



Transmit Combiners

YOU'RE HEARD, LOUD AND CLEAR.

TRANSMITTER COMBINERS

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COMBINERS/MULTICOUPLERS

118-960 MHz

Bird Technologies Group, TX RX Systems brand time-proven combiners and multicouplers provide design security for any multi-channel radio system. From the most complex multi-site Homeland Security system to the simplest 2-channel private system, our products enables unsurpassed flexibility to accommodate the most challenging frequency plans, as well as future expandability. The same architecture used for transmitter combining can also be used as a preselector in complex receive systems where there is not sufficient guard-band to use combine bandpass filters. Proven low-loss and low PIM construction techniques are used such as welded cavity construction; silver-plated loops, Alballoy®-plated integrated loop plates and connectors; as well as a unique fingerstock-free high conductivity silver-plated tuning probe. Our patented internal temperature compensation insures that transmitter cavities remain in tune even when connected to high duty cycle transmitters. Coupled with either Peg Rack or 19" rack and TX RX's own high-isolation transmitter isolators, the TX RX combining and multicoupling system continues to hold its position as the gold standard in the demanding private and public Safety market. And all TX RX products are designed and manufactured in the USA.



TX RX provides multicoupling systems, not "one-size-tries-to-fit-all" products. Each system is designed and configured for the specific site at which it is to be used. Intermodulation studies as well as transmitter noise and receiver desense estimates are used to design the unit with the required isolation characteristics for the environment where it will be used.

T-Pass®

Broadband architecture of the T-Pass® circuit and coaxial cavities mitigates equipment obsolescence and facilitates ease of system reconfiguration when re-banding is necessary

Each System configured for optimum performance

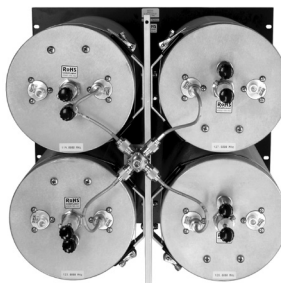
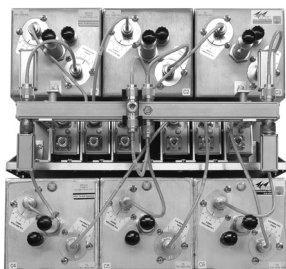
Ideal for applications with minimal guard band between transmit and receive frequencies

Star-Junction

High performance specifications with narrow adjacent channel spacing and low insertion loss

5.8" Square Cavity or 8" Round Cavity with 19" rack mount configuration for space efficiency

Same length interconnect for ease of retuning and expansion in the field



T-PASS COMBINERS

Technical Specifications

118-136 MHz

Model Numbers/ Frequency	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	118-136 MHz
Cavity Type and Diameter	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	Quarterwave, 6.625" (168 mm) Quarterwave, 10" (254 mm)
Maximum Continuous Transmit Power		See table on right
Isolator Load Pwr (Continuous) [Note 3]	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	5W/25W 5W/100W 5W/25W 5W/100W
Min Tx-Tx Separation @ Cavity Loss	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	100 kHz @ -1.5 dB; 60 kHz @ -2.5 dB 80 kHz @ -1.5 dB; 45 kHz @ -2.5 dB
Typical Tx-Tx Isolation @ Min Separation		-70 dB
Typical Antenna - TX Isolation		-60 dB
Typical TX Noise Suppression		Depends on cavity loss (See curves below)
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		-20 dB (1.22:1)
Temperature Range		-30 to +60 Celsius
Connectors, Input & Antenna		N
Mechanical Mounting		Peg Rack®
Mounting Options [Notes 4,5]	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	MC: 19" rackmount adapter plates, 17.5" high LR: System supplied without Peg Rack®
Maximum Channels Per Rack [Notes 4]	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	15 15 12 12
Dimensions [Notes 6]	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	65.25"Hx24"Wx40.25"D (1659x610x1022mm) 79.5"Hx24"Wx42.5"D (2019x610x1080 mm)
Weight, lb (Kg) - Basic Single-Channel	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	38 (17.2) 39 (17.7) 44 (19.9) 45 (20.4)
Weight, lb (Kg) - Expansion Channel Assy	73-35A-01-2B-nn 73-35A-01-2D-nn 73-35A-05-2B-nn 73-35A-05-2D-nn	16 (7.2) 17 (7.7) 21 (9.5) 22 (10.0)

- Notes:
- nn in model number represents the number of channels.
 - Consult factory on T-Pass multicouplers for frequencies below 118 MHz.
 - Models available with 5W/60W loads. Same specifications as 25W and 100W models, except load power.
 - MC option reduces maximum number of channels to ten 10-inch or twelve 6.625-inch channels per rack.
 - LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
 - Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 3.3" (84 mm).

Typical Insertion Loss and Maximum Input Power

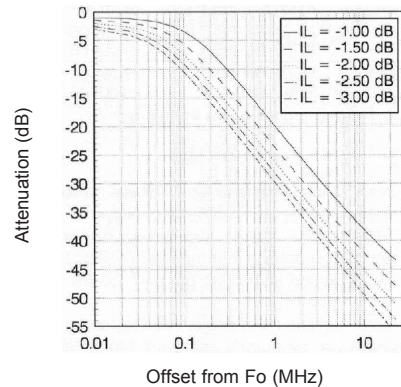
73-35A-01-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels		
			2	4	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-3.3
250 kHz	-1.5 dB	150 W	-2.7	-3.0	-3.6
100 kHz	-1.5 dB	150 W	-3.2	-4.0	-5.1
75 kHz	-2.0 dB	135 W	-3.6	-4.5	-5.6
50 kHz	Use 10" cavities at this separation				

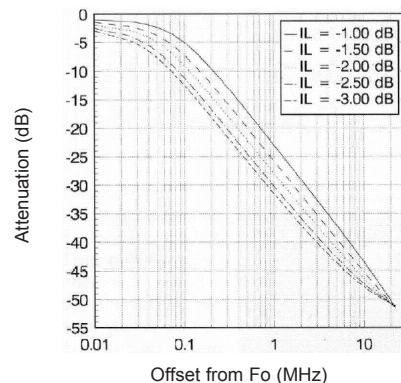
73-35A-05-Series Systems (10" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels		
			2	4	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-3.2
250 kHz	-1.5 dB	150 W	-2.6	-2.9	-3.4
100 kHz	-1.5 dB	150 W	-2.9	-3.6	-4.4
75 kHz	-2.0 dB	150 W	-3.5	-4.1	-4.9
50 kHz	-2.5 dB	130 W	-4.1	-4.8	-5.7

73-35A-01 Series Systems
6.625" Diameter Quarterwave Fo=124MHz



73-35A-05-Series Systems
10" Diameter Quarterwave, Fo=124 MHz



T-PASS COMBINERS

Technical Specifications

132-174 MHz

Model Numbers/ Frequency	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	132-174 MHz
Cavity Type and Diameter	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	Quarterwave, 6.625" (168 mm) Quarterwave, 10" (254 mm)
Maximum Continuous Transmit Power		See table on right
Isolator Load Pwr (Continuous) [Note 3]	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	5W/25W 5W/100W 5W/25W 5W/100W
Min Tx-Tx Separation @ Cavity Loss	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	125 kHz @ -1.5 dB; 75 kHz @ -2.5 dB
Typical Tx-Tx Isolation @ Min Separation		-70 dB
Typical Antenna - TX Isolation		-60 dB
Typical TX Noise Suppression		Depends on cavity loss (See curves below)
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		-20 dB (1.22:1)
Temperature Range		-30 to +60 Celsius
Connectors, Input & Antenna		N
Mechanical Mounting		Peg Rack®
Mounting Options [Notes 4,5]	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	MC: 19" rackmount adapter plates, 17.5" high LR: System supplied without Peg Rack®
Maximum Channels Per Rack [Notes 4]	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	15 15 12 12
Dimensions [Notes 6]	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	79.5"Hx24"Wx36.9"D (1659x610x937mm) 79.5"Hx24"Wx26.9"D (2019x610x937mm)
Weight, lb (Kg) - Basic Single-Channel	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	33 (17.5) 37 (17.7) 41 (18.6) 42 (19)
Weight, lb (Kg) - Expansion Channel Assy	73-38-01-2B-nn 73-38-01-2D-nn 73-38-05-2B-nn 73-38-05-2D-nn	15 (6.8) 16 (7.2) 19 (8.6) 20 (9.1)

- Notes:
- nn in model number represents the number of channels.
 - Consult factory on T-Pass multicouplers for frequencies above 174 MHz.
 - Models available with 5W/60W loads. Same specifications as 25W and 100W models, except load power.
 - MC option reduces maximum number of channels to ten 10-inch or twelve 6.625-inch channels per rack.
 - LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
 - Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 5.4" (137 mm).

