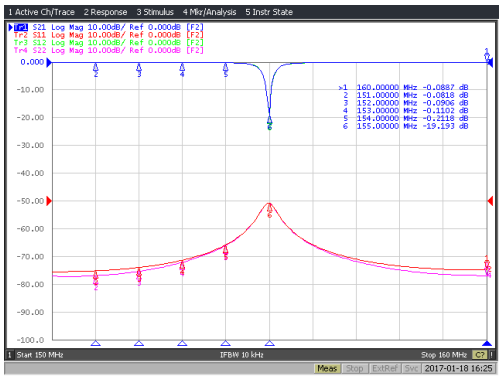
Our Notch filters are designed to reject one narrow band of frequencies, while letting all others pass in the operating band. They provide additional isolation by eliminating close adjacent frequencies. The notch cavities can be cascaded or added to one another in order to sharpen the attenuation of the rejection curve. These cavities can be used individually or in multiples. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

Electrical Specifications	63-11-71	63-14-71	63-38-71	63-76-71
Frequency Range, MHz (in splits)	108-136	138-174	380-512	764-960
Frequency Spacing Min.	Please Refer to Typical Curves			
Cavity Diameter, in	6.625	6.625	6.625	6.625
Continuous Power Input, Watts (Dependent on insertion Loss)	150	150	150	150
Connectors	N Female			
Insertion Loss. dB	0.6-1.5			
Reject Attenuation	Please Refer to Typical Curves			
VSWR	1.22:1	1.22:1	1.22:1	1.22:1
Temperature ºC	-40 to +60			

Mechanical Specifications	63-11-71	63-14-71	63-38-71	63-76-71
Maximum length, in	40	35	20.5	20.7
Weight, lbs	18	15	10	10

* See appendix for ordering information (Page 237)



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XMF MULTICOUPLERS

VHF, UHF, & 700/800/900 MHz, Expandable, Bandpass, Multicoupler Filters

The XMF (Expandable, Bandpass, Multicoupler, Filter) system is a unique transmit/receive multi-coupler. Each channel consists of one, two, or three bandpass filters in combination with an exclusive notch filter design. This enables system expansion without modification to the existing system channels as long as applicable selectivity standards for minimum channel spacing are met.

This unique notch-filter approach provides a junction between channels, allowing channel frequencies to pass freely to or from antennas, while diverting all other channel frequencies to the pass-through antenna line terminal. This characteristic is field-tunable over specified bands of operation without any alterations in the configuration.

Channels may be interconnected with any convenient cable length. There is also no frequency order of interconnection required. The only requirement is that the minimum spacing for VHF is 0.8 MHz and for UHF is 2 MHz.

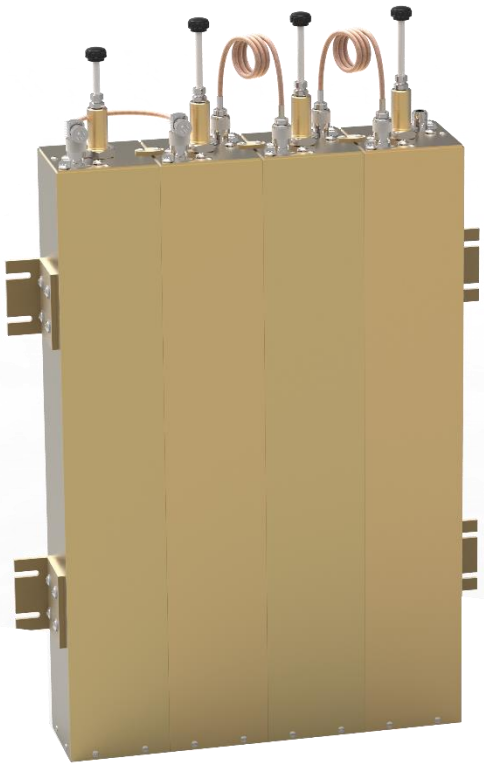
Our XMF channels are supplied with mounting hardware for wall or rack mounting. The individual cavities are mounted with stainless steel strap clamps, and two horizontal mounting bars. In either case, it may be located at a convenient location for rack or wall applications. Horizontally-spaced mounting holes are the standard 19" EIA rack spacing for on the wall and rack mounting.

XMF BAND PASS MULTICOUPLER VHF 138-174 MHz

VHF 60-FF-XP Series 4"x 4"

Our Bandpass VHF Multicoupler filters are designed for minimizing interference from adjacent channels and outside systems. They are available in single, dual, triple or additional units. Selectivity can be determined by the insertion loss of the cavity or by adding cavity units as required. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss



Electrical Specifications	60-FF-43
Frequency Range, MHz (in splits)	138-174
Frequency Spacing Min. MHz	2
Cavity Dimensions, in (W x L)	4 x 4
Continuous Power Input, Watts	150
Connectors	N Female
Insertion Loss, dB	3.4
Channel Isolation, dB	See Typical Curves
VSWR	1.5:1
Temperature ºC	-40 to +60

Mechanical Specifications	60-FF-43
Maximum length, in (H x W x D)	34 x 19 x 4
Weight, lbs (kg)	27 (12)

* See appendix for ordering information (Page 237)

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XMF BAND PASS MULTICOUPLER VHF 138-174 MHz

VHF 60-FF-XP Series 7”

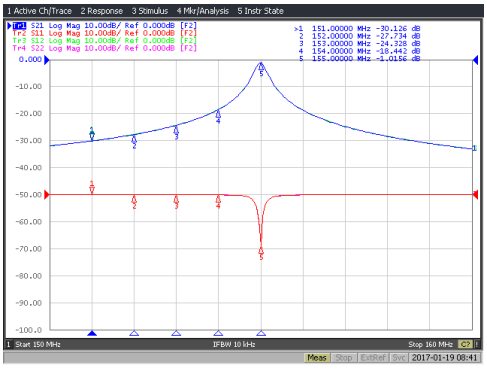
Our Bandpass VHF Multicoupler filters are designed for minimizing interference from adjacent channels and outside systems. They are available in single, dual, triple or additional units. Selectivity can be determined by the insertion loss of the cavity or by adding cavity units as required. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

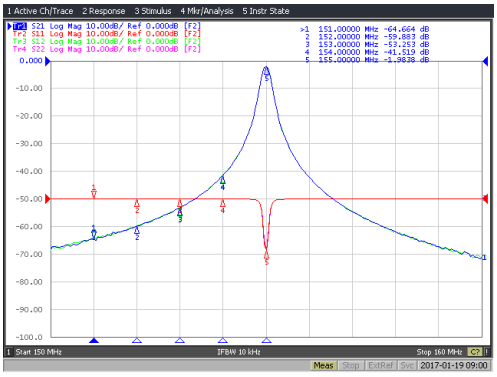
Electrical Specifications	60-13-71	60-FF-72	60-FF-73
Frequency Range, MHz (in splits)	138-174	138-174	138-174
Frequency Spacing Min. MHz	0.8	0.8	0.8
Cavity Diameter, in	6.625	6.625	6.625
Continuous Power Input, Watts	90-400	90-400	90-400
Connectors	N Female		
Insertion Loss, dB	0.6-1.5	1.2-3.2	1.8-5.0
Channel Isolation, dB	See Typical Curves		
VSWR	1.5:1	1.5:1	1.5:1
Temperature ºC	-40 to +60		

Mechanical Specifications	60-14-71	60-FF-72	60-FF-73
Maximum length, in (H x W x D)	34 x 19 x 7	34 x 19 x 16.5	34 x 19 x 16.5
Weight, lbs (kg)	30 (13.6)	36.3 (16.5)	44 (20)

* See appendix for ordering information (Page 238)



60-14-71



60-13-72

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XMF BAND PASS MULTICOUPLER UHF 380-512 MHz

UHF 60-FF-XP Series 4"x 4"

Our Bandpass, UHF, Multicoupler, filters are designed for minimizing interference from adjacent channels and outside systems. They are available in single, dual, triple or additional units. Selectivity can be determined by the insertion loss of the cavity or by adding cavity units as needed. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning applications.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

Electrical Specifications	60-FF-43
Frequency Range, MHz (in splits)	380-512
Frequency Spacing Min. MHz	2
Cavity Dimensions, in (W x L)	4 x 4
Continuous Power Input, Watts	150
Connectors	N Female
Insertion Loss, dB	3.4
Channel Isolation, dB	See Typical Curves
VSWR	1.5:1
Temperature ºC	-40 to +60

Mechanical Specifications	60-FF-43
Maximum length, in (H x W x D)	18.5 x 19 x 4
Weight, lbs (kg)	13 (5.9)

* See appendix for ordering information (Page 238)

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XMF BAND PASS MULTICOUPLER UHF 380-512 MHz

UHF 60-FF-XP Series 7”

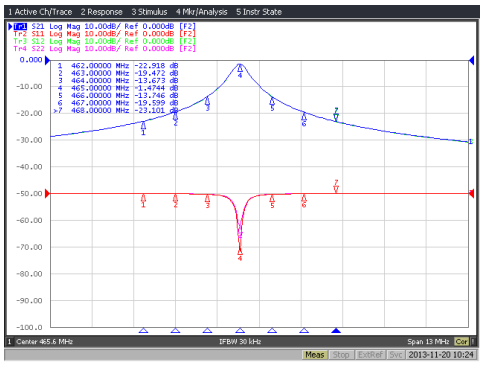
Our Bandpass, UHF, Multicoupler, filters are designed for minimizing interference from adjacent channels and outside systems. They are available in single, dual, triple or additional units. Selectivity can be determined by the insertion loss of the cavity or by adding cavity units as needed. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning applications.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

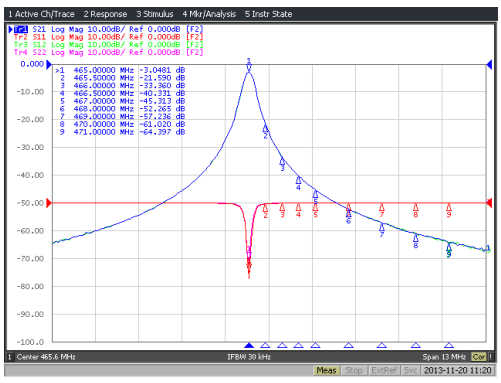
Electrical Specifications	60-38-71	60-FF-72	60-FF-73
Frequency Range, MHz (in splits)	380-512	380-512	380-512
Frequency Spacing Min. MHz	0.8	0.8	0.8
Cavity Diameter, in	6.625	6.625	6.625
Continuous Power Input, Watts	80-300	80-300	80-300
Connectors	N Female		
Insertion Loss, dB	0.6-1.5	1.2-3.0	1.8-5.0
Channel Isolation, dB	See Typical Curves		
VSWR	1.5:1	1.5:1	1.5:1
Temperature ºC	-40 to +60		

Mechanical Specifications	60-38-71	60-FF-72	60-FF-73
Maximum length, in (H x W x D)	16 x 19 x 7	16 x 19 x 16.5	16 x 19 x 16.5
Weight, lbs (kg)	18 (8.6)	26 (11.8)	32 (15.2)

* See appendix for ordering information (Page 238)



60-40-71



60-40-72

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PASS-REJECT DUPLEXER 138-512 MHz

66-FF-74 and 66-FF-76

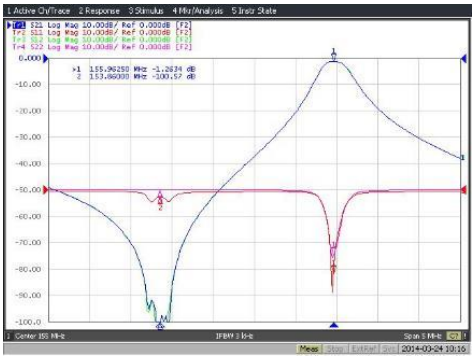
Our Pass-Reject Duplexer filters are designed for quick and easy installations. These filters are designed for the combination of two frequencies requiring extra isolation or can be used as efficient pre- selectors. They are available in either 4 or 6 cavity configurations if higher levels of isolation are required. Selectivity can be determined by the field adjustable capacitors. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

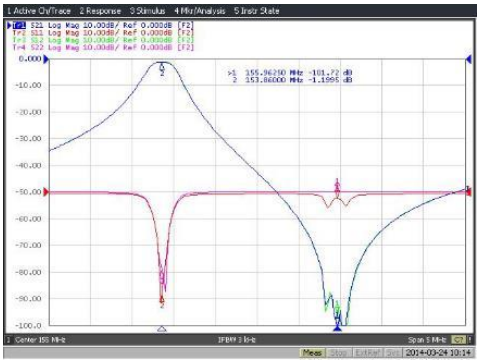
Electrical Specifications	66-FF-74	66-FF-76	66-FF-74
Frequency Range, MHz	138-174	138-174	380-512
Frequency Spacing Min. MHz	0.5	0.3	1.5
Cavity Diameter, in	6.625	6.625	6.625
Continuous Power Input, Watts	400	400	350
Connectors	N Female		
Insertion Loss, dB	1.5	2.2	1.5
Channel Isolation, dB	85	95	90
VSWR	1.22:1	1.22:1	1.22:1
Temperature ºC	-40 to +60		

Mechanical Specifications	66-FF-74	66-FF-76	66-FF-74
Maximum length, in (H x W x D)	34 x 19 x 16.5	34 x 19 x 24	18.5 x 19 x 16.5
Weight, lbs (kg)	44 (20)	90 (40)	32 (15.2)

* See appendix for ordering information (Page 238)



66-13-74



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2-INCH CAVITY PASS-REJECT DUPLEXERS 138-174 MHz

66-FF-2P Series 2" Cavity Pass-Reject Duplexers

Our 2" base station duplexers are ideal for compact high isolation installations. These filters are designed for the combination of two frequencies that require extra isolation, or they can be used as efficient preselectors. Available in either 4 or 6 cavity configurations if higher levels of isolation are required. Selectivity can be determined by the field adjustable capacitors. Each cavity is temperature compensated for operation between -40ºC to +60 ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems

Electrical Specifications	66-13-24	66-14-24	66-13-26	66-14-26
Frequency Range, MHz	138-150	148-174	138-150	148-174
Frequency Spacing Min.	4.5	4.5	3.0	3.0
Cavity Number	4	4	6	6
Cavity Diameter, in	2.0	2.0	2.0	2.0
Continuous Power Inputs, Watts	100	100	100	100
Connectors (Equipment/Antenna)	BNC/N-F			
Insertion Loss, dB (maximum)	1.5	1.5	1.5	1.5
Channel Isolation, dB	70	70	80/90	80/90
VSWR	1.3:1		1.3:1	
Temperature ºC	-40 to +60			

Mechanical Specifications	66-13-24	66-14-24	66-13-26	66-14-26
Maximum length, in (H x W x D)	5.25 x 19 x 7.25		5.25 x 19 x 7.25	
Mounting	19" Rack Mount			

These duplexers are available in other frequencies and configurations. Please call our technical support for additional models.

