

ACT27xxJ2 and DBNXTL27xx Transmitter Combiner

5-Channel Models: ACT2705J2, DBNXTL2705
10-Channel Models: ACT2710J2, DBNXTL2710

15-Channel Model: ACT2715J2
20-Channel Model: ACT2720J2

Installation and Tuning Instructions

PRODUCT DESCRIPTION

Transmitter combiners allow more than one transmitter to operate on a single antenna. By combining transmitters, tower space is conserved and the expense of multiple feed lines is reduced.

The ACT27xxJ2 and DBNXTL27xx combiners employ waveguide technology, which also conserves rack space. In addition, the DBNXTL27xx models save even more rack space because the load assembly can be mounted behind the combiner; thereby, taking up one less rack slot.

The specifications are equal to, or better than, those of conventional coaxial cavity combiners. The unique invar alloy used in the construction of this combiner allows a wide ambient temperature range (-30° to +60° C) without degradation or the need for compensation due to thermal expansion. All RF contact parts are either silver soldered or silver plated for assured conductivity and reliability.

The combiner is factory-tuned and services the full range of frequencies for which it was designed. Field tuning is easily accomplished with an in-line wattmeter, a hex wrench (if shaft locks are provided) and a screwdriver. The applicable specifications for 1MHz channel separation can be closely approximated as follows:

Insertion Loss: 1.9dB maximum for the first three (3) channels plus 0.1dB for each additional channel.

Isolation (transmitter to transmitter): The basic combiner provides a minimum of 10 dB isolation. An additional 25dB isolation, antenna-to-transmitter and transmitter-to transmitter, is realized for each isolator junction used.

Input VSWR: Although field tuning can usually eliminate VSWR problems, more than 1.25:1 should never exist providing the antenna VSWR is less than 1.5:1.

INSTALLATION

A well-planned installation will not only result in a neat appearance but will ease future service needs and reduce the chance of failure and RF interference.

1. To reduce cable loss, mount the combiner as close to the transmitters as possible. The combiner(s) may be

mounted in any position. Be sure to select a location that will allow cables to be safe from possible damage due to the opening of cabinet doors, persons walking by, etc.

2. To reduce RF and reception noise, a super flexible cable is recommended for all on-site interconnections.
3. Route the antenna cables into the bottom of cabinets for maximum lightning protection.

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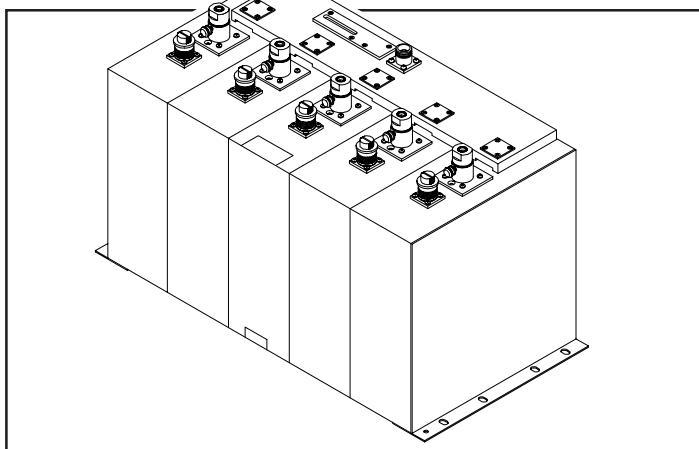