Typical Insertion Loss and Maximum Input Power

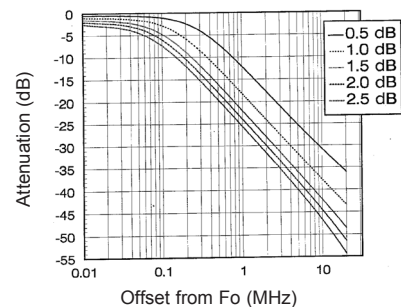
73-38-01-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels		
			2	4	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-3.3
250 kHz	-1.5 dB	150 W	-3.3	-4.5	-5.7
100 kHz	-2.0 dB	135 W	-3.6	-4.5	-5.5
75 kHz	-2.5 dB	115 W	-4.3	-5.4	-6.7
50 kHz	Use 10" cavities at this separation				

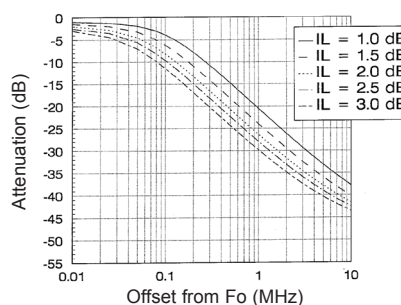
73-38-05-Series Systems (10" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels		
			2	4	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-3.1
250 kHz	-1.5 dB	150 W	-2.9	-3.4	-4.0
100 kHz	-1.5 dB	150 W	-3.0	-3.7	-4.5
75 kHz	-2.0 dB	150 W	-3.5	-4.2	-5.0
50 kHz	-2.5 dB	130 W	-4.1	-5.0	-6.1

73-38-01 Series Systems
6.625" Diameter Quarterwave, Fo=160 MHz



73-38-05-Series Systems
10" Diameter Quarterwave, Fo=160 MHz



T-PASS COMBINERS

Technical Specifications

215-300 MHz

Model Numbers/ Frequency	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	215-300 MHz
Cavity Type and Diameter	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	Quarterwave, 6.625" (168 mm) Quarterwave, 10" (254 mm)
Maximum Continuous Transmit Power		See table on right
Isolator Load Pwr (Continuous) [Note 3]	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	5W/25W 5W/100W 5W/25W 5W/100W
Min Tx-Tx Separation @ Cavity Loss	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	125 kHz @ -1.5 dB; 75 kHz @ -2.5 dB
Typical Tx-Tx Isolation @ Min Separation		-70 dB
Typical Antenna - TX Isolation		-60 dB
Typical TX Noise Suppression		Depends on cavity loss (See curves below)
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		-20 dB (1.22:1)
Temperature Range		-30 to +60 Celsius
Connectors, Input & Antenna		N
Mechanical Mounting		Peg Rack®
Mounting Options [Notes 4,5]	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	MC: 19" rackmount adapter plates, 17.5" high LR: System supplied without Peg Rack®
Maximum Channels Per Rack [Notes 4]	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	15 15 12 12
Dimensions [Notes 6]	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	65.25"Hx24"Wx26.4"D (1659x610x671mm) 79.5"Hx24"Wx28.4D (2019x610x721mm)
Weight, lb (Kg) - Basic Single-Channel	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	34 (17.2) 35 (17.7) 39 (19.9) 40 (20.4)
Weight, lb (Kg) - Expansion Channel Assy	73-54A-01-2B-nn 73-54A-01-2D-nn 73-54A-05-2B-nn 73-54A-05-2D-nn	14 (7.2) 15 (7.7) 18 (9.5) 19 (10)

- Notes:
1. -nn in model number represents the number of channels.
 2. Consult factory on T-Pass multicouplers for frequencies below 215 or above 300 MHz.
 3. Models available with 5W/60W loads. Same specifications as 25W and 100W models, except load power.
 4. -MC option reduces maximum number of channels to ten 10-inch or twelve 6.625-inch channels per rack.
 5. -LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
 6. Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 3.9" (99 mm).

Typical Insertion Loss and Maximum Input Power

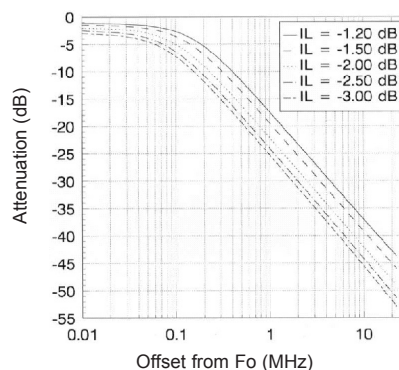
73-54A-01-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-3.0	-3.3
250 kHz	-1.5 dB	150 W	-2.9	-3.4	-3.8	-4.1
175 kHz	-1.5 dB	150 W	-3.1	-3.9	-4.5	-4.9
125 kHz	-2.0 dB	135 W	-3.6	-4.4	-4.9	-5.3
100 kHz	-2.5 dB	115 W	-4.1	-4.5	-5.4	-5.8

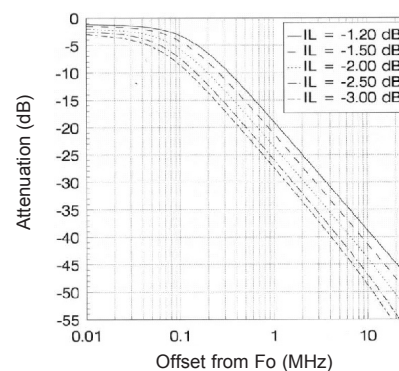
73-54A-05-Series Systems (10" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5 dB	150 W	-2.6	-2.7	-2.9	-3.1
250 kHz	-1.5 dB	150 W	-2.8	-3.1	-3.4	-3.7
150 kHz	-1.5 dB	150 W	-3.4	-3.8	-4.3	-4.6
100 kHz	-2.0 dB	150 W	-3.6	-4.5	-5.1	-5.5
75 kHz	-2.5 dB	130 W	-4.2	-5.1	-5.8	-6.2

73-54A-01-Series Systems
6.625" Diameter Quarterwave, Fo=124 MHz



73-54A-05-Series Systems
10" Diameter Quarterwave, Fo=124 MHz



T-PASS COMBINERS

Technical Specifications

380-420 MHz

Model Numbers/ Frequency	73-56-11-2D-nn	380-420 MHz
Cavity Type and Diameter	73-56-11-2D-nn	3/4-wave, 6.625" (168 mm)
Maximum Isolator Input Power (Continuous)		125 W
Isolator Load Pwr (Continuous) [Note 3]	73-56-11-2D-nn	5W/100W
Min Tx-Tx Separation @ Cavity Loss	73-56-11-2D-nn	150 kHz @ -2.0 dB
Typical Tx-Tx Isolation @ Min Separation		80 dB
Typical Antenna - TX Isolation		70 dB
Typical TX Noise Suppression		See curves below
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		20 dB (1.22:1)
Temperature Range		-30 to +60 Celsius
Connectors, Input & Antenna		N
Mechanical Mounting		Peg Rack®
Mounting Options [Notes 4,5]	73-56-11-2D-nn	MC: 19" rackmount adapter plates, 17.5" high LR: System supplied without Peg Rack®
Maximum Channels Per Rack [Notes 4]	73-56-11-2D-nn	15
Dimensions [Notes 6]	73-56-11-2D-nn	65.25"Hx24"Wx37.5"D (1659x610x953mm)
Weight, lb (Kg) - Basic Single-Channel	73-56-11-2D-nn	34 (16.7)
Weight, lb (Kg) - Expansion Channel Assy	73-56-11-2D-nn	16 (7.2)