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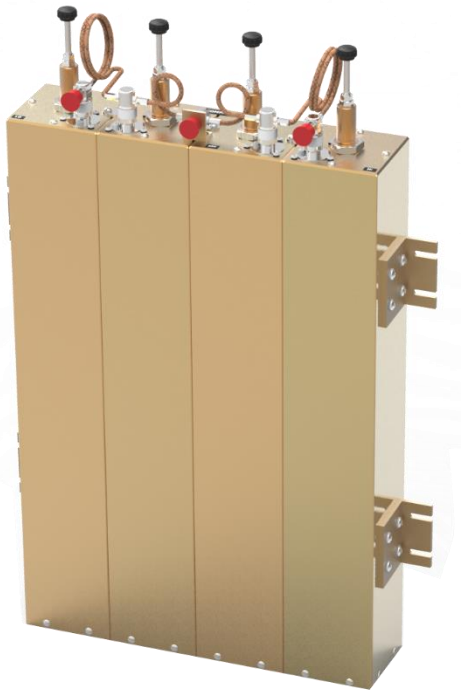
4-INCH CAVITY PASS-REJECT DUPLEXERS 138-960 MHz

66-FF-44 Series (4) 4" Cavity Duplexers

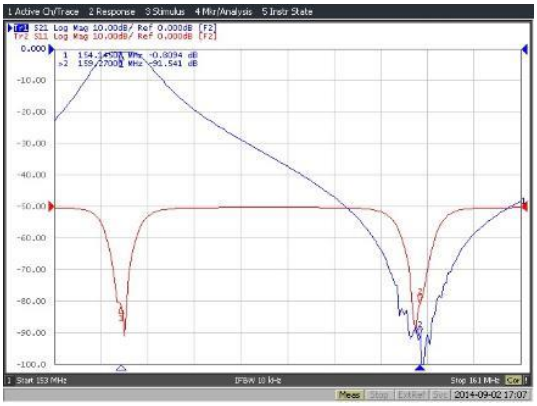
These 4” base station duplexers are ideal for high power, close frequency separation installations. These filters are designed for combining two frequencies or they can be used as efficient pre-selectors. If higher levels of isolation are required, please consider using 6 cavity configurations. Selectivity can be determined by the field adjustable capacitors. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems

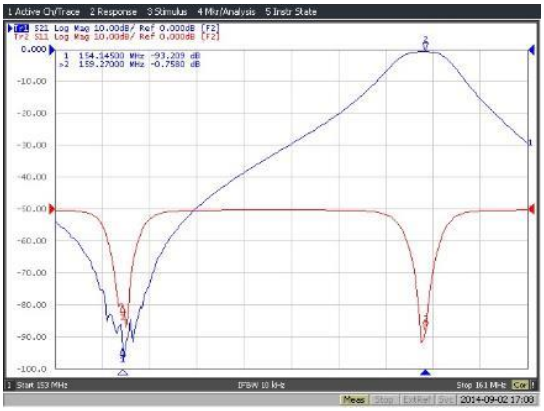
Electrical Specifications	66-13-44	66-FF-44	66-FF-44
Frequency Range, MHz	138-174	380-512	746-960
Frequency Spacing Min. MHz	0.5	3	9
Cavities, Diameter, in	(4) - 4" Square	(4) - 4" Square	(4) - 4" Square
Continuous Power Input, Watts	350	350	350
Connectors	N Female		
Insertion Loss, dB (maximum)	1.5	0.8	0.8
Channel Isolation, dB	70	75	90
VSWR	1.2:1	1.2:1	1.2:1
Temperature ºC	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**66-13-44**	**66-FF-44**	**66-FF-44**
Maximum length, in (H x W x D)	31 x 19 x 4	4 x 19 x 15	4 x 19 x 12
Weight, lbs (kg)	30 (13.6)	18 (8.2)	16 (7.3)
Mounting	19" Rack Mount		



* See appendix for ordering information (Page 239)



66-13-44 (VHF)



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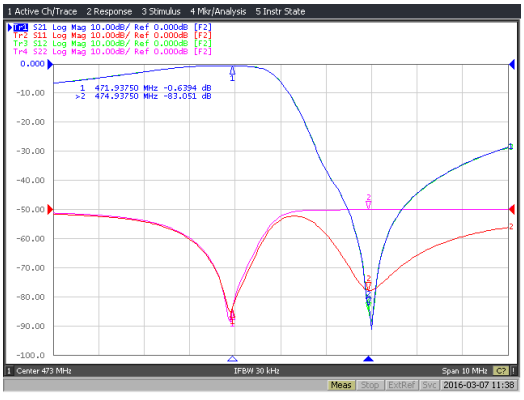
66-FF-46 Series (6) 4" Cavity Duplexers

These 6-cavity 4" base station duplexers are ideal for high power close frequency separation installations. These filters are designed for the combination of 2 frequencies that require extra isolation or they can be used as an efficient pre-selector. If higher levels of isolation are required, please consider using the 8-cavity configuration. Selectivity can be determined by the field adjustable loops. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods.

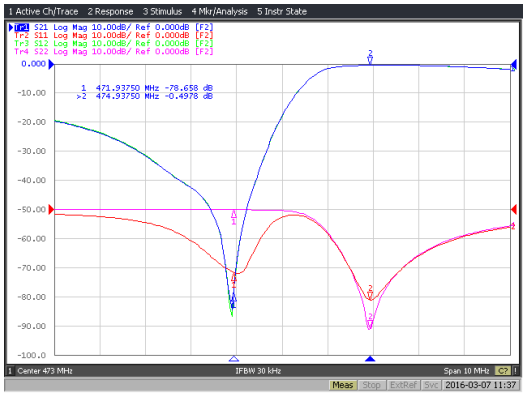
- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems

Electrical Specifications	66-13-46	66-FF-46	66-FF-46
Frequency Range, MHz	138-174	380-512	746-960
Frequency Spacing Min. MHz	0.5	3.0	3.6
Cavities, Diameter, in	(6) - 4" Square	(6) - 4" Square	(6) - 4" Square
Continuous Power Input, Watts	350	350	350
Connectors	N Female		
Insertion Loss, dB (maximum)	2.1	1.2	1.2
Channel Isolation, dB	85	100	85
VSWR	1.2:1	1.2:1	1.2:1
Temperature ºC	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**66-13-46**	**66-FF-46**	**66-FF-46**
Maximum length, in (H x W x D)	31 x 19 x 8	8 x 19 x 15	8 x 19 x 12
Weight, lbs (kg)	45 (20.25)	27 (12.15)	24 (10.8)
Mounting	19" Rack Mount		

* See appendix for ordering information (Page 239)



66-40-46 (UHF)



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4-CAVITY MOBILE DUPLEXERS 144-470 MHz

4 Cavity Standard Version

Our line of mobile duplexers features compact size, low loss and temperature compensation over the range of -40ºC to +60ºC. The use of extruded aluminum cavities and solid- shield copper-jacketed inter-cabling ensures excellent mechanical and electrical stability.

All units are adjustable in the field by qualified personnel and rated at a maximum of 50 Watts with a maximum VSWR of 1.5:1 over the entire tuning range.

BNC connectors are standard. Variations on connectors and mountings are available by special order. For N female connectors, add suffix N to model number (Ex. 534-90-N).

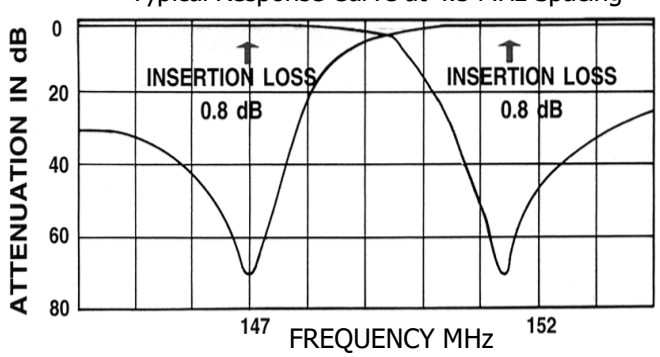
Electrical Specifications	534-90	504-90	
Frequency Range, MHz (in splits)	144-174	406-470	
Frequency Spacing Min. MHz	4.5	5.0	10.0
Continuous Power Rating, Watts	50	50	50
Insertion Loss, dB: TX to Antenna	0.8	1.2	0.8
Insertion Loss, dB: RX to Antenna	0.8	1.2	0.8
Isolation, dB: TX noise suppression at RX frequency	60	50	60
Isolation, dB: TX isolation at TX frequency	60	50	60
Maximum VSWR	1.5:1	1.5:1	
Impedance, Ohms	50	50	
Connector Type, Female	BNC / N-F		
Temperature ºC	-40 to +60		

Mechanical Specifications	534-90	504-90
Dimensions H x W x D, in. (mm)	1-1/4 x 4-1/8 x 7-5/8 (31.8 x 105 x 194)	1-1/4 x 4-1/8 x 8-3/4 (31.8 x 105 x 222)
Weight, lbs (kg)	1.5 (0.7)	2 (0.9)

* See appendix for ordering information (Page 239)

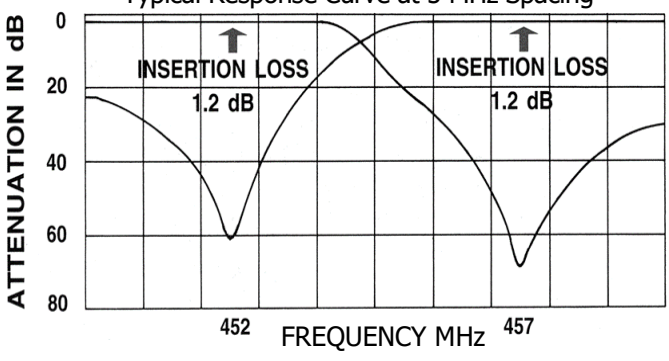
534-90

Typical Response Curve at 4.5 MHz Spacing



504-90

Typical Response Curve at 5 MHz Spacing



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6-CAVITY MOBILE DUPLEXERS 144-512 MHz

6 Cavity Standard Version

Our line of mobile duplexers features compact size, low loss and temperature compensation over the range of -40ºC to +60ºC. The use of extruded aluminum cavities and solid-shield copper-jacketed inter-cabling ensures excellent mechanical and electrical stability.

All units are adjustable in the field by qualified personnel and rated at 50 watts continuous duty with a maximum VSWR of 1.5: 1 over the entire tuning range.

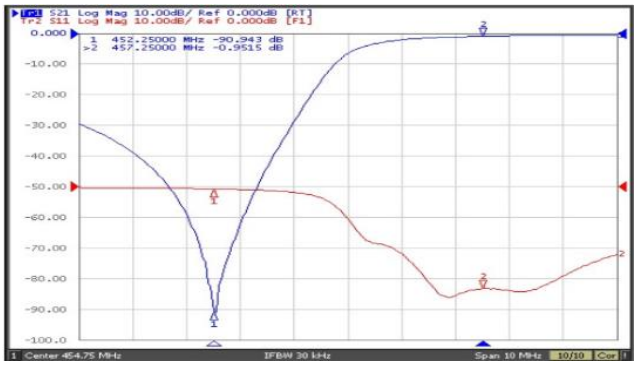
BNC connectors are standard. Variations on connectors and mountings are available by special order. For N female connectors, add suffix N to model number (Ex. 536-90-N)

Electrical Specifications	536-90	506-90	
Frequency Range, MHz (in splits)	144-174	406-512	
Frequency Spacing Min. MHz	4.5	5.0	10.0
Continuous Power Rating, Watts	50	50	50
Insertion Loss, dB: TX to Antenna	1.2	1.4	1.2
Insertion Loss, dB: RX to Antenna	1.2	1.4	1.2
Isolation, dB: TX noise suppression at RX frequency	80	75	80
Isolation, dB: TX isolation at TX frequency	80	75	80
Maximum VSWR	1.5:1	1.5:1	
Impedance, Ohms	50	50	
Connector Type, Female	BNC / N-F		
Temperature ºC	-40 to +60		

Mechanical Specifications	536-90	506-90
Dimensions H x W x D, in. (mm)	1-1/4 x 6-3/16 x 7-5/8 (31.8 x 157 x 222)	1-1/4 x 6-3/16 x 7-5/8 (31.8 x 157 x 222)
Weight, lbs (kg)	2 (0.9)	3.5 (1.7)

* See appendix for ordering information (Page 239)

506-90 Typical Response Curves at 5 MHz Spacing



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BASE STATION DUPLEXERS 138-174 & 406-512 MHz

VHF and UHF Re-Entrant Base Station Duplexers

These Comprod base station duplexers use four or six cavities. They are ideal for compact high-performance applications. They are designed to cover either the VHF frequency band. These filters are designed for the combination of two frequencies that require extra isolation, or they can be used as an efficient preselector. An eight-cavity configuration is also available for a higher level of isolation and selectivity.

