



6644870

## 4424 and 4425 Wideband Repeat Coils

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### 1. general description

1.01 Tellabs' 4424 and 4425 Wideband Repeat Coil modules provide transformer isolation, impedance matching and simplex lead derivation for use in wideband, voice frequency transmission facilities (normally transmitting am or fm radio programming or tv audio) with a bandwidth requirement of 50 to 15,000Hz.

1.02 Frequency response of the 4424 and 4425 is nominally flat ( $\pm 0.5$ dB re 1000Hz) from 50Hz to 15kHz.

1.03 The 4424 is a single-circuit module while the 4425 incorporates two identical, independent circuits into one module. Both are Type 10 modules.

1.04 Option switches on the 4424 and 4425 afford a choice of nominal 600 or 150 ohm terminating impedance at both ports (i.e., on both terminal and facility sides) of each Repeat Coil circuit.

1.05 A simplex lead is derived toward each port of the 4424 and 4425 only when that port is optioned for 600 ohm terminating impedance.

1.06 The 4424 and 4425 each mount in one position of the Tellabs Type 10 Shelf, versions of which are available for relay rack and apparatus case installation. In relay rack applications, up to 12 modules may be mounted across a 19 inch rack, while up to 14 modules may be mounted across a 23 inch rack. In either case, 6 inches of vertical rack space is utilized.

1.07 Because of common connector pin assignments, the 4424 (single) Wideband Repeat Coil may be provided in lieu of a 4008 Program Amplifier in certain 248 Program Amplifier Assemblies. See paragraph 2.05.

### 2. application

2.01 The 4424 and 4425 Wideband Repeat Coil modules are used almost exclusively in program circuits transmitting either am, fm, or fm stereo radio or television audio broadcasts. Terminating the circuit with impedance matching and transformer isolation, the specially designed transformers of the 4424 and 4425 accommodate the 50Hz to 15kHz frequency range of radio programming. (In most applications involving the 4424 or 4425, amplification and amplitude equalization are provided at the opposite end of the circuit from the Repeat Coil).

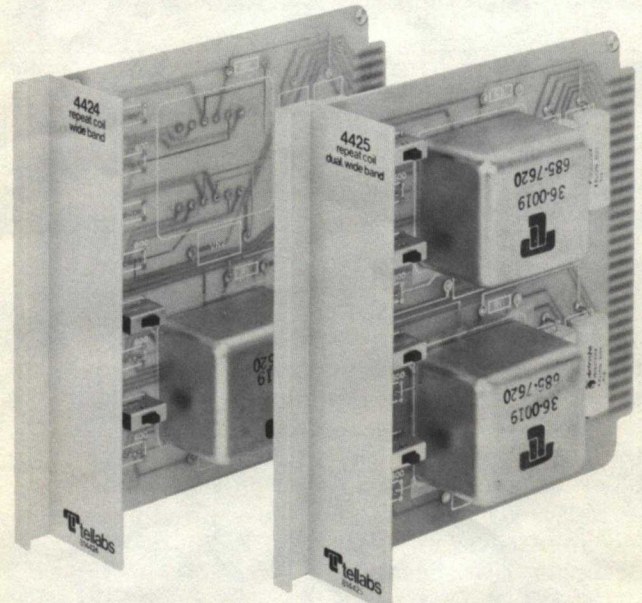


figure 1. 4424 and 4425 Wideband Repeat Coils

2.02 The single-circuit module (4424) is typically used in monaural broadcast applications, while the dual-circuit module (4425) may be conveniently applied to facilities transmitting stereo programming. In applications serving multiple program channels, the 4425 provides greater density.

2.03 The 600 ohm impedance terminations on both terminal and facility sides of the 4424 and 4425 are compatible with the impedance characteristics of most terminal equipment and of the non-loaded cable. Either module may, in addition, be switch-optioned to provide a 150 ohm impedance termination. (See paragraph 3.03.) The 150 ohm option may be used, for example, to interface a passive program equalizer local to the Repeat Coil.

2.04 When each port of a Repeat Coil circuit is optioned for 600 ohm impedance termination, a simplex lead is derived toward that port. These simplex leads may be used to provide a path for sealing current or to provide dc powering to a remote location.

2.05 Pinouts on the single circuit of the 4424 or on circuit 1 of the 4425 are identical to those of the 4008 Program Amplifier. A Wideband Repeat Coil may, therefore, be substituted for a 4008 (without rewiring) in prewired assemblies or shelves when only termination, and not amplification or equalization, is required in the circuit.

### 3. installation inspection

3.01 The 4424 and 4425 Wideband Repeat Coil modules should be visually inspected upon arrival in order to find possible damage incurred during

shipment. If damage is noted, a claim should immediately be filed with the carrier.

**mounting and installer connections**

3.02 Each module mounts in one position of the Tellabs Type 10 Mounting Shelf. The module plugs physically and electrically into a 56-pin connector at the rear of the Type 10 Shelf. Before making any connections to the Shelf, make sure that power is off and modules are removed. Table 1 lists external connections to the modules. Pin numbers are found on the body of the 56-pin connector.

connect	to pin	connect	to pin
<b>[circuit 1 — 4424 and 4425]</b>			
side 1 Tip . . . . .	5	side 1 Tip . . . . .	55
side 1 Ring . . . . .	15	side 1 Ring . . . . .	49
side 1 simplex lead . . . . .	1	side 1 simplex lead . . . . .	51
side 2 Tip . . . . .	7	side 2 Tip . . . . .	41
side 2 Ring . . . . .	13	side 2 Ring . . . . .	47
side 2 simplex lead . . . . .	9	side 2 simplex lead . . . . .	43
<b>[circuit 2 — 4425 only]</b>			

table 1. External connections

**options and alignment**

3.03 No alignment of the 4424 and 4425 is required. To option any port of the 4424 or 4425 for 600 or 150 ohm impedance termination, set the option switch associated with that port to the 600 or 150 position, respectively. On the 4424, the terminating impedance on side 1 of the circuit (see block diagram below) is selected via switch S1 and on side 2 via switch S2. On the 4425, the terminating impedance on side 1 of circuit 1 is selected via switch S3 and on side 2 of circuit 1 via switch S4. The terminating impedance on side 1 of circuit 2 is selected via switch S3 and on side 2 of circuit 2 via switch S4. Switch locations are shown in figure 2.