- Notes:
1. -nn in model number represents the number of channels.
 2. These specifications are applicable to 380-420 MHz models.
 3. Models available with 5W/60W loads. Same specifications as 100W models, except load power.
 4. -MC option reduces maximum number of channels to twelve 6.625-inch channels per rack.
 5. -LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
 6. Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 5.1" (130 mm).
 7. 380-400 MHz = 73-56A-11-xx-T
400-420 MHz = 73-56B-11-xx-T

Expansion Channel Specifications

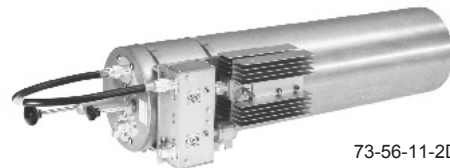
T-Pass Multiplexer Model Number	73-56-11-xx-Series 73-56-11-xx-Series	
Frequency Range	73-56-11-xx-Series 73-56-11-xx-Series	380-400 MHz 400-420 MHz
Cavity Diameter		6.625"
Isolator Power		150 W
Isolator Load		See note below
Expansion Channel Model Number	73-56-11-xx-Series 73-56-11-xx-Series	21-56A-11-xx-T 21-56B-11-xx-T
Starter Channel Model Number	73-56-11-xx-Series 73-56-11-xx-Series	21-56A-11-xx-TS 21-56B-11-xx-TS

Note: "xx" in model number describes isolator and load configuration:
2B= 5W/100W

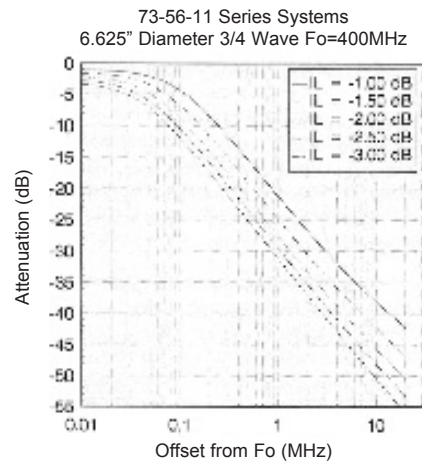
Typical Insertion Loss and Maximum Input Power

73-56-11-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dBo vs. No. of channels)			
			2	4	8	12
1 MHz	-1.5	150 W	-2.4	-2.6	-2.9	-3.1
250 kHz	-1.5	150 W	-2.9	-3.8	-4.4	-4.7
150 kHz	-2	125 W	-3.6	-4.8	-5.6	-6.0



73-56-11-2D-T



T-PASS COMBINERS

Technical Specifications

406-512 MHz

Model Numbers/ Frequency	73-67-11-2B-nn	406-512 MHz
	73-67-11-2D-nn	
	73-67-25-2B-nn	
Cavity Type and Diameter	73-67-11-2B-nn	3/4-wave, 6.625" (168 mm)
	73-67-11-2D-nn	3/4-wave, 6.625" (168 mm)
	73-67-25-2B-nn	3/4-wave, 10" (254 mm)
Maximum Isolator Input Power (Continuous)		150 W
Isolator Load Pwr (Continuous) [Note 3]	73-67-11-2B-nn	5W/25W
	73-67-11-2D-nn	5W/100W
	73-67-25-2B-nn	5W/25W
Min Tx-Tx Separation @ Cavity Loss	73-67-11-2B-nn	125 kHz @ -1.5 dB; 115 kHz @ -2.5 dB
	73-67-11-2D-nn	125 kHz @ -1.5 dB; 115 kHz @ -2.5 dB
	73-67-25-2B-nn	150 kHz @ -1.5 dB; 75 kHz @ -2.5 dB
Typical Tx-Tx Isolation @ Min Separation		80 dB
Typical Antenna - TX Isolation		70 dB
Typical TX Noise Suppression		Depends on cavity loss (See curves below)
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		20 dB (1.22:1)
Temperature Range		-30 to +60 Celsius
Connectors, Input & Antenna		N
Mechanical Mounting	73-67-11-2B-nn	Peg Rack®
	73-67-11-2D-nn	Peg Rack®
	73-67-25-2B-nn	Peg Rack®
Mounting Options [Notes 4,5]	73-67-11-2B-nn	MC: 19" rackmount adapter plates,
	73-67-11-2D-nn	17.5" high
	73-67-25-2B-nn	without Peg Rack®
Maximum Channels Per Rack [Notes 4]	73-67-11-2B-nn	15
	73-67-11-2D-nn	15
	73-67-25-2B-nn	12
Dimensions [Notes 6]	73-67-11-2B-nn	65.25"Hx24"Wx36"D (1659x610x914mm)
	73-67-11-2D-nn	65.25"Hx24"Wx36"D (1659x610x914mm)
	73-67-25-2B-nn	79.5"Hx24"Wx36"D (2019x610x914 mm)
Weight, lb (Kg) - Basic Single-Channel	73-67-11-2B-nn	36 (16.3)
	73-67-11-2D-nn	37 (16.7)
	73-67-25-2B-nn	41 (18.6)
Weight, lb (Kg) - Expansion Channel Assy	73-67-11-2B-nn	15 (6.8)
	73-67-11-2D-nn	16 (7.2)
	73-67-25-2B-nn	19 (8.6)

- Notes:
1. -nn in model number represents the number of channels.
 2. These specifications are applicable to 406-512 MHz models.
 3. Models available with 5W/60W loads. Same specifications as 25W and 100W models, except load power.
 4. -MC option reduces maximum number of channels to ten 10-inch or twelve 6.625" channels per rack.
 5. -LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
 6. Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 5.1" (130 mm).

Typical Insertion Loss and Maximum Input Power

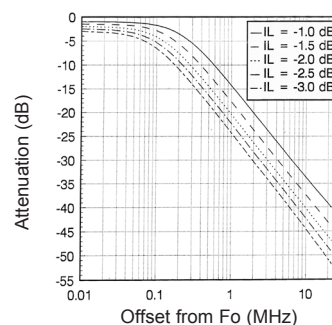
73-67-11-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5 dB	150 W	-2.4	-2.6	-2.9	-3.1
250 kHz	-1.5 dB	150 W	-2.9	-3.8	-4.4	-4.7
150 kHz	-2.0 dB	130 W	-3.6	-4.8	-5.6	-6.0
125 kHz	-2.5 dB	110 W	-4.1	-5.2	-6.0	-6.4

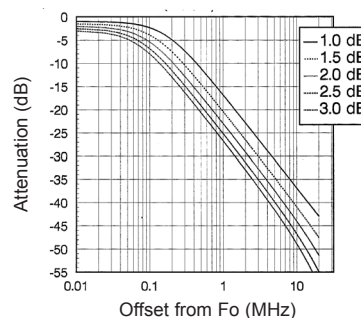
73-67-25-Series Systems (10" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Maximum Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5 dB	150 W	-2.4	-2.5	-2.8	-3.1
250 kHz	-1.5 dB	150 W	-2.7	-3.2	-3.7	-4
125 kHz	-2.0 dB	150 W	-3.4	-4.4	-5.0	-5.5
75 kHz	-2.5 dB	125 W	-4.3	-5.6	-6.6	-7.1

73-67-11 Series Systems
6.625" Diameter Quarterwave, Fo=460 MHz



73-67-25 Series Systems
10" Diameter Diameter Quarterwave, Fo=460 MHz



T-PASS COMBINERS

Technical Specifications

746-960 MHz

The typical channel losses specified here are for equally-spaced channels only. Channel loss may be higher or lower in multicouplers where separation varies from one channel to another. Contact TX RX Systems for T-Pass® channel loss specifications based on your actual system frequency plan.