- N Female connectors on the input and output
- Can be retuned in the field
- These duplexers are available in other frequencies and configurations. Please call our technical support for additional models.

Electrical Specifications	66-13-44-RE	66-40-34-RE
Frequency Range, MHz	138-174	406-512
Frequency Spacing, MHz	2	5
Continuous Power Inputs, Watts	350	350
Connectors	N Female	
Number of Cavities	4	4
Insertion Loss, dB	1.5	0.8
Isolation at minimum spacing	70	75
VSWR	1.22:1	1.22:1
Temperature ºC	-40 to +60	
Mechanical Specifications	**66-13-44-RE**	**66-40-34-RE**
Cavity Size, in (H x W x D)	4 x 4 x 10	4 x 3 x 6
Maximum length, in (H x W x D)	5.2 x 19 x 14 (3 Rack Units)	5.2 x 19 x 12 (3 Rack Units)
Mounting	19-inch rack mount	19-inch rack mount

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X-PASS

Expandable Multicoupler/Combiner Filters

The X-Pass system is a proven innovative family of filter design technology. Possessing the properties of a combiner, but having the expandability of a multicoupler, our X-Pass filters are one of the most versatile and re-usable filtering systems available on the market.

The X-Pass Transmitter Combiner Receiver Multicoupler has superior expandability compared with the fixed star junction configuration. The X-Pass system can be expanded one channel at a time for up to 21 channels with factory tuned, easy to install expansion channel assemblies. Expansion can be completed easily, without modifying the existing system, as easy as adding one or more channels on top of the existing system (daisy chain).

The X-Pass system is a broadband design allowing the system to span entire frequency ranges by using the properties of the X-Pass combiner for close frequency spacing and the X-Pass multicoupler properties for normally spaced channels. The X-Pass system can span the full 138-174 MHz, 406-512 MHz or 806-960 MHz frequency bands. When using the 6.625" cavities, the TX-TX separation in VHF can be as close as 75 kHz of frequency separation, or 50 kHz of separation when using 10" cavities.

The X-Pass system has the advantage of being extremely flexible to configure. With the ability to combine Bandpass, Pass-Reject, or Notch loops for 6.625" and 10" cavity filters, once-difficult complex operating requirements can be resolved with a customized design. This allows the X-Pass system to have unlimited combinations that can be integrated using multi-cavity configurations while retaining the expandability of the combiner properties for close frequency-spaced channels using 6.625" and 10" cavities. The system can also be a combination of a combiner for close frequency-spaced channels while encompassing the expandability of a standard multicoupler that can be integrated with standard Bandpass, Notch, and Pass-Reject filter combinations. All of our X-Pass systems come fully assembled, tested and ready for Plug-and-Play installations.

The X-Pass system has one extra beneficial aspect - the optional X-Pass Rack. With this unique rack design, certain systems can take up to 50 % less space than other systems that are in a 19" rack. By being able to mount all of the cavities horizontally, the installer has the ability to expand one channel on top of another in no particular order, and not having the physical obstacles of mounting a star-junction type configuration in a rack. The X-Pass system can save valuable installation space and make efficient use of the rack space for future expansion projects.

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X-PASS CAVITY 108-960 MHz

68-FF-7X Series

Our X-Pass filters are designed for flexible, close frequency systems. Each cavity has both a Reject and a Pass band curve. These individual cavities are used to add channels to existing systems. Available in single units, they can be combined with Bandpass, Notch, and Pass-Reject cavities for added protection and isolation. Selectivity can be determined by the insertion loss of the cavity or by adding Bandpass cavity units to this expansion channel as required. Each cavity is temperature compensated for operation between -40ºC to +60ºC. Each cavity has a gold Alodine finish, silver-plated loops, and silver-plated tuning rods. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems
- Adjustable Loops
  - Each cavity has a calibration index to reference insertion loss

Electrical Specifications	68-11-71	68-13-71	68-38-71	68-74-71
Frequency Range, MHz	108-136	132-174	380-512	746-960
Frequency Spacing Min.	Please Refer to Typical Curves			
Cavity Diameter, in	6.625	6.625	6.625	6.625
Continuous Power Input, Watts (Dependent on insertion Loss)	300	300	300	150
Connectors	N Female			
Insertion Loss. dB	0.6-1.5			
Reject Attenuation	Please Refer to Typical Curves			
VSWR	1.22:1	1.22:1	1.22:1	1.22:1
Temperature ºC	-40 to +60			

Mechanical Specifications	68-11-71	68-13-71	68-38-71	68-74-71
Maximum length, in	31.5	26	11.5	13
Weight, lbs	18	15	10	10

* See appendix for ordering information (Page 240)

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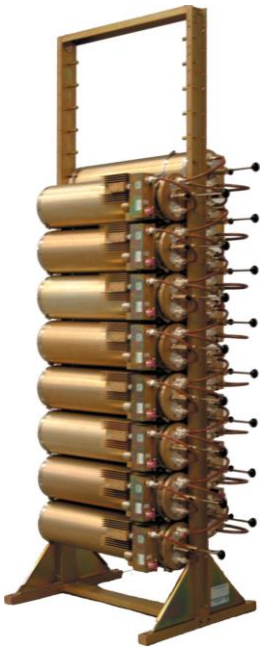
EXPANDABLE TRANSMIT COMBINER 108-1000 MHz

XTC-Expandable Transmit Combiner Series—7" Cavity



Our Expandable Transmit Combiners can combine from 1 to 21 channels. The XTC series of filters incorporates expandability, close frequency spacing and some of the lowest insertion losses in the industry. Using a 6.625" cavity, the XTC can easily support 75 kHz TX-TX spacing or 50 kHz spacing when using 10" cavities. Each cavity is constructed using a gold Alodine finish, silver-plated loops, silver-plated connectors and an internal tuning plunger. Additionally, cavities are temperature compensated for operation between -40ºC to +60ºC. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.

- Flexible and expandable design, From 1-21 channel capacity
- Expandable: 1 or more additional channels at a time, Re-configurable equipment
- 28 MHz to 254 MHz of operating bandwidth
- Temperature compensation, Ensures frequency stability
- High attenuation, Minimizes desense and interference
- Ultra-low insertion losses, Low coupling and bridging losses
- Continuous high-power handling capability, 150 watts – 24/7

Electrical Specifications	XTC-11-7ND	XTC-13-7ND	XTC-22-7ND	XTC-38-7ND	XTC-76-7ND
Frequency Range, MHz	108-136	132-174	215-300	380-512	746-1000
Bandwidth, MHz	28	42	85	85	254
Number of Channels	2 to 12	2 to 12	2 to 12	2 to 12	2 to 12
Cavity Diameter, in	6.625	6.625	6.625	6.625	6.625
Min. Channel Sep., kHz	75	75	100	125	250
Isolation Min., TX-TX, dB	70	70	70	80	80
Isolation Min., Ant-TX, dB	60	60	60	70	70
Max. Insertion Loss Per Chan., dB	3.6 to 5.6	4.3 to 6.7	4.1 to 5.8	4.1 to 6.4	3.1 to 5.5
Continuous Power Input, Watts	150	150	150	150	150
Connectors	N Female				
VSWR	1.22:1	1.22:1	1.22:1	1.22:1	1.22:1
Temperature, ºC	-40 to +60				
Mechanical Specifications					
Height, in (H x W X D) (mm)	86.5 x 24 x 40.25 (2197 x 610 x 1022) (In X Rack)				
Weight, lbs	DEPENDS ON SET-UP AND RACK DESIGN				
Mounting	19-inch rack mount				

* See appendix for ordering information (Page 240)

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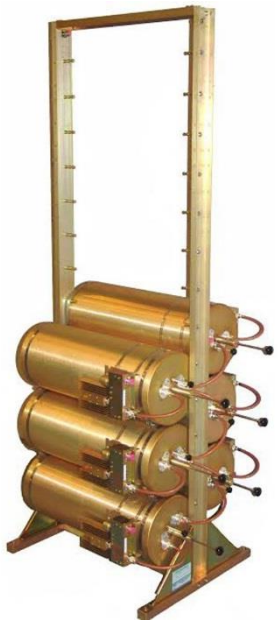
EXPANDABLE TRANSMIT COMBINER 108-512 MHz

XTC-Expandable Transmit Combiner Series—10" Cavity

Our Expandable Transmit combiners can combine from 1 to 21 channels. The XTC series of filters incorporates expandability, close frequency spacing and some of the lowest insertion losses in the industry. Using a 6.625" cavity, the XTC can easily support 75 kHz TX-TX spacing or 50 kHz spacing while using 10" cavities. Each cavity is constructed using a gold Alodine finish, silver-plated loops, silver-plated connectors and internal tuning plunger. Additionally, cavities are temperature compensated for operation between -40ºC to +60ºC. Every cavity is equipped with both coarse and fine-tuning rods for quick and easy field or lab re-tuning.



- Flexible and expandable design, From 1-21 channel capacity
- Expandable: 1 or more additional channels at a time, Re-configurable equipment
- 28 MHz to 132 MHz of operating bandwidth
- Temperature compensation, Ensures frequency stability
- High attenuation, Minimizes desense and interference
- Ultra-low insertion losses, Low coupling and bridging losses
- Continuous high-power handling capability, 150 watts – 24/7

Electrical Specifications	XTC-11-0ND	XTC-13-0ND	XTC-22-0ND	XTC-38-0ND
Frequency Range, MHz	108-136	132-174	215-300	380-512
Bandwidth, MHz	28	42	85	132
Number of Channels	2 to 12	2 to 12	2 to 12	2 to 12
Cavity Diameter, in	10	10	10	10
Min. Channel Sep., kHz	50	50	75	75
Isolation Min., TX-TX, dB	70	70	70	80
Isolation Min., Ant-TX, dB	60	60	60	70
Max. Insertion Loss Per Chan., dB	4.1 to 5.7	4.1 to 6.1	4.2 to 6.2	4.3 to 7.1
Continuous Power Input, Watts	150	150	150	150
Connectors	N Female			
VSWR	1.22:1	1.22:1	1.22:1	1.22:1
Temperature, ºC	-40 to +60			
Mechanical Specifications				
Height, in (H x W X D) (mm)	86.5 x 24 x 40.25 (2197 x 610 x 1022) (In X Rack)			
Weight, lbs	DEPENDS ON SET-UP AND RACK DESIGN			
Mounting	19-inch rack mount			

* See appendix for ordering information (Page 240)

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EXPANDABLE TX COMBINER 80 SERIES 406-960 MHz

X-PASS EXPANDABLE TX COMBINER 80 SERIES

Our 80 Series 8" Cavity Transmit Combiner features X-Pass, plug-and-play technology and is fully expandable and reconfigurable. These combiners are designed to offer engineers and technicians many options when designing or upgrading a site.