Figure 1 - ACT2705J2 / DBNXTL2705 Tx Combiner

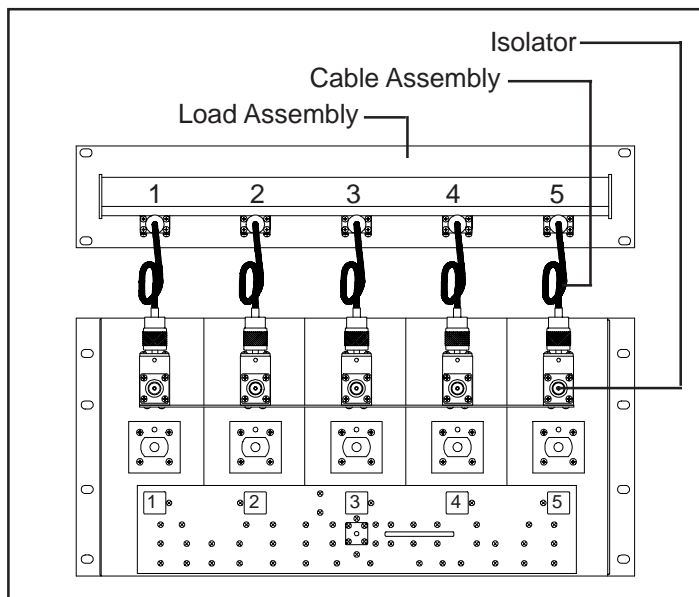


Figure 2 - ACT2705J2 / DBNXTL2705 Tx Combiner, Top View

Warning!

Installation of any antenna or antenna product near power lines is **dangerous**.
For your safety, follow proper installation procedures.



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4. Follow good grounding and other lightning protection practices. Consult the current National Electrical Code and local codes for additional information on lightning protection.
5. Mount the combiner in the desired location. Allow accessibility to the tuning mechanisms and allow space for the isolators as well as their associated loads.
6. Fabricate the interconnect cables as required. Each connector must be properly installed and secured to ensure trouble-free performance.

RETUNING TO DIFFERENT FREQUENCIES

This procedure is to be followed if frequencies are changed; it is valid only if the channel spacing is not altered.

1. Remove all isolators from the combiner. (Reflected power must be measured during this procedure and proper measurement is not possible with the isolators installed.)
2. If instrumentation such as a spectrum analyzer and a service monitor or tracking generator is available, connect them to the combiner, one port at a time. Leave unused ports unterminated. Loosen the shaft lock (if provided) on each cavity and adjust them for minimum insertion loss at the new frequency(s).
3. If instrumentation in step 2 above is not available, transmitters that have been tuned to the new frequencies may be used. *Caution:* Care must be used to avoid long high-power transmissions into untuned cavities. *Failure to observe this caution may cause damage to the combiners and/or the transmitters.* Connect each transmitter to its cavity and connect the in-line wattmeter to the output of the combiner. Loosen all of the shaft locks (if provided) and tune each cavity for maximum output. Remember, keep transmit times short.
4. Reinstall the isolators, then perform the final adjustments and tuning as outlined in the next section.

FINAL ADJUSTMENT AND TUNING

If the combiner is to be used on the factory-tuned frequencies, only minor fine-tuning should be required. A bi-directional in-line wattmeter is needed.

1. Check the reflected power from the antenna to ensure that the antenna and the feed line are functioning correctly.
2. Switch the wattmeter to the forward power position.

3. Loosen the shaft lock (if provided) on each cavity tuning mechanism. Do not adjust any of the connector screws or the screws around the small lever to the right of the output connector. If these screws are adjusted, the coupling adjustments made at the factory will be destroyed. It will be necessary to return the combiner to the factory to restore it to proper specifications.
4. Key the transmitter and gently rock the tuning screw back and forth on each corresponding cavity for maximum output power.
5. To ensure that the adjustments do not change while the shaft locks are tightened, carefully tighten each shaft lock (if provided) while its transmitter is on the air.
6. The following information should be recorded for future reference: the forward and reflected power to the antenna for each channel and the forward power from each transmitter to the combiner. This information should be left at the station location for future reference to assist in verifying proper operation.

FINAL INSTALLATION

1. Observe the labeling on the isolators to ensure proper connection:
 - The arrow must point away from the transmitter
 - "IN" is the connection from the transmitter
 - "OUT" is the connection that goes toward the Combiner / Duplexer / Antenna, as applicable.

Caution: Isolators with three connections require that external primary loads be connected *before* power is applied to the system. If applicable, the appropriate cables are supplied for these connections. Primary loads must be able to handle full transmitter output on the channel used.
2. To provide mechanical support, a support strap and its mounting screws, which may be attached to the isolator, may be supplied.
3. Fabricate the interconnect cables as required. A minimum amount of tuning will be necessary after each combiner cavity is connected to its respective transmitter. (See above for tuning instructions.) Each connector must be properly installed and secured to achieve best performance and to avoid failure or noise generation.
4. Make sure all mounting hardware and cable connections are securely tightened. Loose hardware or cable connections can be a source of RF noise.