T-Pass Selectivity vs. Cavity Loss

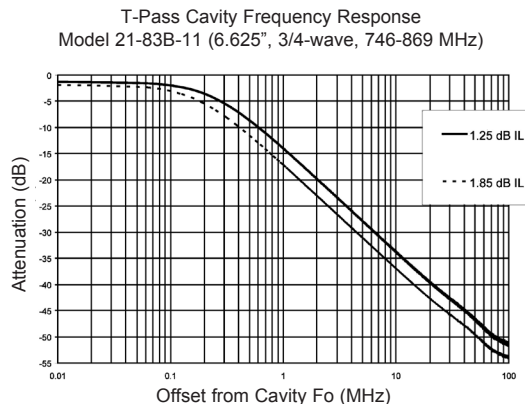
As in the case of bandpass cavity filters, T-Pass® filter selectivity depends on the coefficient of coupling of the cavity loops at resonance. Tighter coupling decreases insertion loss and selectivity; loose coupling increases them. Although 746-869 MHz T-Pass® cavity loops can be set to approximately -0.8 to -3.0 dB insertion loss at resonance, TX RX Systems Inc. uses two "standard" cavity loss settings, -1.25 and -1.80 dB, that produce adequate selectivity for the majority of multicoupler applications in this range. The curves shown here represent the lower-selectivity side of the response curve of a typical 6.625-inch diameter, 3/4-wave 770 MHz T-Pass cavity filter.

Bridging loss in a progressive thru-line T-Pass structure varies in the same general manner as bridging loss in a parallel junction bandpass structure: it decreases as cavity selectivity increases. An optimal cavity loss setting exists that minimizes channel loss under a specified frequency plan and number of channels. See Tech-Aid No. 92002 (Lit. No. D3001D93) for a complete set of selectivity and bridging loss curves for T-Pass cavities from 66-960 MHz.

Typical T-PASS® Channel Insertion Loss

73-83B-11- and 73-90-11-Series Systems (6.625" Cavity Diameter)

Tx-Tx Separation	Cavity Loss	Loss (dB) vs. No. of channels						
		2	3	4	5	8	10	12
1 MHz	-1.25 dB	-2.1	-2.3	-2.4	-2.5	-2.8	-3.0	-3.3
500 kHz	-1.25 dB	-2.3	-2.8	-3.0	-3.2	-3.6	-3.9	-4.1
450 kHz	-1.25 dB	-2.4	-2.9	-3.2	-3.4	-3.9	-4.1	-4.3
250 kHz	-1.80 dB	-3.1	-3.8	-4.1	-4.4	-4.9	-5.2	-5.5



Model Numbers/ Frequency	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	806-960 MHz 806-960 MHz 746-869 MHz 746-869 MHz
Cavity Type and Diameter		3/4-wave, 6.625" (168 mm)
Maximum Continuous Transmit Power @ Tx-Tx Separation	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	150 W @ 450 kHz; 125 W @ 250 kHz 150 W @ 450 kHz; 125 W @ 250 kHz 125 W 125 W
Isolator Load Pwr (Continuous) [Note 3]	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	5W/60 W 5W/100 W 5W/60 W 5W/100 W
Min Tx-Tx Separation @ Cavity Loss		450 kHz @ -1.25 dB; 250 kHz @ -1.8 dB
Channel Insertion Loss		See table below
Typical Tx-Tx Isolation @ Min Separation		80 dB
Typical Antenna - TX Isolation		70 dB
Typical TX Noise Suppression		See curves below
Normal Input Impedance		50 ohms
Maximum Input Return Loss (VSWR)		20 dB (1.22:1)
Temperature Range		-30 to +60°
Connectors, Input & Antenna		N
Mechanical Mounting		Peg Rack®
Mounting Options [Notes 4,5]		MC: 14"x19" rackmount adapter plates, LR: System supplied without Peg Rack®
Maximum Channels Per Rack [Notes 4]		15
Dimensions [Notes 6]	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	65.25"Hx24"Wx20.7"D (1659x610x526mm) 65.25"Hx24"Wx20.7"D (1659x610x526mm) 65.25"Hx24"Wx21.7"D (1659x610x552mm) 65.25"Hx24"Wx21.7"D (1659x610x552mm)
Weight, lb (Kg) - Basic Single-Channel	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	31 (14.0) 32 (14.5) 31 (14.0) 32 (14.5)
Weight, lb (Kg) - Expansion Channel Assy	73-90-11-2C-nn 73-90-11-2D-nn 73-83B-11-2C-nn 73-83B-11-2D-nn	12 (5.4) 13 (5.9) 12 (5.4) 13 (5.9)

- Notes: 1. -nn in model number represents the number of channels.
2. Consult factory on T-Pass® multicouplers for frequencies below 806 MHz or above 960 MHz.
3. Models available with 5W/25W loads. Same specifications as 60W and 100W models, except load power.
4. -MA option reduces maximum number of channels to 12 per rack.
5. -LR systems are tuned and tested on customer frequencies, then disassembled for shipping.
6. Rack depth with cavity tuning rods at maximum frequency. Rod travel is approximately 2.2" (56mm).

T-PASS COMBINERS

Expansion Channels

Expansion Channel Description

A 6.625" or 10" 3-quarterwave T-Pass® cavity filter
 A dual ferrite isolator, with RF loads and coaxial cable for connection to the cavity
 An RF sampler to measure RF power reflected into the isolator output load
 Isolator and channel mounting hardware

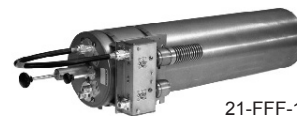
Expansion assemblies for channel 2 and higher are supplied with a thruline of the correct length for the new channel frequency. Starter channels (channel 1, bottom) are supplied with a short circuit on the T-Pass loop.

Ordering Information

To order an expansion channel, specify the following
 Frequency and position of all channels in the system to be expanded
 New channel frequencies
 Transmitter output power on all new channels

T-Pass® Expansion Channel Guide

Tech-Aid No. 93002 (Lit. No. D3011F93) provides a listing of expansion channels by frequency range and isolator load power, as well as diagrams to facilitate selection of the correct channel configuration. Expansion channels are also available with 60-watt loads. Consult with factory.



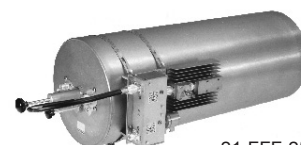
21-FFF-11-2B-T



21-FFF-25-2B-T



21-FFF-11-2D-T



21-FFF-25-2C-T



21-FFF-11-2D-T

T-Pass Multicoupler Model Number	Cavity Diameter	Isolator Power	Isolator Loads	Frequency Range (MHz)	Expansion Channel Model Number	Starter Channel Model Number
73-67-11-xx-Series	6.625"	150 W	See note below	406-430	21-65-11-xx-T	21-65-11-xx-TS
73-67-11-xx-Series	6.625"	150 W	See note below	450-470	21-70-11-xx-T	21-70-11-xx-TS
73-67-11-xx-Series	6.625"	150 W	See note below	470-490	21-71-11-xx-T	21-71-11-xx-TS
73-67-11-xx-Series	6.625"	150 W	See note below	490-512	21-72-11-xx-T	21-72-11-xx-TS
73-67-11-xx-Series	6.625"	150 W	See note below	510-530	21-75-11-xx-T	21-75-11-xx-TS
73-67-25-xx-Series	10"	150 W	See note below	406-430	21-65-25-xx-T	21-65-25-xx-TS
73-67-25-xx-Series	10"	150 W	See note below	450-470	21-70-25-xx-T	21-70-25-xx-TS
73-67-25-xx-Series	10"	150 W	See note below	470-490	21-71-25-xx-T	21-71-25-xx-TS
73-67-25-xx-Series	10"	150 W	See note below	490-512	21-72-25-xx-T	21-72-25-xx-TS
73-67-25-xx-Series	10"	150 W	See note below	510-530	21-75-25-xx-T	21-75-25-xx-TS
73-83B-11-xx-Series	6.625"	150 W	See note below	746-776	21-83C-11-xx-T	21-83C-11-xx-TS
73-83B-11-xx-Series	6.625"	150 W	See note below	851-869	21-83D-11-xx-T	21-83D-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	806-824	21-86A-11-xx-T	21-86A-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	851-869	21-87A-11-xx-T	21-87A-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	870-890	21-93-11-xx-T	21-93-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	929-932	21-96-11-xx-T	21-96-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	935-960	21-95-11-xx-T	21-95-11-xx-TS
73-90-11-xx-Series	6.625"	150 W	See note below	940-960	21-98-11-xx-T	21-98-11-xx-TS

Contact factory on expansion channels for frequencies below 220 or above 250 MHz.