Electrical Specifications	8N-FF-8XILPI
Frequency Range, MHz	Call for Information
Frequency Separation, kHz	200 min
Number of Channels	1 to 6+
Isolation, dB	
TX to TX @ 200k Sep.	(S)40 (D)70
ANT to TX @ 600k Sep.	(S)30 (D)60
Insertion Loss	See Insertion Loss Chart
TX input Return Loss, dB	1.25:1 min
Power / Channel, Watts	Low=60 / High=100
Mechanical Specifications	
Construction / Finish	Aluminum/Gold/Black
Input Connector	N-Female
Mounting	EIA standard 19"
Temperature Range, °C	-30 to +60
Dimensions	
Cavity Diameter, in (mm)	8 (203)
Width, in (mm)	19 (483)
Depth, in (mm)	UHF 16.5 (419) 700-900MHz 21 (534)
Height, in (mm)	8.7 (221)
Number of Channels	Rack Units | Weight lbs. (kg)
1	5 11 (05)
2	5 22 (10)
3	10 33 (15)
4	10 44 (20)
5	15 55 (25)
6	15 66 (30)

UHF 100-WATT TYPICAL INSERTION

Number of Channels	Frequency Separation (kHz)		
	200	400	600 and +
2	4	3	2.8
3	4.3	3.2	2.85
4	4.6	3.3	2.95
5	4.8	3.4	3
6	5.1	3.5	3.15

UHF 60-WATT TYPICAL INSERTION LOSS, dB

(TX to TX Separations under 400kHz, please use a 100-Watt unit - that spacing requires an external load)

Number of Channels	Frequency Separation (kHz)		
	200	400	600 and +
2	Use 100W	3	2.8
3		3.2	2.85
4		3.3	2.95
5		3.4	3
6		3.5	3.15

700-900MHz 100-WATT TYPICAL INSERTION

Number of Channels	Frequency Separation (kHz)		
	200	500	800 and +
2	3.5	2.5	2.2
3	4.2	3	2.4
4	4.5	3.4	2.5
5	4.8	3.6	2.6
6	5.3	3.7	2.8

* See appendix for ordering information (Page 240)

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XTR

EXPANDABLE, TRANSMIT-RECEIVE, MULTICOUPLER

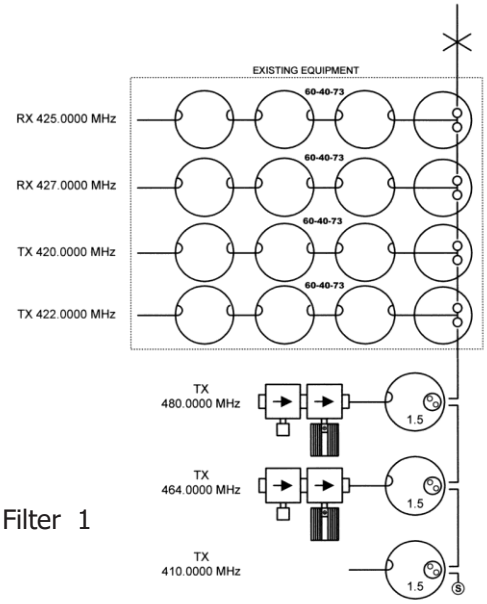
Our X-Pass technology can combine your TX & RX frequencies onto the same antenna. Our System Design Department can integrate any combination of frequency, and close frequency spacing, minimizing the system's physical space, and maximizing the efficiency of your system.

Each of our system designs comes with a full intermodulation study that examines the Intermodulation products followed with a customized solution specific to your clients needs. There are no off-the-shelf solutions - each system is custom tailored to your exact requirements.

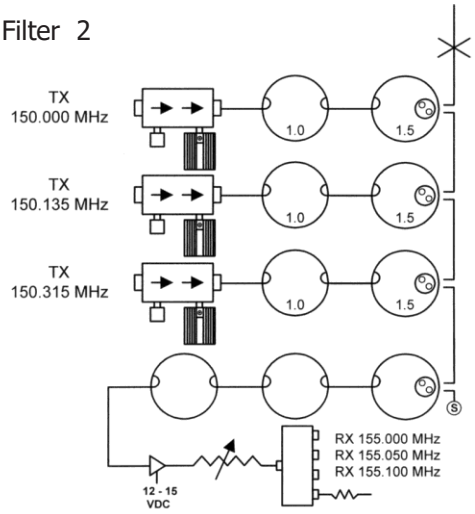
Contact us for a free customized system quotation. TX and RX frequencies will be required.

Here are some design examples:

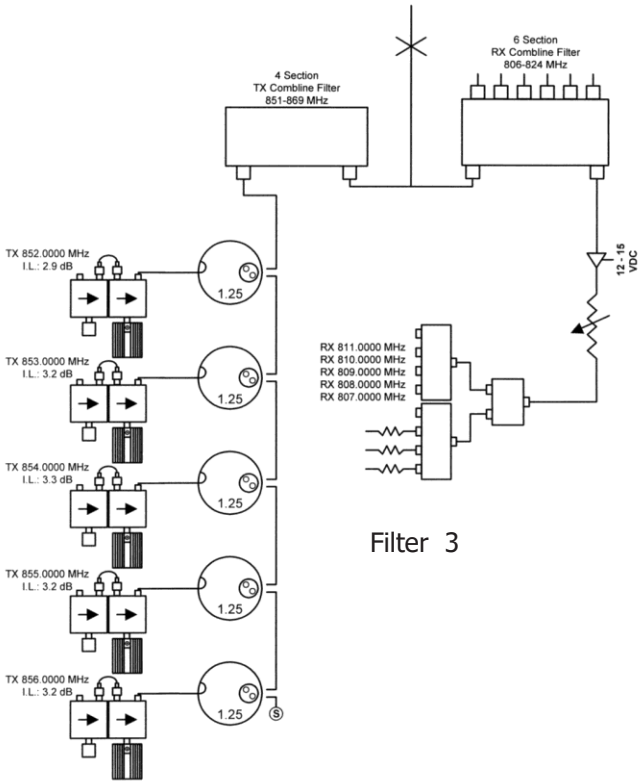
Filter 1



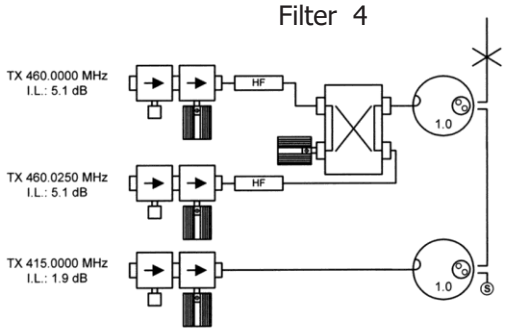
Filter 2



Filter 3



Filter 4



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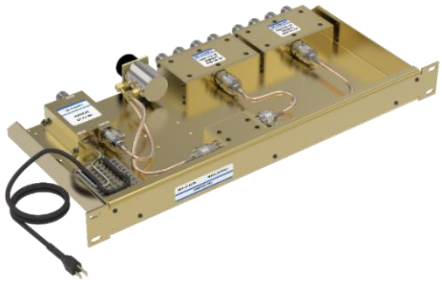
RECEIVER MULTICOUPLER 138-225 MHz

XRM-13-PP Series

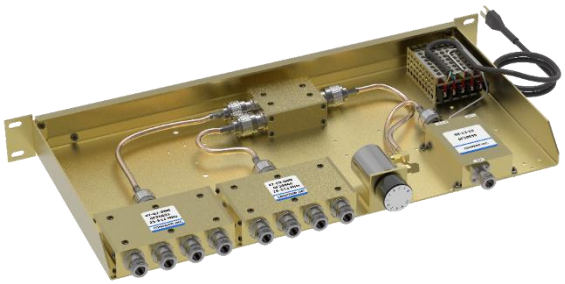
Our Expandable Receiver Multicouplers are simple and compact. They are available in 2, 4, 8, 12, 16 and 32 port configurations. This is an affordable means of combining multiple RX frequencies onto the same antenna. We offer three mounting versions: our standard 19" rack, a tray mounted or a cavity mounted version. Each unit consists of a power splitter and an RF amplifier. Every Expandable Receiver Multicoupler has the optional plug-in power supply.

- Design
  - Simple and cost effective
- Mounting
  - 19" rack mount (RM)
  - Cavity mount (CM)
  - Tray mount (TRM)
- Optional 100-240 VAC power supply (PS)



Electrical Specifications	XRM-13-02	XRM-13-04	XRM-13-08	XRM-13-16	XRM-13-32
Frequency Range, MHz	138-225	138-225	138-225	138-225	138-225
Pass Band, MHz	3-8	3-8	3-8	3-8	3-8
Number of Channels	2	4	8	16	32
RX/RX Isolation, dB	23+	23+	23+	23+	23+
Amplifier Gain, dB	18	18	18	18	18
Amplifier Noise Figure, dB	1.9	1.9	1.9	1.9	1.9
Amplifier Bias Voltage, VDC	+13-28	+13-28	+13-28	+13-28	+13-28
Amplifier Current Draw, mA	130	130	130	130	130
Nominal Impedance, Ohms	50	50	50	50	50
Max VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1
Temperature ºC	-40 to +60				
Mechanical Specifications	**XRM-13-02**	**XRM-13-04**	**XRM-13-08**	**XRM-13-16**	**XRM-13-32**
Mounting	RM / CM	RM / CM	RM / CM	RM / CM	RM / CM
Connectors (Optional)	N-F (BNC)	N-F (BNC)	N-F (BNC)	N-F (BNC)	N-F (BNC)
Weight, lbs	5-12	5-12	5-12	5-12	5-12

* See appendix for ordering information (Page 241)



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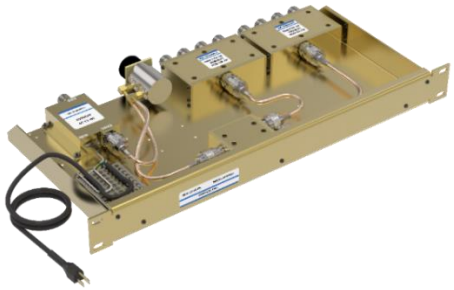
RECEIVER MULTICOUPLER 380-512 MHz

XRM-38-PP Series

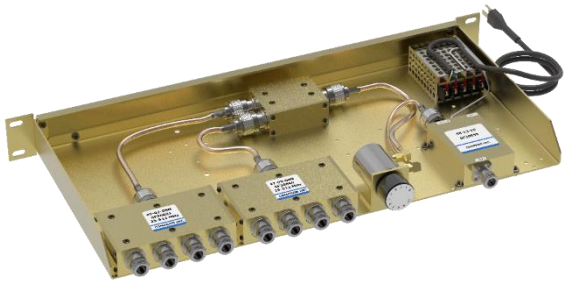
Our Expandable Receiver Multicouplers are simple and compact. They are available in 2, 4, 8, 12, and 32 port configurations. This is an affordable means of combining multiple RX frequencies onto the same antenna. We offer three mounting versions: our standard 19" rack, a tray mounted or a cavity mounted version. Each unit consists of a power splitter and an RF amplifier. Every Expandable Receiver Multicoupler has the optional plug-in power supply.

- Design
  - Simple and cost effective
- Mounting
  - 19" rack mount (RM)
  - Cavity mount (CM)
  - Tray mount (TRM)
- Optional 100-240 VAC power supply (PS)



Electrical Specifications	XRM-38-02	XRM-38-04	XRM-38-08	XRM-38-16	XRM-38-32
Frequency Range, MHz	380-512	380-512	380-512	380-512	380-512
Pass Band, MHz	3-10	3-10	3-10	3-10	3-10
Number of Channels	2	4	8	16	32
RX/RX Isolation, dB	23+	23+	23+	23+	23+
Amplifier Gain, dB	18.5	18.5	18.5	18.5	18.5
Amplifier Noise Figure, dB	1.9	1.9	1.9	1.9	1.9
Amplifier Bias Voltage, VDC	+13-28	+13-28	+13-28	+13-28	+13-28
Amplifier Current Draw, mA	130	130	130	130	130
Nominal Impedance, Ohms	50	50	50	50	50
Max VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1
Temperature ºC	-40 to +60				
Mechanical Specifications	**XRM-38-02**	**XRM-38-04**	**XRM-38-08**	**XRM-38-16**	**XRM-38-32**
Mounting	RM / CM				
Connectors (Optional)	N-F (BNC)				
Weight, lbs	5-12	5-12	5-12	5-12	5-12

* See appendix for ordering information (Page 241)



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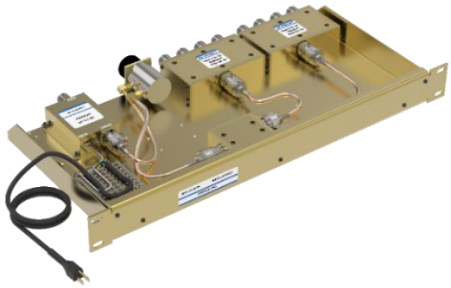
RECEIVER MULTICOUPLER 806-896 MHz

XRM-80-PP Series

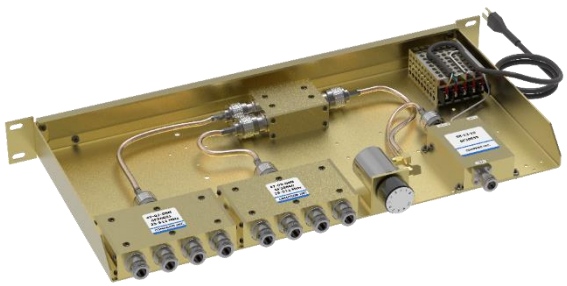
Our Expandable Receiver Multicouplers are simple and compact. They are available in 2, 4, 8, 12, 16 and 32 port configurations. This is an affordable means of combining multiple RX frequencies onto the same antenna. We offer three mounting versions: our standard 19" rack, a tray mounted or a cavity mounted version. Each unit consists of a power splitter and an RF amplifier. Every Expandable Receiver Multicoupler has the optional plug-in power supply.

