

# **TRANSMITTER COMBINERS**



The growing need to combine multiple frequencies into one antenna due to increased radio usage and crowded transmission sites is now a fact of life. To meet this need, we offer a comprehensive line of cavity-ferrite and hybrid-ferrite types of transmitter combiners.

**Cavity-Ferrite Combiners:**

This is the most popular type of combiners. It is usually comprised of bandpass cavities with a ferrite isolator in each channel for transmitter intermodulation protection.

The advantages are high isolation and low insertion loss for moderately close channel spacing. They are easily field expandable, making them popular in trunking and cellular systems.

**Hybrid-Ferrite Combiners:**

When the channel spacings are too close for the cavity response curve of the cavity-ferrite combiner to provide adequate isolation, a hybrid-ferrite combiner is used.

These combiners have no minimum separation specifications and can even be used to combine two transmitters operating on the same frequency.

They provide high isolation between transmitters and are compact and easily field expandable.

# TRANSMITTER COMBINERS



# Features

- ◆ Includes low loss single or dual-stage isolator and high "Q" 3/4 wave cavity for close channel separation
- ◆ Minimal frequency separation of 250 KHz or greater
- ◆ Available in 2 to 5 channel configurations
- ◆ Easily expandable to 20 channels with optional expansion kits
- ◆ Low loss double shielded cable to ensure high isolation between channels
- ◆ Special harness & loop design allowing for easy field expansion with minimal downtime and test equipment
- ◆ Fully temperature compensated to assure consistent performance
- ◆ All models are 19 in. rack mountable
- ◆ Available in other frequency ranges from 132 to 512 MHz

Please consult our representative for additional information.

# Cavity Ferrite Transmitter Combiners

CFC Series

806-960 MHz

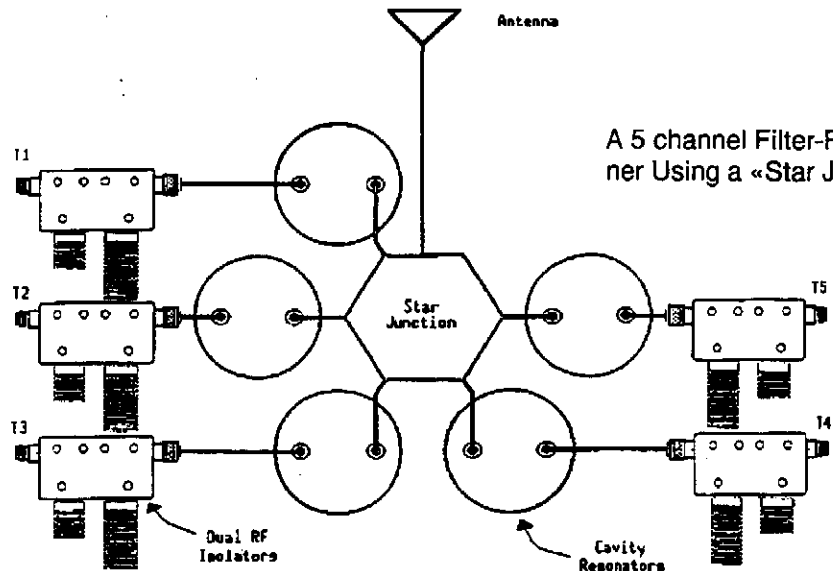
*The CFC Series can couple multiple transmitters to one antenna when frequency separation is at least 250 KHz or greater. They provide maximum "Q", excellent heat transfer and the lowest possible insertion loss.*

**Specifications:**

	CFC-8012	CFC-8013	CFC-8014	CFC-8015
	CFC-8022	CFC-8023	CFC-8024	CFC-8025
Frequency Range:	MHz 806-960			
Channel Spacing:	MHz 0.25 or more			
Insertion Loss:	dB			
	2 channels	3 channels	4 channels	5 channels
at 0.25 MHz (Note 1)	3.2	3.5	3.7	3.9
at 0.50 MHz (Note 1)	2.4	2.7	2.8	3.0
at 1.00 MHz (Note 1)	1.9	2.1	2.3	2.5
Isolation:	dB			
Antenna to Tx	70+ (dual isolator)			
Tx to Tx	80 to 100			
Power Input:	watts 150 (continuous duty)			
VSWR: (Note 2)	1.15:1 or better, all ports			
Temperature Range:	Deg. -30 C to +65 C			

Note 1. Losses indicated are for dual isolators. Subtract 0.2 dB for single stage isolator.

Note 2. VSWR is referenced to 50 ohms.



A 5 channel Filter-Ferrite Combiner Using a «Star Junction».



# Hybrid-Ferrite Transmitter Combiners

HFC Series

132-960 MHz

## Features

- ◆ Allows to combine multiple close spaced transmitters to maximize use of tower space & reduce costs.
- ◆ No minimal channel separation - can be used to combine two transmitters on same frequency.
- ◆ High isolation to minimize the possibility of intermodulation.
- ◆ Low VSWR - better than 1.15:1 at all inputs & outputs
- ◆ Field expandable & retunable.
- ◆ Compact design
- ◆ Modular construction which simplifies on-site expansion

*This series of combiners are designed to maximize use of tower space and reduce costs by coupling multiple close-spaced transmitters into one antenna. They are highly compact, modular and accomodate close channel spacing with very high isolation*

Model	Band MHz	No. Xmtrs	Input insertion		Isolation		Dimensions mm
			Pwr watt	Loss dB	TX - TX dB	ANT -TX dB	
HFC-1512	132-174	2	125	3.7 <sup>1</sup>	75	35	89x483x254
HFC-1522	132-174	2	125	3.9 <sup>2</sup>	100+	70+	89x483x254
HFC-1514	132-174	4	125	6.7 <sup>1</sup>	75	38	267x483x254
HFC-1524	132-174	4	125	6.9 <sup>2</sup>	100+	70+	267x483x254
HFC-4512	406-512	2	125	3.7 <sup>1</sup>	75	35	89x483x254
HFC-4522	406-512	2	125	3.9 <sup>2</sup>	100+	70+	89x483x254
HFC-4514	406-512	4	125	6.7 <sup>1</sup>	75	38	267x483x254
HFC-4524	406-512	4	125	6.9 <sup>2</sup>	100+	70+	267x483x254
HFC-8012	806-960	2	125	3.7 <sup>1</sup>	75	35	89x483x254
HFC-8022	806-960	2	125	3.9 <sup>2</sup>	100+	70+	89x483x254
HFC-8014	806-960	4	125	6.7 <sup>1</sup>	75	38	267x483x254
HFC-8024	806-960	4	125	6.9 <sup>2</sup>	100+	70+	267x483x254

<sup>1</sup> Includes per channel losses for single junction isolators.

<sup>2</sup> Includes per channel losses for dual junction isolators.

Losses on four channel models include an additional hybrid coupler.

Contact the factory for the availability of larger scale hybrid combiners.