Note: "xx" in model number describes isolator and load configuration: 2B = 5W/25W; 2C = 5W/60W; 2D = 5W/100W

T-PASS COMBINERS

Racks

Bird Technologies Group, TX RX Systems brand, T-Pass racks provide a simple and secure mounting for our expandable cavity multicoupler systems. They are constructed of alodined aluminum except for the steel gussets and cavity support pegs. Shipment is usually made in six sub-assemblies and completed on site. Racks under 66" in height can be shipped UPS. Various rack models are required to accommodate the different cavity diameters and resonator lengths. The chart below provides the principle dimensions for space and mounting considerations.

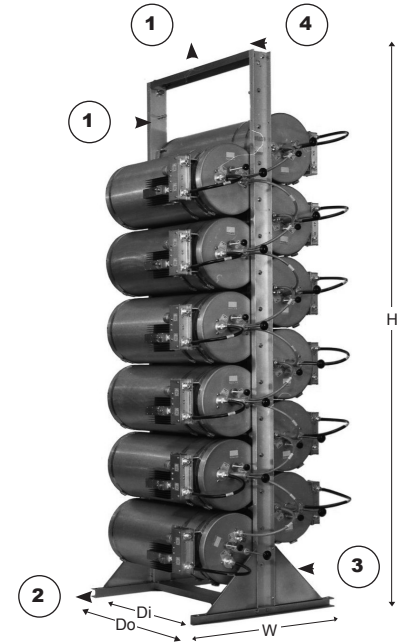
Depending on the frequency band, the tuning rods will extend beyond 9" ~ 12" beyond one of the uprights. For clearance consideration, use $Do + 12"$ for the overall depth.

Aluminum channel 3" x 1" x .125" wall

Solid aluminum bar 1.25" x 1.5"

Triangular steel gusset 9" x 9"

Spare open circuited stub for 800 MHz system, all others are short circuits



NUMBER	DIMENSIONS				CAVITIES		FREQ BAND	Paired 19" Adaptors
	Di (in)	Do (in)	W (in)	H (in)	No.	Dia. (in)		
93-00-01*	26.19	28.69	24.00	79.50	13	10	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-02*	13.31	15.81	24.00	65.25	15	6.625	746-960 MHz	91-00-54 or -99
93-00-04*	11.69	14.19	24.00	65.25	15	6.625	UHF (1/4 λ cavity)	91-00-61
93-00-06	11.69	14.19	24.00	86.50	21	6.625	UHF (1/4 λ cavity)	91-00-61
93-00-08*	26.19	28.69	24.00	86.50	21	6.625	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-09*	26.19	28.69	24.00	65.25	15	6.625	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-10*	13.31	15.81	24.00	86.50	21	6.625	746-960 MHz	91-00-54 or -99
93-00-11*	26.19	28.69	24.00	109.25	19	10	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-13	20.19	22.69	24.00	86.50	21	6.625	806-960 MHz (5/4 λ cavity)	91-00-78
93-00-14*	50.90	53.40	24.00	79.50	13	10	66-88 MHz	consult factory
93-00-17	20.70	23.20	24.00	65.25	15	6.625	806-869 MHz (5/4 λ cavity)	91-00-78
93-00-18*	31.70	34.20	24.00	65.25	15	6.625	118-136 MHz	consult factory
93-00-19*	33.70	36.20	24.00	79.50	13	10	118-136 MHz	consult factory
93-00-21*	19.20	21.70	24.00	79.50	13	10	220-300 MHz	91-00-107
93-00-22*	14.20	16.70	24.00	86.50	21	6.625	746-869 MHz, 300-400 MHz	91-00-100
93-00-23*	27.69	30.19	24.00	86.50	21	6.625	380-420 MHz	91-00-105
93-00-24*	14.20	16.70	24.00	65.25	15	6.625	746-869 MHz, 300-400 MHz	91-00-100
93-00-25*	27.80	30.30	24.00	65.25	15	6.625	380-420 MHz	91-00-105
93-00-26	27.00	30.00	24.00	65.25	12	8	VHF, UHF(3/4 λ cavity)	91-00-106
93-00-27	27.00	30.00	24.00	79.25	16	8	VHF, UHF(3/4 λ cavity)	91-00-106
93-00-28*	26.19	28.69	24.00	75.75	18	6.625	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-29*	26.19	28.69	24.00	75.75	12	10	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-97509	26.19	28.69	24.00	92.50	24	6.625	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-00042	26.19	28.69	24.00	65.25	10	10	VHF, UHF(3/4 λ cavity)	91-00-73
93-00-02453	13.31	15.81	24.00	47.00	6	6.625	746-960 MHz	91-00-54 or -99

NOTES:

- Models with * can also be ordered with reduced number of pegs. Add -LP at the end of the model number. Peg Kits 91-00-PEG, 91-00-PEG1, 91-00-PEG2 available for system expansion. Consult factory for kit selection.
- 19" adaptors may increase rack height and width, or reduce the max number of cavities for those racks. Please consult factory.
- Models with # are for use in 93-00-30 locking cabinet with doors.

STAR JUNCTION COMBINERS/MULTICOUPLERS

VHF Airband

118-137 MHz

CAVITY RECEIVE MULTICOUPLER

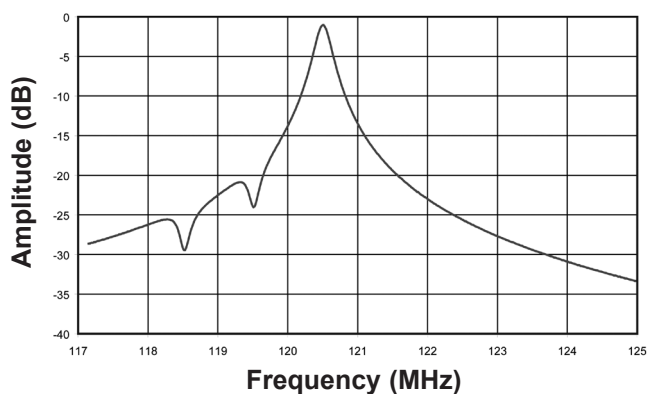
Model Numbers	42-35A-02094-X 42-35A-02280-X	
Cavity Size		8" (203 mm) diameter
Number of Cavities Per Channel	42-35A-02094-X 42-35A-02280-X	1 2
Cavity tuning range		118-137 MHz
Minimum Channel Separation		200 kHz
Cavity Insertion Loss		0.9 dB
Maximum Channel Insertion Loss (When configured as a combiner or multicoupler)	42-35A-02094-X 42-35A-02280-X	2.0 dB 2.5 dB
Isolator Insertion Loss		N/A
Isolation, channel to channel		N/A
Isolation, Antenna to Transmitter		N/A
Maximum Power per channel (at minimum channel separation)		RX only
Maximum Power per channel (at wider channel separation)		RX only