- Design
  - Simple and cost effective
- Mounting
  - 19" rack mount (RM)
  - Cavity mount (CM)
  - Tray mount (TRM)
- Optional 100-240 VAC power supply (PS)



Electrical Specifications	XRM-80-02	XRM-80-04	XRM-80-08	XRM-80-16	XRM-80-32
Frequency Range, MHz	806-896	806-896	806-896	806-896	806-896
Pass Band, MHz	3-18	3-18	3-18	3-18	3-18
Number of Channels	2	4	8	16	32
RX/RX Isolation, dB	23+	23+	23+	23+	23+
Amplifier Gain, dB	19	19	19	19	19
Amplifier Noise Figure, dB	1.9	1.9	1.9	1.9	1.9
Amplifier Bias Voltage, VDC	+13-28	+13-28	+13-28	+13-28	+13-28
Amplifier Current Draw, mA	130	130	130	130	130
Nominal Impedance, Ohms	50	50	50	50	50
Max VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1
Temperature ºC	-40 to +60				
Mechanical Specifications	**XRM-80-02**	**XRM-80-04**	**XRM-80-08**	**XRM-80-16**	**XRM-80-32**
Mounting	RM / CM				
Connectors (Optional)	N-F (BNC)				
Weight, lbs	5-12	5-12	5-12	5-12	5-12

* See appendix for ordering information (Page 241)



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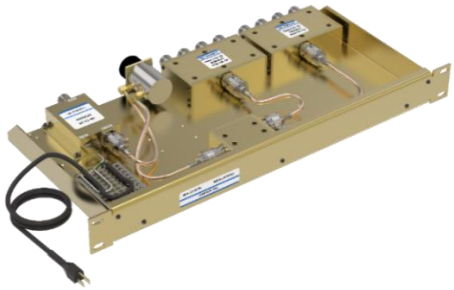
RECEIVER MULTICOUPLER 896-960 MHz

XRM-90-PP Series

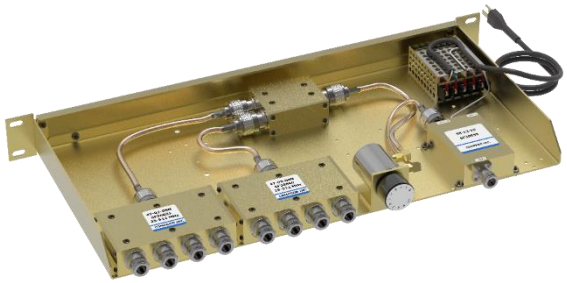
Our Expandable Receiver Multicouplers are simple and compact. They are available in 2, 4, 8, 12, 16 and 32 port configurations. This is an affordable means of combining multiple RX frequencies onto the same antenna. We offer three mounting versions: our standard 19" rack, a tray mounted or a cavity mounted version. Each unit consists of a power splitter and an RF amplifier. Every Expandable Receiver Multicoupler has the optional plug-in power supply.

- Design
  - Simple and cost effective
- Mounting
  - 19" rack mount (RM)
  - Cavity mount (CM)
  - Tray mount (TRM)
- Optional 100-240 VAC power supply (PS)



Electrical Specifications	XRM-90-02	XRM-90-04	XRM-90-08	XRM-90-16	XRM-90-32
Frequency Range, MHz	896-960	896-960	896-960	896-960	896-960
Pass Band, MHz	3-15	3-15	3-15	3-15	3-15
Number of Channels	2	4	8	16	32
RX/RX Isolation, dB	23+	23+	23+	23+	23+
Amplifier Gain, dB	19	19	19	19	19
Amplifier Noise Figure, dB	1.9	1.9	1.9	1.9	1.9
Amplifier Bias Voltage, VDC	+13-28	+13-28	+13-28	+13-28	+13-28
Amplifier Current Draw, mA	130	130	130	130	130
Nominal Impedance, Ohms	50	50	50	50	50
Max VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1
Temperature ºC	-40 to +60				
Mechanical Specifications	**XRM-90-02**	**XRM-90-04**	**XRM-90-08**	**XRM-90-16**	**XRM-90-32**
Mounting	RM / CM				
Connectors (Optional)	N-F (BNC)				
Weight, lbs	5-12	5-12	5-12	5-12	5-12

* See appendix for ordering information (Page 242)



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RECEIVER MULTICOUPLER

XRM-XX-PP-RM-DCM Series

This Receiver Multicoupler with dry contact alarms is available in 2, 4, 8, 12, 16 and 32 port configurations assembled in standard 19" rack. Each unit features continuous monitoring of the power supply voltage and the current drawn by the amplifier to provide alarm notifications via relay contacts when the DC voltage or the current are out of tolerance. In addition, an integrated bypass capability will fully remove the amplifier from the circuit when the power is cut-off or in faulty conditions. The bypass option contributes to protect the amplifier from DC voltages that are out of tolerance and provide a non-amplified connection from the antenna to keep the system up and running even in case of power failure.

* Images are for illustrative purposes only and may differ from the actual product.

Electrical Specifications	XRM-13-PP-RM-DCM	XRM-38-PP-RM-DCM	XRM-70-PP-RM-DCM
Frequency Range, MHz	138-225	380-512	760-940
Rx/Rx Isolation, dB	23+	23+	23+
Amplifier Gain max	31	31	31
Amplifier Noise Figure, dB	1.5	1.5	1.5
Nominal Impedance, Ohms	50	50	50
Max VSWR	1.25:1	1.25:1	1.25:1
3rd Order Intercept, dBm	+43	+43	+43
Maximum Input Power, dBm	0	0	0
Amplifier Bias Voltage, V	12.5 (nom). Voltage range 11-16 V		
Amplifier Current Drawn, mA	(350 @ 15V), (400 @12.5 V), (450 @ 12 V)		
Reverse polarity protection	Yes		
Alarm Output	N.O./N.C. Dry Contacts, 10A @ 125V AC, 5A @ 30V DC rating		
Alarm Conditions	Amplifier VDC outside tolerance, Amplifier IDC outside tolerance		
Mechanical & Environmental Specifications			
RF connectors	N-type female		
Power & Alarm Connectors	8 pins, DIN Rail Terminal Blocks		
Mounting	Standard 19" rack		
Weight, lbs	12 (4 ch)		
Temperature range °C	-40 to +60		

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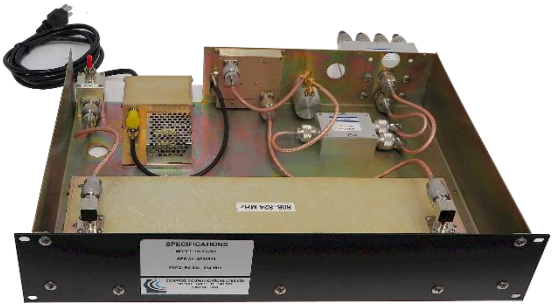
EXPANDABLE RECEIVER MULTICOUPLER — UHF, 794-824 MHz

Expandable Receiver Multicoupler 90 Series

Our Expandable Receiver Multicoupler provides an affordable means of combining multiple Receiver frequencies onto the same antenna. They are available in 2, 4, 8, 12 and 16 port configurations.

Key features:

- A low noise amplifier provides gain across the frequency band
- Low noise figure and low intermodulation generation
- Features up to 16 ports (24 and 32 port versions are available)
- -30 dB signal sampler port that can also be used to inject a signal

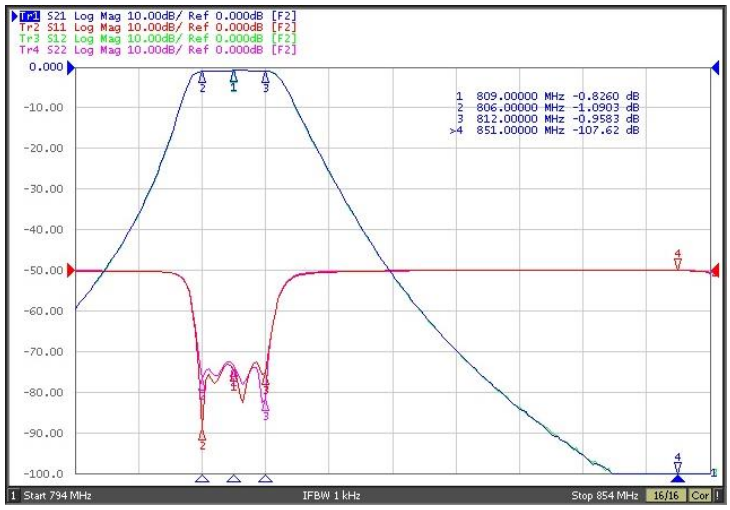


Electrical Specifications		
Frequency Band, MHz	406-512	794-824
Number of output ports	2 to 16 (24 and 32 port versions available)	2 to 16 (24 and 32 port versions available)
Input Preselector Bandwidth Options	2 or 3 MHz Bandwidth 380-512 MHz	794 - 824 MHz, 3/6/12 MHz BW 806 - 821 MHz, 15 MHz BW 806 - 824 MHz, 18 MHz BW 794 - 824 MHz, 30 MHz BW
VSWR	1.5:1	1.5:1
Amplifier Gain, dB	18.5 typical	19 typical
Amplifier Output IP3, dB	+40 Min	+40 Min
Amplifier Noise Figure, dB	1.9 typical	1.9 typical
Manual Attenuation Selection	0 to –10dB in 1 dB steps	0 to –10dB in 1 dB steps
RX to RX Isolation, dB	>20	>20
TX Band Rejection, dB	>40 at 2MHz TX-RX	>80
Connector, Input	N (Female)	N (Female)
Connector, Output	N (Female)	N (Female)
Connector, Signal Sampler	BNC (Female)	BNC (Female)
Power Input, Standard	110/220 VAC 50/60Hz 10W	110/220 VAC 50/60Hz 10W
AC Power Input Connector	Hardwired 3-wire	Hardwired 3-wire
DC Power (optional), VDC	+13-28	+13-28
Mounting	EIA Standard 19” 3 RU	EIA Standard 19” 2 RU
Temperature Range C	-30 to +60 C	-30 to +60 C

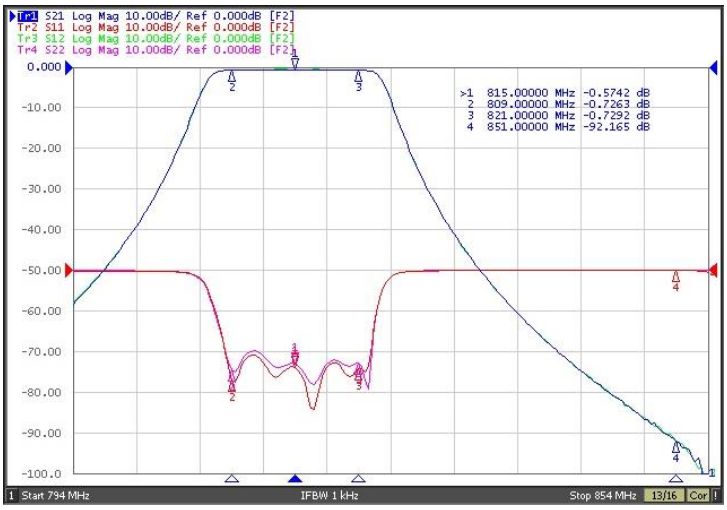
* See appendix for ordering information (Page 242)

EXPANDABLE RECEIVER MULTICOUPLER 406-824 MHz

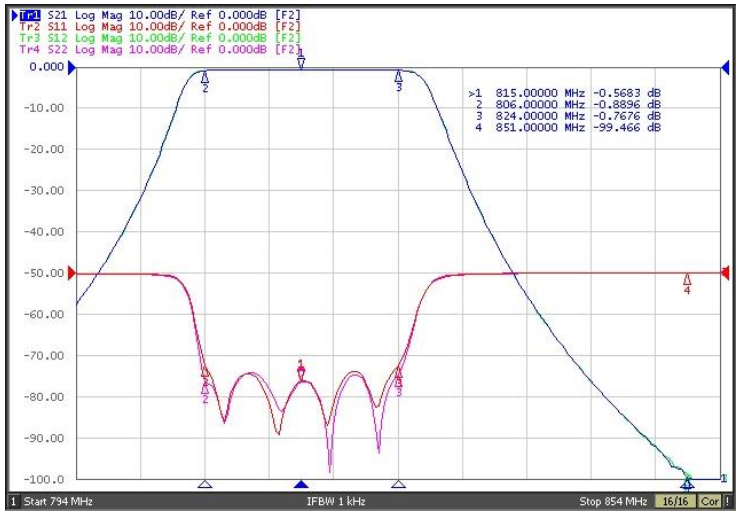
800 MHz Pass: 806-812MHz (6MHz)



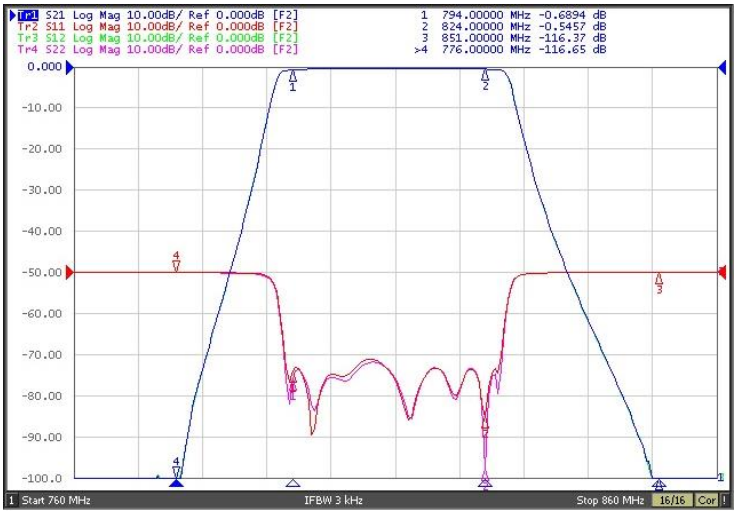
800MHz Pass: 809-821MHz (12MHz)



800MHz Pass: 806-824MHz (18MHz)



800MHz Pass: 794-824MHz (30MHz)



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TTA: TOWER TOP AMPLIFIER 406-902 MHz

Our Tower-Top Amplifier (TTA) systems provide superior receiver system performance and excellent electrical reliability in a rugged, weather-proof design. The tower unit is housed in a seamless cylindrical aluminum housing with a durable finish to repel both weather and solar energy. The aluminum shell connector plate provides much lower electrical resistance than competing stainless steel housings, enhancing the performance of the internal lightning surge protection. A high permeability internal magnetic shield provides protection against damage from lightning-induced magnetic pulses and is many times more effective than a stainless-steel enclosure.