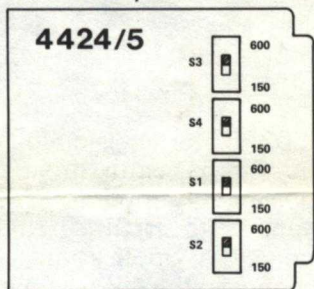
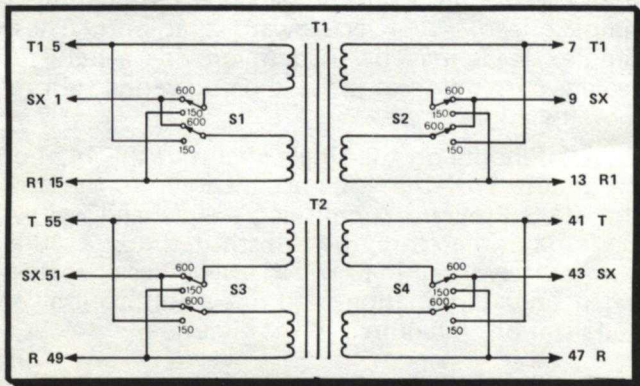


figure 2. Switch locations

**4. circuit description**

4.01 Each Wideband Repeat Coil circuit (one on the 4424, two on the 4425) consists of a dual-winding, bifilar-wound, special wideband transformer that is tapped to derive a simplex lead toward each port when that port is optioned for 600 ohm impedance termination. When a port is optioned for 150 ohm impedance termination, the two bifilar windings on that side of the transformer are placed in parallel via the impedance option switch.



5. block diagram

**6. specifications**

**frequency response**  
±0.5dB re 1000Hz level,  
50Hz to 15kHz

**insertion loss**  
0.5±0.2dB at 1000Hz

**impedance**

600 ohms (CT) to 600 ohms (CT) (1:1) or, via switch option, 600 ohms to 150 ohms (not CT)

**reflected impedance**

600 ohms ±10%, 50Hz to 15kHz, with a secondary terminated in 600 ohms ±1%

**echo return loss (ERL)**

20dB minimum

**maximum input level**

+20dBm

**unbalanced dc winding current**

no more than 5mA unbalanced current in either winding

**maximum isolation between windings**

50V rms at 60Hz

**dc resistance**

30 ohms maximum, primary and secondary windings

**longitudinal balance**

60dB minimum, 100Hz to 15kHz (with CT grounded)

**operating environment**

-40° to 140° F (-40° to +60° C), humidity to 95% (no condensation)

**dimensions**

5.58 inches (14.17cm) high  
1.42 inches (3.61cm) wide  
5.96 inches (15.14cm) deep

**weight**

4424: 13 oz. (0.369kg)  
4425: 1 lb. 7 oz. (0.625kg)

**mounting**

one position of Tellabs Type 10 (or equivalent) Mounting Shelf or one position of Tellabs Type 248 Assembly

**7. testing and troubleshooting**

7.01 To verify proper operation of the 4424 or 4425 Wideband Repeat Coil modules, insert a 1000Hz tone at 1dBm into one side of the Wideband Repeat Coil and measure output at the other side. The output should be within specifications for insertion loss at 1000Hz and at other frequencies within the specified frequency response range.

7.02 If the specified output is not measured, verify the correct positioning of all option switches. Verify wiring. If these points are verified and the module still does not meet specs, substitute a new module and retest. If the substitute module functions properly, the original module should be considered defective.

7.03 If a 4424 or 4425 is diagnosed as defective, the situation may be remedied by either replacement or repair and return. Because it is the more expedient method, the replacement procedure should be followed whenever time is a critical factor (e.g., service outages, etc.).

**replacement**

7.04 If a defective 4424 or 4425 is encountered, notify Tellabs directly via telephone [(312) 969-8800], twx [910-695-3530], or letter [see below]. Notification should include all relevant information, including the 8X442X part number (from which we can determine the Issue of the 442X in question). Upon notification, we shall ship a replacement 442X to you. If the Warranty date of the 442X has not elapsed, the replacement module will be shipped at no charge. Package the defective 442X in the replacement module's carton; sign the packing list included with the replacement 442X and enclose it with the defective module (this is your return authorization); affix the preaddressed label(s) provided with the replacement module to the carton(s) being returned; and ship the equipment prepaid to Tellabs.

**repair and return**

7.05 Return the defective 442X, shipment prepaid, to:  
Tellabs Incorporated  
4951 Indiana Avenue  
Lisle, Illinois 60532—Attn: repair and return dept.  
Enclose an explanation of the module's malfunction. Follow your company's standard procedure with respect to administrative paperwork. Tellabs will repair the module and ship it back to you. If the module is in Warranty, no invoice will be issued.