* X at the end of model number indicates number of channels: 2~6 channels

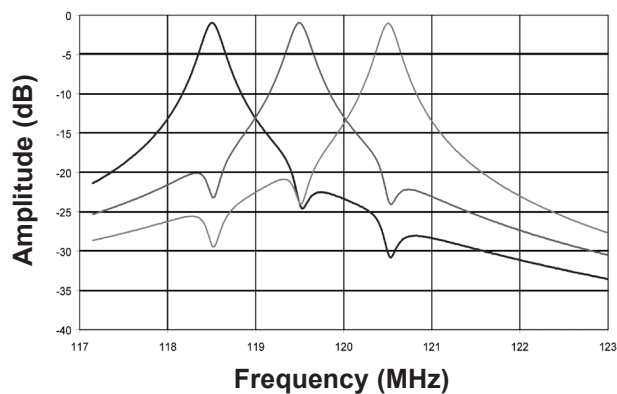
CAVITY TRANSMIT COMBINER

Model Numbers	42-35A-02093-X 42-35A-02279-X	
Cavity Size		8" (203 mm) diameter
Number of Cavities Per Channel	42-35A-02093-X 42-35A-02279-X	1 2
Cavity tuning range		118-137 MHz
Minimum Channel Separation		200 kHz
Cavity Insertion Loss		0.9 dB
Maximum Channel Insertion Loss (When configured as a combiner or multicoupler)	42-35A-02093-X 42-35A-02279-X	2.5 dB 3.0 dB
Isolator Insertion Loss		0.5 dB
Isolation, channel to channel	42-35A-02093-X 42-35A-02279-X	30 dB 35 dB
Isolation, Antenna to Transmitter		25 dB
Maximum Power per channel (at minimum channel separation)		50 W
Maximum Power per channel (at wider channel separation)		80 W typical

Passband for One Channel



Passbands for a 3-channel System



STAR JUNCTION COMBINERS/MULTICOUPLERS

UHF Airband

225-400 MHz

CAVITY RECEIVE MULTICOUPLER

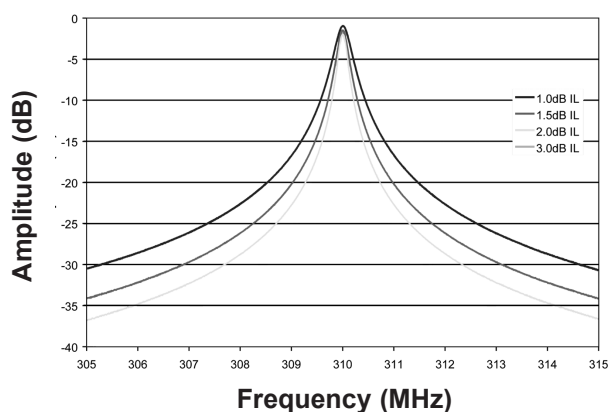
Model Numbers	42-35A-04782-X 42-35A-04786-X	
Cavity Size	8" (203 mm) diameter	
Number of Cavities Per Channel	42-35A-04782-X 1 42-35A-04786-X 2	
Cavity tuning range	225-400 MHz	
Minimum Channel Separation	1 MHz	
Cavity Insertion Loss	0.5-0.7 dB	
Maximum Channel Insertion Loss (When configured as a combiner or multicoupler)	42-35A-04782-X 1.0 dB 42-35A-04786-X 1.5 dB	
Isolator Insertion Loss	N/A	
Isolation, channel to channel	N/A	
Isolation, Antenna to Transmitter	N/A	
Maximum Power per channel (at minimum channel separation)	RX only	

CAVITY TRANSMIT COMBINER

Model Numbers	44-53-04783-X 42-53-04787-X	
Cavity Size	8" diameter	
Number of Cavities Per Channel	44-53-04783-X 1 42-53-04787-X 2	
Cavity tuning range	225-400 MHz	
Minimum Channel Separation	44-53-04783-X 1 MHz 42-53-04787-X 275 kHz	
Cavity Insertion Loss	0.5-0.7 dB	
Maximum Channel Insertion Loss (When configured as a combiner or multicoupler)	44-53-04783-X 2.0 dB 42-53-04787-X 3.0 dB	
Isolator Insertion Loss	1.0 dB	
Isolation, channel to channel	44-53-04783-X 22 dB 42-53-04787-X 27 dB	
Isolation, Antenna to Transmitter	17 dB	
Maximum Power per channel (at minimum channel separation)	100 W	

* X at the end of model number indicates number of channels

Cavity Response Curves



AIRLINE JUNCTION COMBINER

764-869 MHz

CAVITY RECEIVE MULTICOUPLER

Model Numbers	44-fff-99104-XY*
Frequency Range	764-869 MHz
IL per channel	2.0 ~ 5.0 dB typical, depending on freq separation
Min. channel Separation	250 kHz
Max. power per channel	100 Watts
Isolation, TX-TX	45 dB Min
Isolation, Antenna-TX	35 dB Min
Impedance	50 ohms
Return Loss (VSWR)	20 dB (1.22:1)
Cavity Elec. Length	3/4 wavelength
Temperature Range, °C	-30 to + 60
Cavity Size	5.83" square
Number of Cavities	up to 6
Connectors	N
Dimensions	17.5"Hx19"Wx22"D

CAVITY RECEIVE MULTICOUPLER

Model Numbers	44-96-99104-#
Frequency Range	926-960 MHz
IL per channel	2.2 ~ 4.9 dB typical, depending on freq separation
Min. channel Separation	250 kHz
Max. power per channel	100 Watts
Isolation, TX-TX	45 dB Min
Isolation, Antenna-TX	35 dB Min
Impedance	50 ohms
Return Loss (VSWR)	20 dB (1.22:1)
Cavity Elec. Length	3/4 wavelength
Temperature Range, °C	-30 to + 60
Cavity Size	5.83" square
Number of Cavities	up to 6
Connectors	N
Dimensions	17.5"Hx19"Wx22"D

Tx-Tx Separation	Cavity Loss	Loss (dB) vs. No. of channels				
		2	3	4	5	6
1 MHz	1.25	2.0	2.4	2.4	2.4	2.6
500 kHz	1.80	2.8	3.0	3.0	3.2	3.4
250 kHz	2.80	3.5	3.9	4.3	4.7	5.0

Tx-Tx Separation	Cavity Loss	Loss (dB) vs. No. of channels				
		2	3	4	5	6
1 MHz	1.25	2.2	2.3	2.4	2.4	2.5
500 kHz	1.80	2.8	3.0	3.2	3.4	3.5
250 kHz	2.80	3.9	4.3	4.5	4.7	4.9

* fff: Frequency designator: 83B = 764-806 MHz, 86A = 806-869 MHz,
83E = 764-869 MHz
X = number of 700 MHz channels, Y = number of 800 MHz channels
denotes the number of channels

COMPACT CERAMIC COMBINERS

Standard Models

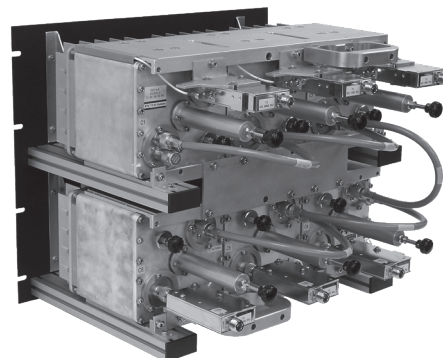
450-512 MHz

Bird Technologies Group, TX RX Systems brand, UHF Ceramic TX Combiner combines up to 6 transmitters onto a single antenna. With a footprint that's more than 50% smaller than comparably performing 10" cavities. This optimizes valuable space for your radio equipment, which in an era of escalating lease costs, makes it the perfect solution for expansion. And because of our modular design, you can purchase in single-channel increments. Plus, it delivers the kind of high performance and minimum interference you've come to expect from Bird®.