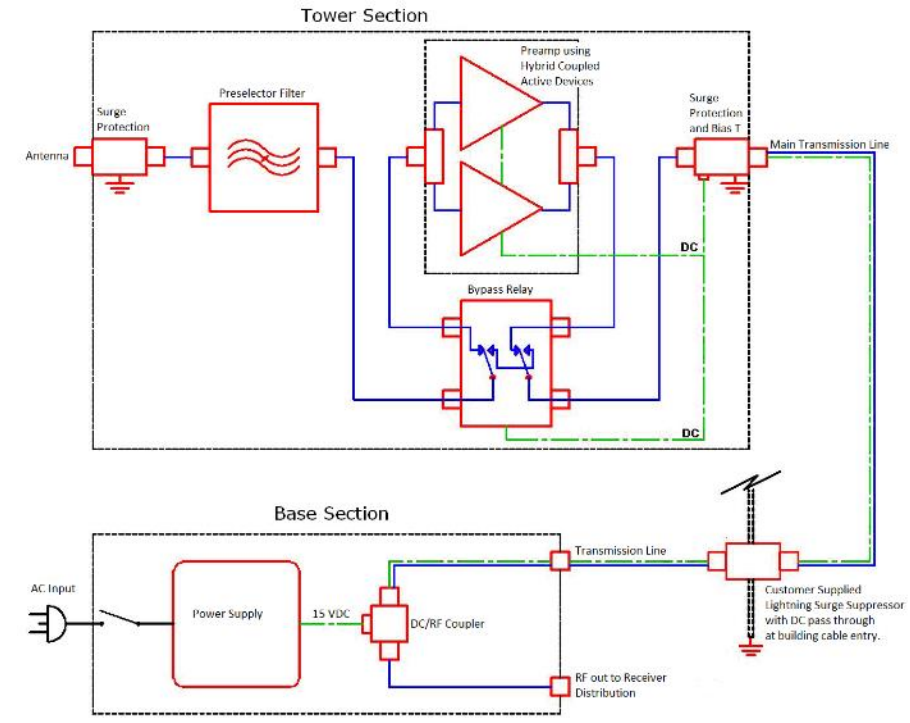
The tower housing has two drain holes to release any water due to condensation build up. RF connections stay weather-resistant longer as a result of the protection provided by a 360° drip- edge. Superior electrical performance starts with a highly selective Combline preselector that provides excellent out-of-band rejection with minimum loss. Our preamplifier uses PHEMT (GaAs FET) device technology to provide low noise performance (1.6dB typical) and high intermodulation immunity (+39 dBm OIP3).

For greater reliability, the preamplifier uses a pair of hybrid -coupled devices to provide amplifier redundancy. This circuit provides useful gain should only one device be operational. The preamp features internal transient suppression that complements lightning surge protection provided on all TTA ports.

In addition to amplifier redundancy, full amplifier bypass capability is provided. A hermetically sealed, high-reliability bypass relay will fully remove the amplifier from the circuit and provide a non-amplified connection from the antenna to keep the system up and running even if the preamplifier totally ceases operation. Bypass mode is activated when DC power to the tower unit is disabled.

The base unit is housed in a 19" rack assembly that includes the power supply and DC injector to send DC (12 V) over the transmission line to operate the tower unit. The base unit has jacks for measurement of tower unit Current using a standard digital multi-meter. Type N connectors provided. Tower unit mounting hardware included.

Building-entry lightning surge suppressor w/DC pass-thru is recommended but not supplied.



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TTA: TOWER TOP AMPLIFIER 406-902 MHz

Tower Section	TTA-40-00	TTA-70-00	TTA-79-00	TTA-80-00	TTA-90-00
Frequency Range, MHz	UHF (406-512)	794-806	792-824	806-824	896-902
Bandwidth, MHZ	2-3	3, 6, 10, 12	32	18	6
Gain, dB	16-19	16-19	16-19	16-19	16-19
Noise Figure, dB	2-4	2-4	2-4	2-4	3-4
3rd Order Intercept Point, dBm	+40	+40	+40	+40	+40
Connectors	N Female				
Power, VDC	+13-28	+13-28	+13-28	+13-28	+13-28
Housing Diameter, in	16 x 14 x 6	7	7	7	7
Housing Length, in	N/A	21	21	21	21
Finish	Grey Anodize				
Temperature Range, °C	- 40° to +50	- 40° to +50	- 40° to +50	- 40° to +50	- 40° to +50
Weight, lbs	45 with clamps	45 with clamps	45 with clamps	45 with clamps	45 with clamps

Base Unit	
Size (H x W x D) in	1.75 x 19 x 6
Finish, Front	Black
Connectors	Transmission Line, RF Output
Connector Type	N Female
Power Input, Standard	110/220 VAC 50/60Hz, 12W
Weight, lbs	5
DC Power (optional), VDC	13-28
Mounting	EIA Standard 19" 1 RU
Temperature Range, C	-0 to +50

* See appendix for ordering information (Page 243)

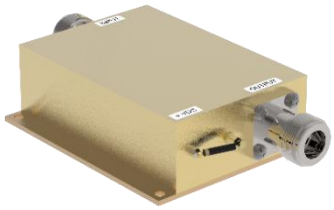
RECEIVER AMPLIFIERS 100-1000 MHz

Models: 58-13-19 (100-225 MHz)
58-40-19 (300-520 MHz)
58-74-19 (700-1000 MHz)

Our line of low noise, medium power robust amplifiers are designed for unconditionally stable performance in professional communications systems. Featuring rugged construction, internal voltage regulator, hybrid-combined redundant amplifier pairs and low pass filters. The amplifiers will provide higher system dynamic range for fixed receiver systems, tower mounted amplifiers, or Bi-Directional in-building repeaters and boosters.

- High Gain, Low Noise - Maximum performance with minimum noise.
- Filtering on DC Terminals - Greater than 70 dB attenuation from as low as 5 MHz to several GHz

Electrical Specifications	58-13-19	58-40-19	58-74-19
Frequency Range, MHz	100-225	380-520	700-1000
Bandwidth, MHz	125	220	300
Amplifier Type	Low Noise / Medium Power		
Typical Gain, dB	19	19	19
Amplifier Noise figure, dB	1.9	1.9	1.9
3rd Order Intercept, dBm	+41	+41	+41
Output 1 dB Compression Point, dBm	25.0	25.0	25.0
Input/output Return loss, dB	-18 Typ.	-18 Typ.	-18 Typ.
Operating Voltage, VDC	12.5-28	12.5-28	12.5-28
Typical DC Current Draw, mA	130	130	130
Standard Connectors (Optional)	N Female		
Maximum Input Power, dBm	+15	+15	+15
Temperature Range, °C	-20 to +70	-20 to +70	-20 to +70
Mechanical Specifications	**58-13-19**	**58-40-19**	**58-74-19**
Height, in (mm)	4.375 (111)	4.375 (111)	4.375 (111)
Width, in (mm)	2.5 (63.5)	2.5 (63.5)	2.5 (63.5)
Depth, in (mm) (including Connectors)	0.9375 (23.8)	0.9375 (23.8)	0.9375 (23.8)
Weight, lb (kg)	0.42 (0.187)	0.42 (0.187)	0.42 (0.187)
Finish	Alodine (yellow)		



* See appendix for ordering information (Page 243)

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US 1.877.825.2007 / CAN 1.800.603.1454
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LOW POWER SINGLE ISOLATORS 138-960 MHz

Our Isolators are among the best in the industry for blocking the transfer of RF power flow in the opposite direction. Low to medium power, and total reliability are two of the characteristics of these isolators. Used for intermodulation panels, protecting your transmitters from reflected power and providing extra isolation are just a few of the possible applications. These isolators can be combined with a variety of loads, 5/25/60/100/150/250-watt combinations, as well as combined with second harmonic filters for Hybrid Combiners (HTCs).

- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band

Electrical Specifications	21-13-XX	21-40-XX	21-76-XX
Frequency Range, MHz	138-174	406-512	746-960
Frequency Split, MHz	4	24	24
Bandwidth	2.5% Cent. Freq.	1% Cent. Freq.	2.5% Cent. Freq.
Continuous Power Input, Watts	100	100	100
Connectors	N Female		
Output Load Size	5/25/60/100/150	5/25/60/100/150	5/25/60/100/150
Reverse Isolation, Db	30	30	30
Typical Insertion Loss, dB	0.45	0.35	0.25
VSWR	1.22:1	1.22:1	1.22:1
Temperature Range, °C	-40 to +60		
Mechanical Specifications	**21-13-XX**	**21-40-XX**	**21-76-XX**
Dimensions, in (H x W x D)	3.94 x 3.75 x 1.78	4.19 x 3.99 x 1.78	5.63 x 3.15 x 1.84
Weight, lbs	1.40	1.41	1.32
Mounting	Cavity / Plate / Cabinet / Rack Mount Are All Available		

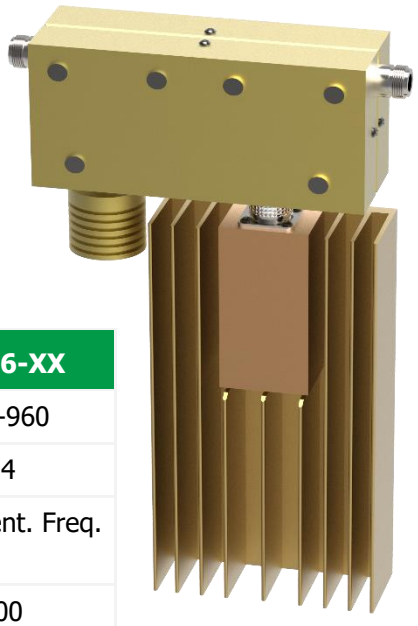
* See appendix for ordering information (Page 243)

LOW POWER DUAL ISOLATORS 138-960 MHz

22-FF-PP

Our Isolators are among the best in the industry for blocking the transfer of RF power flow in the opposite direction. Low to medium power and total reliability are two of the characteristics of these isolators. Used for intermodulation panels, protecting your transmitters from reflected power, and providing extra isolation are just a few of the possible applications. These isolators can be combined with a variety of loads, 5/25/60/100/150/250-watt combinations, and combined with second harmonic filters for Hybrid Combiners (HTCs).

- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band



Electrical Specifications	22-13-XX	22-40-XX	22-76-XX
Frequency Range, MHz	138-174	406-512	746-960
Frequency Split, MHz	4	24	24
Bandwidth	2.5% Cent. Freq.	1% Cent. Freq.	2.5% Cent. Freq.
Continuous Power Input, Watts	100	100	100
Connectors	N Female		
Output Load Size	5/25/60/100/150	5/25/60/100/150	5/25/60/100/150
Reverse Isolation, Db	50	50	50
Typical Insertion Loss, dB	0.9	0.7	0.5
VSWR	1.22:1	1.22:1	1.22:1
Temperature Range, °C	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**22-13-XX**	**22-40-XX**	**22-76-XX**
Dimensions, in (H x W x D)	3.94 x 6.25 x 1.78	4.19 x 8.75 x 1.78	5.63 x 6.13 x 1.84
Weight, lbs	2.6	2.8	2.75
Mounting	Cavity / Plate / Cabinet / Rack Mount Are All Available		

* See appendix for ordering information (Page 243)

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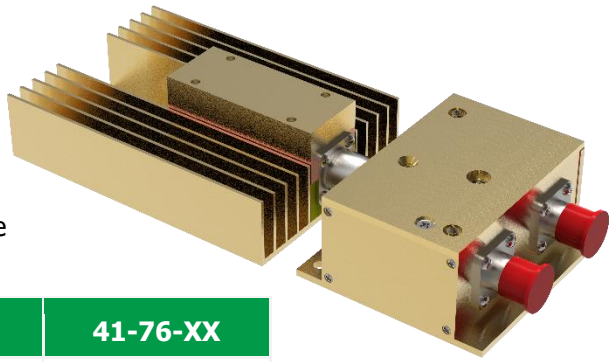
HIGH POWER SINGLE ISOLATORS 138-960 MHz

41-FF-PP

Our Isolators are among the best in the industry for blocking the transfer of RF power flow in the opposite direction. High power and total reliability are two of the characteristics of these isolators. Used for intermodulation panels, protecting your transmitters from reflected power, and providing extra isolation are just a few of the possible applications. These isolators can be combined with a variety of loads, 5/25/60/100/150/250-watt combinations, and combined with second harmonic filters for Hybrid Combiners (HTCs).

- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band



Electrical Specifications	41-13-XX	41-40-XX	41-76-XX
Frequency Range, MHz	138-174	406-512	746-960
Frequency Split, MHz	36	24	24
Bandwidth	2.5% Cent. Freq.	1% Cent. Freq.	2.5% Cent. Freq.
Continuous Power Input, Watts	150	250	150
Connectors	N Female		
Output Load Size	5/25/60/100/150	5/25/60/100/150	5/25/60/100/150
Reverse Isolation, Db	30	30	30
Typical Insertion Loss, dB	0.45	0.45	0.25
VSWR	1.22:1	1.22:1	1.22:1
Temperature Range, ºC	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**41-13-XX**	**41-40-XX**	**41-76-XX**
Dimensions, in (H x W x D)	3.94 x 3.75 x 1.78	4.19 x 3.99 x 1.78	5.63 x 3.15 x 1.84
Weight, lbs	1.40	1.41	1.32
Mounting	Cavity / Plate / Cabinet / Rack Mount Are All Available		

* See appendix for ordering information (Page 243)

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HIGH POWER DUAL ISOLATORS 138-960 MHz

42-FF-PP

Our Isolators are among the best in the industry for blocking the transfer of RF power flow in the opposite direction. High power and total reliability are two of the characteristics of these isolators. Used for intermodulation panels, protecting your transmitters from reflected power, and providing extra isolation are just a few of the possible applications. These isolators can be combined with a variety of loads, 5/25/60/100/150/250-watt combinations, and combined with second harmonic filters for Hybrid Combiners (HTCs).

- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band

Electrical Specifications	42-13-XX	42-40-XX	42-76-XX
Frequency Range, MHz	138-174	406-512	746-960
Frequency Split, MHz	36	24	24
Bandwidth	2.5% Cent. Freq.	1% Cent. Freq.	2.5% Cent. Freq.
Continuous Power Input, Watts	150	250	150
Connectors	N Female	N Female	N Female
Output Load Size	5/25/60/100/150	5/25/60/100/150	5/25/60/100/150
Reverse Isolation, Db	60	60	60
Typical Insertion Loss, dB	0.9	0.7	0.5
VSWR	1.22:1	1.22:1	1.22:1
Temperature Range, ºC	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**42-13-XX**	**42-40-XX**	**42-76-XX**
Dimensions, in (H x W x D)	3.94 x 6.25 x 1.78	4.19 x 8.75 x 1.78	5.63 x 6.13 x 1.84
Weight, lbs	2.6	2.8	2.75
Mounting	Cavity / Plate / Cabinet / Rack Mount Are All Available		

* See appendix for ordering information (Page 244)

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RF LOADS 25-1000 MHz

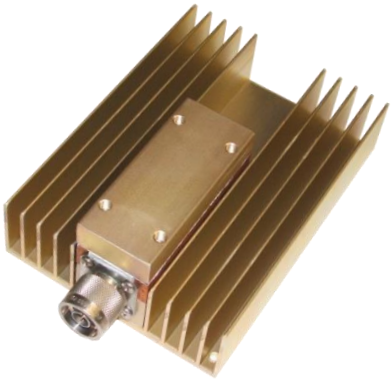
45-05-PP Series

Our continuous power RF Loads have been specifically developed to provide our customers with a product that is extremely reliable. The RF loads are specifically designed to continually absorb reflected power. Our loads are traditionally larger than the industry average. These heavy-duty versions provide constant protection to your transmitters with their oversized heat sinks.

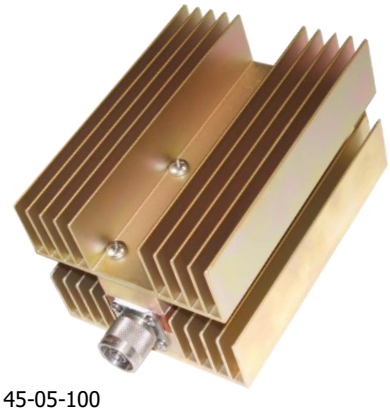
- Excellent return loss
- Continuous duty power
  - 24/7 operation
  - Extremely reliable
- Oversized heat sinks

45-05-05

45-05-25



45-05-60



45-05-100

45-05-250

Electrical Specifications	45-05-05	45-05-25	45-05-60	45-05-100	45-05-250
Frequency Range, MHz	25-1000	25-1000	25-1000	25-1000	25-1000
Load Type	Dry				
Cooling	Natural Air Convention				
Duty Cycle	Continuous				
Connectors	N Male				
Impedance, Ohms	50	50	50	50	50
Maximum RF Input Power, Watts	5	25	60	100	250
Resistor Element Rating, Watts	60	60	250	250	250
Heatsink Area, in (cm)	9.2 (59)	57 (368)	172.7 (1114)	334.7 (2159)	898.2 (5795)
VSWR	1.05:1	1.05:1	1.05:1	1.05:1	1.05:1
Temperature Range, ºC	-40 to +60	-40 to +60	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**45-05-05**	**45-05-25**	**45-05-60**	**45-05-100**	**45-05-250**
Dimensions, in (H x W x D)	1.31 x 1.50	5.06 x 1.50	6.3 x 3.9 x 1.6	6.3 x 3.9 x 2.9	7.4 x 8.00 x 4.3
Weight, lbs	0.18	0.64	1.28	2.00	7.52

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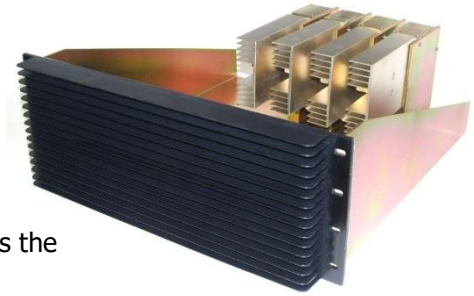
HIGH POWER HYBRID COMBINERS 138-174 MHz

HTC-13-OX

Our Hybrid Transmit Combiners are designed for compact, close frequency installations. Our HTCs are perfect for very closely spaced frequency transmitters. These devices are ideal for use when our X-Pass technology does not provide adequate performance and isolation for very close TX-TX spacing. Hybrid Combiners are also ideal for intermodulation panels, providing extra protection with their second harmonic filters, or when physical space is at a premium, and for providing extra isolation between two very close transmitters.



- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band

Electrical Specifications	HTC-13-04HS	HTC-13-02HS	HTC-13-04HD	HTC-13-02HD
Frequency Range, MHz	138-174	138-174	138-174	138-174
Frequency Split, MHz	30	30	24	24
Bandwidth	2.5% Cent. Freq.	2.5% Cent. Freq.	1% Cent. Freq.	1% Cent. Freq.
Channels	4	2	4	2
Continuous Power Input, Watts*	100	100	100	100
Connectors	N Female			
Isolator	Single	Single	Dual	Dual
Isolation TX/TX, dB	65	65	100	100
Isolation Ant/TX	35+	35+	70+	70+
Typical Insertion Loss, dB	6.8	3.5	7.0	3.7
VSWR	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1
Temperature Range, °C	-40 to +60	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**HTC-13-04HS**	**HTC-13-02HS**	**HTC-13-04HD**	**HTC-13-02HD**
Dimensions, in (H x W x D)	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18
Weight, lbs	42.5	31.5	52	36
Mounting	19" Rack Mount			

*Low power input (60 Watts) models are also available. Please contact our Technical Support team.

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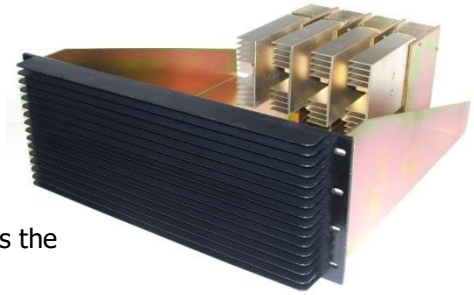
HIGH POWER HYBRID COMBINERS 406-512 MHz

HTC-40-OX

Our Hybrid Transmit Combiners are designed for compact, close frequency installations. Our HTCs are perfect for very closely spaced frequency transmitters. These devices are ideal for use when our X-Pass technology does not provide adequate performance and isolation for very close TX-TX spacing. Hybrid Combiners are also ideal for intermodulation panels, providing extra protection with their second harmonic filters, or when physical space is at a premium, and for providing extra isolation between two very close transmitters.



- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band

Electrical Specifications	HTC-40-04HS	HTC-40-02HS	HTC-40-04HD	HTC-40-02HD
Frequency Range, MHz	406-512	406-512	406-512	406-512
Frequency Split, MHz	30	30	24	24
Bandwidth	2.5% Cent. Freq.	2.5% Cent. Freq.	1% Cent. Freq.	1% Cent. Freq.
Channels	4	2	4	2
Continuous Power Input, Watts*	100	100	100	100
Connectors	N Female			
Isolator	Single	Single	Dual	Dual
Isolation TX/TX, dB	65	65	100	100
Isolation Ant/TX	35+	35+	70+	70+
Typical Insertion Loss, dB	6.8	3.5	7.0	3.7
VSWR	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1
Temperature Range, °C	-40 to +60	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**HTC-40-04HS**	**HTC-40-02HS**	**HTC-40-04HD**	**HTC-40-02HD**
Dimensions, in (H x W x D)	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18
Weight, lbs	40.5	29.5	44.6	31.5
Mounting	19" Rack Mount			

*Low power input (60 Watts) models are also available. Please contact our Technical Support team.

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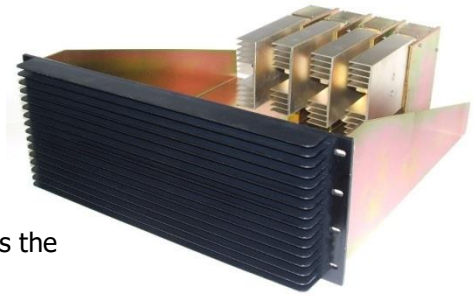
HIGH POWER HYBRID COMBINERS 806-960 MHz

HTC-80-OX

Our Hybrid Transmit Combiners are designed for compact, close frequency installations. Our HTCs are perfect for very closely spaced frequency transmitters. These devices are ideal for use when our X-Pass technology does not provide adequate performance and isolation for very close TX-TX spacing. Hybrid Combiners are also ideal for intermodulation panels, providing extra protection with their second harmonic filters, or when physical space is at a premium, and for providing extra isolation between two very close transmitters.



- High Isolation
  - Minimizes intermodulation products
- Low loss
  - Maximizes system performance
- Continuous Power
  - Physical size and materials used maximize the performance across the operating band

Electrical Specifications	HTC-80-04HS	HTC-80-02HS	HTC-80-04HD	HTC-80-02HD
Frequency Range, MHz	806-960	806-960	806-960	806-960
Frequency Split, MHz	30	30	24	24
Bandwidth	2.5% Cent. Freq.	2.5% Cent. Freq.	1% Cent. Freq.	1% Cent. Freq.
Channels	4	2	4	2
Continuous Power Input, Watts*	100	100	100	100
Connectors	N Female			
Isolator	Single	Single	Dual	Dual
Isolation TX/TX, dB	65	65	100	100
Isolation Ant/TX	35+	35+	70+	70+
Typical Insertion Loss, dB	6.8	3.5	7.0	3.7
VSWR	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1	1.1:1 / 1.3:1
Temperature Range, °C	-40 to +60	-40 to +60	-40 to +60	-40 to +60
Mechanical Specifications	**HTC-80-04HS**	**HTC-80-02HS**	**HTC-80-04HD**	**HTC-80-02HD**
Dimensions, in (H x W x D)	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18	6.5 x 19 x 18
Weight, lbs	11.8	9.3-11	12.8	9.3-11
Mounting	19" Rack Mount			

*Low power input (60 Watts) models are also available. Please contact our Technical Support team.

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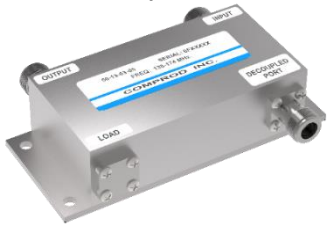
HYBRID & DIRECTIONAL COUPLERS 138-520 MHz

50-FF-YY-XX Series

We offer a full line of compact couplers covering the frequency ranges from 138-174, 215-300, or 350-520 MHz. The full range of coupling values provides balanced power division and distribution. The 50-FF series uses a multilayer bonded PCB design resulting in a high-performance compact design.



- Low insertion Loss, Excellent return Loss.
- Compact dimensions VHF and 220MHz: 5.0x3.70x1.5 in. and UHF: 3.0x3.0x1.5 in.
- 3, 4.8, 6, 7, 10, 15, 20, 30 dB values.
- 200 Watts Maximum main line power. Integrated Mounting Bracket.