Any communications system installation where you need to reduce the number of antennas on a tower

Any communications system designed to minimize tower size and maximize site space

Secured applications that require equipment under lock and key



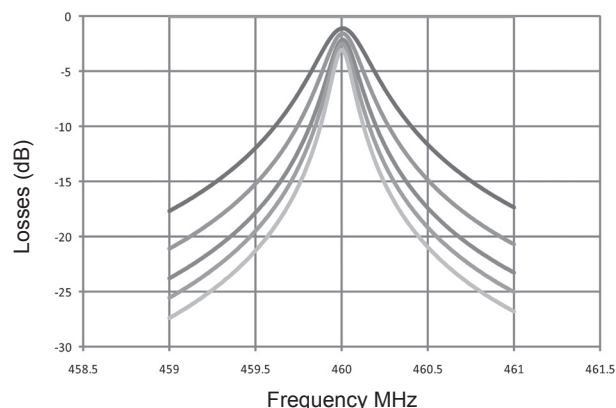
SINGLE CAVITY SPECIFICATIONS

Frequency Range	450-512 MHz
Maximum Power per channel	110 W typical, 125 W max
Cavity Input Return Loss	20 dB typical, 18 dB min
Input / Output Connector	N(F)
Operating Temperature	-10°C to + 55°C
Storage Temperature	-40°C to + 95°C
Size	5.82" x 5.82" x 17 (including tuning rod)

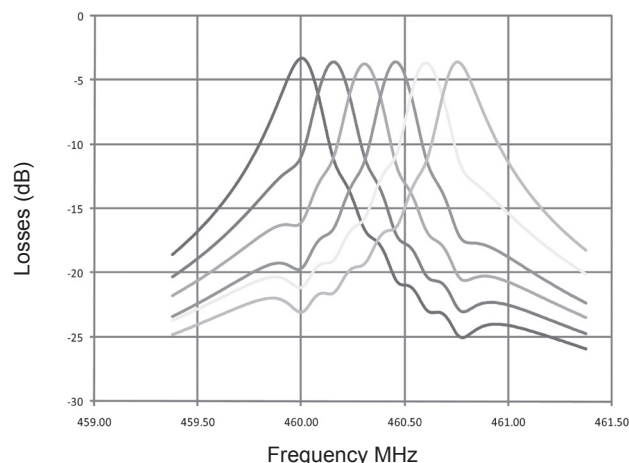
TYPICAL 6 CHANNEL TRANSMIT COMBINER SPECIFICATIONS

Frequency Range	450-512 MHz
Insertion Loss (150 kHz spacing)	3.7 dB typical, 5.3 dB max.
Insertion Loss (250 kHz spacing)	2.9 dB typical, 4.8 dB max.
Insertion Loss (500 kHz spacing)	2.4 dB typical, 4.3 dB max.
Tx to Tx Isolation	>65 dB
Input VSWR	1.2:1 maximum
Average Input Power per Channel (continuous duty)	110W typical, 125 W max
Number of Cavities	6
Height (inches)	17" (9-10 rack units)
Depth (inches)	17"
Width (inches)	18"
19" Rack Mountable	Yes
Weight (lbs)	Approximately 100 lbs.
Input / Output Connector	N(F)
Operating Temperature	-30° C to +55° C
Storage Temperature	-40° C to +95° C

Selectivity (T-Pass Configuration)



Selectivity (T-Pass Configuration)



Model numbers will be determined based on frequency plan.
Please consult factory.

tel: 866.695.4569 fax: 716.549.4772 e: sales@bird-technologies.com

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CONTROL STATION COMBINERS

Low Profile for Space Efficient Installation

Frequency Agile with Predictable Isolation

Analog and Digital Compatible

All passive components lead to superior reliability

Hybrid coupler technology with no need for tuning



Standard Models

132-869 MHz

Bird Technologies Group, TX RX Systems brand, multi-channel combiners provide frequency-agile operation across their entire frequency range. Control Station Combiners may be used to reduce the number of antennas required on a communications site while also ensuring that predictable radio-to-radio isolation is maintained at all times - irrespective of individual radio's Tx or Rx operating mode or antenna isolation characteristics.

Single antenna-port mobiles may be connected to these combiners to provide operation on two-antenna configurations (one Tx and one Rx), or through a duplexer to a single antenna (i.e. Tx/Rx). These capabilities can significantly reduce tower clutter and loading, and simplify cabling installation at Control Center facilities.

Models are available in the 132-150MHz, 150-174MHz, 380-450MHz, 450-520 MHz, and 746-869 MHz, bands in standard configurations for 4, 8, 12, 16, and 32 capacities. Other frequency bands and higher channel capacities are also available upon request.

Optional Duplexer for Standard CSC

Optional duplexers are available in UHF, 700, and 800 MHz bands, (including a tri-band duplexer covering both the 700 and 800 MHz bands), to be used in conjunction with the Control Station Combiners. Please consult factory for technical details.

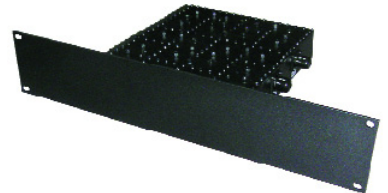
Short-Haul Models

132-960 MHz

Bird Technologies Group, TX RX Systems brand, Short-Haul Control Station Combiners provide fixed isolation between radio units using power attenuators and signal-combining techniques. The result is a constant isolation between radios regardless of the frequencies. Additionally, the higher per channel insertion losses resulted from the use of attenuators protect the receivers at the base site and the Control Stations from being overloaded by the transmitters in close proximity. These capabilities can significantly reduce tower clutter and loading, and simplify cabling installation at Control Center facilities.

Because these Short-Haul Control Station Combiners are specifically designed with higher insertion losses for applications where the control stations and the base sites are less than 5 miles away, careful link budget analysis need to be conducted to verify signal strength and availability before the selection of these Short-Haul models.

Models are available in the 132-174 MHz, 380-520 MHz and 746-960 MHz bands, in standard configurations of 4, 8, 16, 24 and 32 channel capacities. Other frequency bands and higher channel capacities are also available upon request.



CONTROL STATION COMBINERS

Standard Models

132-869 MHz

ELECTRICAL

Frequency Range		132-150 150-174 380-450 746-869
RF Power W	Tx Rx	Per Channel: 50 (50% duty cycle max)* Per Channel: <150 (intermittent) N/A
Minimum Frequency Separation MHz		No limitation for adjacent channel separation. Consult factory for minimum Tx-Rx separation.
Loss dB		See table below
Isolation dB	Tx Rx	TX-Tx: 60 min, 70 typ; Ant - Tx: 60 min, 70 typ Tx-Rx: 60 min, 70 typ; Rx - Rx: 60 min, 70 typ
Return Loss dB		>15
Operating Temperature C°		-10 ~ +50

* Applications with higher duty cycles may require cooling fan option. Contact factory for more info.

MECHANICAL

Finish		Black
Dimensions	H	See table below
mm/inches	W	483 / 19
	D	420 / 16.5
Weight**		See table below
Connectors		N female

**CAUTION: The control station combiner is designed for rack mounting. Due to the weight of the individual units rear support is required for each. A pair of 1/4 x 20" threaded inserts (one on each side of each unit) are provided for this purpose.

Model Numbers	Description	Insertion Loss	Height	Net Weight
43-36-01-04	132-150 MHz, 4 Channel	7.5dB	1RU	22 lbs
43-36-01-08	132-150 MHz, 8 Channel	11dB	3RU	57 lbs
43-36-01-12	132-150 MHz, 12 Channel	14dB	4RU	79 lbs
43-36-01-16	132-150 MHz, 16 Channel	14dB	5RU	101 lbs
43-36-01-32	132-150 MHz, 32 Channel	18dB	11RU	216 lbs
43-37A-01-04	150-174 MHz, 4 Channel	7.5dB	1RU	22 lbs
43-37A-01-08	150-174 MHz, 8 Channel	11dB	3RU	57 lbs
43-37A-01-12	150-174 MHz, 12 Channel	14dB	4RU	79 lbs
43-37A-01-16	150-174 MHz, 16 Channel	14dB	5RU	101 lbs
43-37A-01-32	150-174 MHz, 32 Channel	18dB	11RU	216 lbs
43-57A-01-04	380-450 MHz, 4 Channel	7dB	1RU	22 lbs
43-57A-01-08	380-450 MHz, 8 Channel	11dB	3RU	57 lbs
43-57A-01-12	380-450 MHz, 12 Channel	14dB	4RU	79 lbs
43-57A-01-16	380-450 MHz, 16 Channel	14dB	5RU	101 lbs
43-57A-01-32	380-450 MHz, 32 Channel	17dB	11RU	216 lbs
43-57B-01-04	450-520 MHz, 4 Channel	7dB	1RU	22 lbs
43-57B-01-08	450-520 MHz, 8 Channel	11dB	3RU	57 lbs
43-57B-01-12	450-520 MHz, 12 Channel	14dB	4RU	79 lbs
43-57B-01-16	450-520 MHz, 16 Channel	14dB	5RU	101 lbs
43-57B-01-32	450-520 MHz, 32 Channel	17dB	11RU	216 lbs
43-83G-01-04	746-869 MHz, 4 Channel	8dB	1RU	20 lbs
43-83G-01-08	746-869 MHz, 8 Channel	11.5dB	1RU	22 lbs
43-83G-01-12	746-869 MHz, 12 Channel	15dB	3RU	58 lbs
43-83G-01-16	746-869 MHz, 16 Channel	15dB	3RU	57 lbs
43-83G-01-24	746-869 MHz, 24 Channel	15dB	4RU	79 lbs
43-83G-01-32	746-869 MHz, 32 Channel	18.5dB	5RU	101 lbs

CONTROL STATION COMBINERS

RECOMMENDED OPTIONS: DUPLEXERS

Model Numbers/ Frequency Range	26-83B-10A	762-776 MHz
	26-83G-10A	792-806 MHz
		762-776 MHz
	26-89-A-10A	792-824 MHz
		851-869 MHz
		806-824 MHz
		851-869 MHz
RF Power W	26-83B-10A	14
	26-83G-10A	14
		32
	26-89-A-10A	18
		18
Isolation Loss (dB), max.		1.5
Ripple in band (dB), max.		0.8
Rejection (dB), min.		70 between T/R
Isolation (dB), min.	26-83B-10A	80
	26-83G-10A	70
	26-89-A-10A	80
Return Loss (dB), min.	26-83B-10A	20
	26-83G-10A	18
	26-89-A-10A	20
Impedance (Ω)		50 ohms
Connector		N-Female
Power Rating (W)	26-83B-10A	100
	26-83G-10A	50
	26-89-A-10A	100
Temperature Range, °C		-20 ~ + 70
Size (in/mm)*	26-83B-10A	8.0 (204)x6.0(153)x1.4(36)
	26-83G-10A	10.1(257)x8.2(207)x1.7(44)
	26-89-A-10A	8.0 (204)x6.0(153)x1.4(36)

REFERENCE

Power Conversion Chart & Free Space Path Lost

POWER CONVERSION CHART DBM TO DBW TO WATTS TO VOLTS

dBm	dBw	Watts	Volts (50 Ohm)
80	50	100 kW	2236
75	45	31.6 kW	1257
70	40	10.0 kW	707
65	35	3.16 kW	398
60	30	1000	224
55	25	316	126
50	20	100	70.7
45	15	31.6	39.8
40	10	10.0	22.4
38	8	6.31	17.8
36	6	3.98	14.1
34	4	2.51	11.2
32	2	1.58	8.90
30	0	1.00	7.07
29	-1	0.79	6.30
28	-2	0.63	5.62
27	-3	0.50	5.01
26	-4	0.40	4.46
25	-5	0.32	3.98
24	-6	0.25	3.54
23	-7	0.20	3.16
22	-8	0.16	2.82
21	-9	0.13	2.51
20	-10	0.10	2.24
19	-11	79 mW	1.99

POWER CONVERSION CHART DBM TO DBW TO WATTS TO VOLTS

dBm	dBm	Watts	Volts (50 Ohm)
18	-12	63 mW	1.78
17	-13	50 mW	1.58
16	-14	40 mW	1.41
15	-15	32 mW	1.26
14	-16	25 mW	1.12
13	-17	20 mW	1.00
12	-18	16 mW	0.890
11	-19	13 mW	0.793
10	-20	10 mW	0.707
9	-21	7.9 mW	0.630
8	-22	6.3 mW	0.562
7	-23	5.0 mW	0.501
6	-24	4.0 mW	0.446
5	-25	3.2 mW	0.398
4	-26	2.5 mW	0.354
3	-27	2.0 mW	0.316
2	-28	1.6 mW	0.282
1	-29	1.3 mW	0.251
0	-30	1.0 mW	0.224
-5	-35	316 uW	0.126
-10	-40	100 uW	0.071
-15	-45	31.6 uW	0.040
-20	-50	10 uW	0.022
-25	-55	3.16 uW	0.013
-30	-60	1 uW	0.007

FREE SPACE PATH LOSS ESTIMATOR

PATH LENGTH (MILES)	PATH LOSS IN DB: FREQUENCY IN MHZ						
	50	150	170	450	500	800	900
0.1	50.58	60.12	61.21	69.66	70.58	74.66	75.68
0.25	58.54	68.08	69.17	77.62	78.54	82.62	83.64
0.5	64.56	74.10	75.19	83.64	84.56	88.64	89.66
1	70.58	80.12	81.21	89.66	90.58	94.66	95.68
2	76.60	86.14	87.23	95.68	96.60	100.68	101.71
3	80.12	89.66	90.75	99.21	100.12	104.20	105.23
4	82.62	92.16	93.25	101.71	102.62	106.70	107.73
5	84.56	94.10	95.19	103.64	104.56	108.64	109.66
6	86.14	95.68	96.77	105.23	106.14	110.22	111.25
7	87.48	97.02	98.11	106.57	107.48	111.56	112.59
8	88.64	98.18	99.27	107.73	108.64	112.72	113.75
9	89.66	99.21	100.29	108.75	109.66	113.75	114.77
10	90.58	100.12	101.21	109.66	110.58	114.66	115.68
12	92.16	101.71	102.79	111.25	112.16	116.25	117.27
14	93.50	103.04	104.13	112.59	113.50	117.58	118.61
16	94.66	104.20	105.29	113.75	114.66	118.74	119.77
18	95.68	105.23	106.31	114.77	115.68	119.77	120.79
20	96.60	106.14	107.23	115.68	116.60	120.68	121.71
30	100.12	109.66	110.75	119.21	120.12	124.20	125.23
40	102.62	112.16	113.25	121.71	122.62	126.70	127.73
50	104.56	114.10	115.19	123.64	124.56	128.64	129.66

FORMULA: Path Loss (dB) = 36.6 + 20 log (MHz) + 20 log (miles)

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LOUD AND CLEAR.

Bird® Technologies Group (BTG) is a global, innovative supplier of RF products, systems, services and educational solutions. Combining the industry leading brands of both Bird Electronic and TX RX Systems in one company reinforces the BTG commitment to providing RF Measurement and Management in Your World.

Our portfolio includes hardware, software, components and services. We offer these innovative products and services through our industry leading product line brands, Bird Electronic Corp and TX RX Systems. We provide test instruments that are highly accurate, rugged and easy to use. Industry leading components and products such as site analyzers, wattmeters, digital sensors, samplers, antennas, signal boosters, and tower mounted amplifiers. Furthermore, we offer dependable engineering, calibration and educational services for land mobile radio, cellular, semiconductor, broadcast, medical, military and government applications.

All BTG products can be serviced and calibrated by the Bird Service Center (BSC). BSC provides a full range of service and support. With over 130 years of combined product and calibration experience, our service technicians and product experts offer reliable service and customer care. Bird Service Centers and Service Partners are located World Wide providing a full range of service and support for your Bird Products.

Catalogs offered by Bird Technologies Group

(To view or download go to www.bird-technologies.com)

Bird General Catalog

RF & Microwave Components Catalog

Transmit Combiners Catalog

Cavity Filters & Duplexers Catalog

Antennas Catalog

Tower Top Amplifiers, Receiver Multicouplers & Preselectors Catalog

Isolators & Loads Catalog

In-Building Coverage Catalog

(Signal Boosters & Accessories)



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