Model with No Load	With Integrated 5-Watt Load	With Integrated 25-Watt Load	Frequency Range	Coupling Nom. (dB)	Thruline Loss (dB)	Power Split Ratio (%)
50-13-03-00	50-13-03-05	50-13-03-25	138-174MHz	-3.0	-3.0 ±0.3	50 / 50
50-13-48-00	50-13-48-05	50-13-48-25	138-174MHz	-4.8	-1.8 ±0.2	67 / 33
50-13-06-00	50-13-06-05	50-13-06-25	138-174MHz	-6.0	-1.2 ±0.2	75 / 25
50-13-07-00	50-13-07-05	50-13-07-25	138-174MHz	-7.0	-1.0 ±0.2	80 / 20
50-13-10-00	50-13-10-05	50-13-10-25	138-174MHz	-10.0	-0.5 ±0.2	90 / 10
50-13-15-00	50-13-15-05	50-13-15-25	138-174MHz	-15.0	-0.14 ±0.2	97 / 3
50-13-20-00	50-13-20-05	50-13-20-25	138-174MHz	-20.0	-0.04 ±0.2	99 / 1
50-13-30-00	50-13-30-05	50-13-30-25	138-174MHz	-30.0	-0.04 ±0.2	99.9 / 0.1
50-21-03-00	50-21-03-05	50-21-03-25	215-300MHz	-3.0	-3.0 ±0.3	50 / 50
50-21-48-00	50-21-48-05	50-21-48-25	215-300MHz	-4.8	-1.8 ±0.2	67 / 33
50-21-06-00	50-21-06-05	50-21-06-25	215-300MHz	-6.0	-1.2 ±0.2	75 / 25
50-21-07-00	50-21-07-05	50-21-07-25	215-300MHz	-7.0	-1.0 ±0.2	80 / 20
50-21-10-00	50-21-10-05	50-21-10-25	215-300MHz	-10.0	-0.5 ±0.2	90 / 10
50-21-15-00	50-21-15-05	50-21-15-25	215-300MHz	-15.0	-0.14 ±0.2	97 / 3
50-21-20-00	50-21-20-05	50-21-20-25	215-300MHz	-20.0	-0.04 ±0.2	99 / 1
50-21-30-00	50-21-30-05	50-21-30-25	215-300MHz	-30.0	-0.04 ±0.2	99.9 / 0.1
50-35-03-00	50-35-03-05	50-35-03-25	350-520MHz	-3.0	-3.0 ±0.3	50 / 50
50-35-48-00	50-35-48-05	50-35-48-25	350-520MHz	-4.8	-1.8 ±0.2	67 / 33
50-35-06-00	50-35-06-05	50-35-06-25	350-520MHz	-6.0	-1.2 ±0.2	75 / 25
50-35-07-00	50-35-07-05	50-35-07-25	350-520MHz	-7.0	-1.0 ±0.2	80 / 20
50-35-10-00	50-35-10-05	50-35-10-25	350-520MHz	-10.0	-0.5 ±0.2	90 / 10
50-35-15-00	50-35-15-05	50-35-15-25	350-520MHz	-15.0	-0.14 ±0.2	97 / 3
50-35-20-00	50-35-20-05	50-35-20-25	350-520MHz	-20.0	-0.04 ±0.2	99 / 1
50-35-30-00	50-35-30-05	50-35-30-25	350-520MHz	-30.0	-0.04 ±0.2	99.9 / 0.1

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CERAMIC COMBINER 764-941 MHz

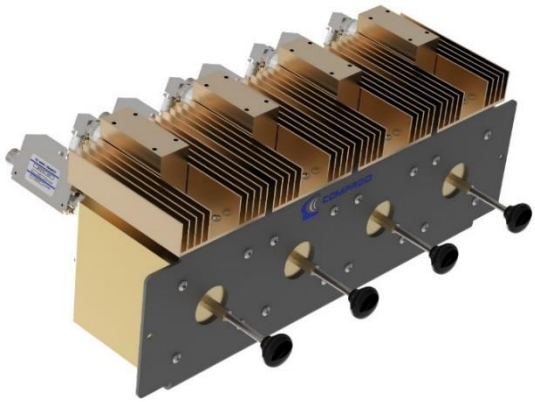
X-Pass Ceramic Combiner

Our Ceramic Combiner uses dielectric resonator technology to offer higher performance than standard RF cavities in a much smaller package. It combines 4 channels in only 7.75" of standard 19" rack space. The resonator allows combining of transmitters at a frequency spacing as close as 150 kHz. Lower insertion loss per channel is another result of the sharper filtering performance.

Expandable in individual channel increments. Available in Star or X-Pass (expandable) configuration.

- Available for the 764-776, 851-869 and 935-941 MHz bands
- Designed for tight channel spacing
- Lowest insertion loss, high isolation for maximum coverage and reduced interference
- Easy field expandability with X-Pass technology - one channel at a time
- Compact, robust design for rapid installations, increased mobility and ease of maintenance

Electrical Specifications	
Frequency Range, MHz	764-776, 851-869 & 935-941
Frequency Spacing, Min.	150 kHz
Temperature Range, °C	-35 to +60
TX to TX Isolation at Minimum Frequency Spacing of 150 kHz	65 dB min (double junction isolator)
ANT to TX Isolation	60 dB min (double junction isolator)
Insertion Loss	1.8 dB – 4 Ch. at 500 kHz 2.5 dB – 16 Ch. at 500 kHz 3.8 dB – 24 Ch. at 500 kHz
Power Input / Channel (Watts)	125
Transmitter Input VSWR (max)	1.25:1
Mechanical Specifications	
Dimensions (HWD), in (mm)	7.75 x 19 x 14 (197 x 483 x 356)
Weight, lb (kg)	4-Channel system 32 (15)



Order Information

DRXC	-	FF	-	XX	N or D

DRXC	Dielectric Resonator X-Pass Configuration
FF	Frequency band: 76=764-776 / 85=851-869 / 93=935-940
XX	Number of Channels
N or D	Type of Connector N = N Female Connectors D = DIN Connectors

Example: Model # DRXC-76-04N

X-Pass Ceramic Combiner, 764-776 MHz,
4 Channel N Connectors

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CROSS-BAND/X-BAND COUPLER 25-960 MHz

Our Cross-Band Couplers are designed for easy installation, reduced coaxial runs, and in-building applications for multi-band antennas. They allow multiple bands to share the same transmission lines. They are available in VHF, UHF and 800/900MHz bands. They can be tower mounted (TM), rack mounted (RM), tray-mounted (TRM) or stand alone.

Electrical Specifications		XBC-02-38	XBC-02-38-R	XBC-38-76	XBC-38-76-R	XBC-38-76-RX
Frequency Range, MHz	1st	25-175	25-175	380-512	380-512	380-512
	2nd	380-960	380-960	764-960	764-960	764-960
Typical Loss, dB	1st	0.35	0.35	0.20	0.35	0.30
	2nd	0.50	0.50	0.20	0.50	0.50
Isolation, dB		40	40	40	40	40
Power Rating, Watts	1st	250	RX Only	250	RX Only	250
	2nd	250	RX Only	250	RX Only	RX Only
Connectors		N Female				
VSWR		1.25:1				
Temperature ºC		-40 to +60	-40 to +60	-40 to +60	-40 to +60	-40 to +60

Mechanical Specifications	XBC-02-38	XBC-02-38R	XBC-38-80	XBC-38-80R	XBC-38-80RX
Dimensions	DEPENDS on Mounting Configuration				
Rack Mount	DEPENDS on Mounting Configuration				
Tower Mount	DEPENDS on Mounting Configuration				

* See appendix for ordering information (Page 244)

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COMBLINE FILTERS / PRESELECTORS 450-960 MHz

57-FF-XX Series

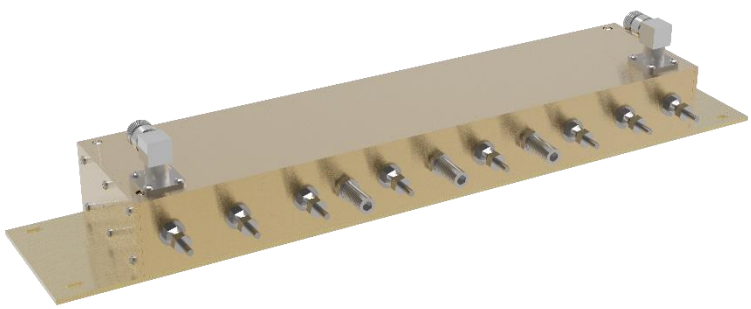
Our Combline filters are designed for minimizing interference from adjacent channels and outside systems. They are available in a wide range of bandwidths and frequency splits. Used in front of a wideband receiver multicoupler, the preselectors narrow the passband to the desired bandwidth. Each filter is temperature compensated for operation between -40ºC to +60ºC. Each filter has silver-plated loops, and silver-plated tuning rods. Comprod Inc. preselectors are available in a wide range of frequency splits, bandwidth and cavity sizes.

- Temperature Compensation
  - Ensures Frequency Stability
- High Attenuation
  - Minimizes desense and interference from adjacent systems

Several other preselectors are also available. They include comblines and our full line of cavity-based preselectors. Sizes range from the very compact 1" helical filter to the very selective 6.625" cavity preselector. Please contact our Technical Support team for consultation at sales@comprodcom.com

Electrical Specifications	57-45-04	57-80-05	57-80-07	57-80-15	57-80-18
Frequency Range, MHz	450-470	766-960	766-960	766-960	766-960
Type	Combline				
Insertion Loss Bandwidth, dB	3	1.5	1.5	0.8	0.8
Pass Bandwidth, MHz	4.0	5.0	7.0	15.0	18.0
Return Loss, dB (VSWR)	20 (1.22)	20 (1.22)	20 (1.22)	20 (1.22)	20 (1.22)
Typical Selectivity, dB @ MHz	38 @ 5	80 @ 45	80 @ 45	70 @ 45	70 @ 45
Temperature Range, ºC	-30 to +60	-30 to +60	-30 to +60	-30 to +60	-30 to +60
Input Power, Watt	RX Only				
Connectors, Antenna/Output	N-F/N-F				
Mechanical Specifications	**57-45-04**	**57-80-05**	**57-80-07**	**57-80-15**	**57-80-18**
Finish	Black	Black and gold Alodine			
Dimensions H x W x D, in (mm)	5.25 x 19 x 4.5	3.5 x 19 x 6	3.5 x 19 x 6	3.5 x 19 x 6	3.5 x 19 x 6
	(133 x 686 x 114)	(89 x 483 x 152)	(89 x 483 x 152)	(89 x 483 x 152)	(89 x 483 x 152)

Order information: specify working frequency, bandwidth, power and isolation required.



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POWER SPLITTERS 25-2700 MHz

We offer a full line of Power Splitters. The 47-02-XXN and 47-70-XXN series is a hybrid design which provides 20 dB or more of port-to-port isolation. They are typically used on receiver multicoupler applications. They provide low loss above the splitting loss and cover a very wide frequency range. N connectors are standard but other connectors are available. Standard finish is gold Alodine.

Electrical Specifications	47-02-02	47-02-04	47-35-02	47-35-04	47-35-08
Frequency Range, MHz	25-512	25-512	350-1000	350-1000	350-1000
Impedance, Ohms	50	50	50	50	50
Number of Outputs	2	4	2	4	8
Split Loss, dB	3	6	3	6	9
Insertion Loss, dB	.3	.5	.3	.3	1.0
VSWR (All Ports)	< 1.2:1	< 1.2:1	< 1.25:1	< 1.25:1	< 1.4:1
Port to Port Isolation	20	20	20	20	20
Power Rating Watts	RX Only				
Split Ratio	50%	25%	50%	25%	12.5%
Connectors (All Ports)	N-Female / BNC				

Mechanical Specifications	47-02-02	47-02-04	47-70-02	47-70-04	47-70-08
Length, in (mm)	3.5 (89)	3.5 (89)	3.5 (89)	3.5 (89)	3.5 (89)
Height, in (mm)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)
Width, in (mm)	2.25 (57)	4.25 (114)	2.25 (57)	4.5 (114)	8.05 (204)
Weight, lbs (Kg)	.5 (230)	.96 (435)	.4 (185)	.96 (435)	2.6 (1150)
Mounting	Tray/Deck				

FILTER RACKS AND MOUNTING

Filter Rack Mounting Systems

Our filter racks are designed for flexible, space saving filter systems. Each rack has its own benefits, space constraints, ease of installation and cost effectiveness.

We offer four types of racks:

19-inch Standard Rack

This is a standard 19" rack with mounting holes on either side of the rack for ease of installation. Racks are available in different heights.

X-Rack

The X-Rack was specifically developed for our X-Series Cavities. This rack system allows for maximum cavity installation but minimizes the amount of physical space that is used. All cavities mount horizontally for easy installation and removal. Most X-Rack systems will be supplied turnkey and pre-assembled for quick installation. The maximum capacity per rack is 21 cavities. Racks are available in different heights.

Stack Rack

The Stack Rack is used when space is at a premium. It must be assembled on-site. Two Stack Racks can hold 40 cavities. All cavities are mounted horizontally, with 4 cavities per row.

Wall-Mount and Cabinets

We have multiple versions of these cabinets and cavity mounts. Please contact us for additional information. Do not hesitate to ask for custom installations.

We offer four types of mounting hardware:

- Cabinet Mount (CM)
- Wall Mount (WM)
- Rack Mount (RM)
- Tower Mount (TM)
- Tray Mount (TRM)

We supply mounting hardware manufactured to your specifications. We offer the ability to design and build your custom concepts.

Rack Style	Model Number	Cavity Size	Cavity Length	# of Cavity	Height	Width	Depth
X Rack	19-10-26-13	10"	26"	13	79.5"	24"	28.69"
X Rack	19-07-11-20	6.625"	11.5"	20	86.5"	24"	14.19"
X Rack	19-07-26-20	6.625"	26"	20	86.5"	24"	28.69"
X Rack	19-07-13-20	6.625"	13"	20	86.5"	24"	15.81"
X Rack	19-10-26-19	10"	26"	19	108"	24"	28.69"
Stack Rack	HRV-85	6.625"	26"	20	42.62"	32.75"	30.25"
Stack Rack	HRU-85	6.625"	11.5"	20	42.62"	32.75"	18.25"
19" Standard	Call for Available Dimensions						

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FILTER RACKS AND MOUNTING

19″ Standard Rack

X Rack

Wall Mount

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