

**50-KILOBIT WIDEBAND LOOP  
1 THROUGH 50 KHZ  
WLR-5 REPEATER  
INSTALLATION AND CONNECTION**

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requires five circuit packs: a regulator, a preamplifier, an amplifier, a control unit or plug, and a power selector. See Table A for plug-in circuit packs required by locations.

**1.04** The repeaters are powered by a local battery or remotely powered by sending simplex current over the cable pairs. Each long loop requires a customer and terminal repeater but when the loop loss is greater than 30 dB, an intermediate repeater is required. Pilot regulation is used to compensate for variations in loop loss due to ambient temperature changes. Very short loops require a terminal repeater only.

**1.05** No special tools are required for installation of the WLR-5 repeater.

**1. GENERAL**

**1.01** This section provides the installation and connection information for the WLR-5 repeater located on a group bandwidth local loop. Information is provided for the three locations where repeaters are utilized, as follows: at the customer premises adjacent to the data station, at the central office (terminal) adjacent to or in the Wideband Service Bay, and at intermediate locations along the loop. This section is presented with the assumption that the mounting enclosures (cabinet or apparatus case) have been installed.

**1.02** This section is reissued to include installation and connection information for customer and central office locations. Since this issue constitutes a general revision, arrows normally used to indicate changes have been omitted.

**1.03** A full duplex repeater contains ten plug-in circuit packs. Each direction of transmission

**2. PRECAUTIONS**

**Pole Mounted Repeaters**

**2.01** *Always* relieve the pressure on the 470A apparatus case before loosening the V-band clamp prior to removing the container.

**2.02** *Never* use an apparatus case as a step.

**2.03** After removing the container, install a new O-ring (Part No. P48D378), if required, before replacing the container. The gasketed surface must be free of dirt to allow a pressurized seal.

**2.04** After replacing the container, apply air pressure to the case and test the seal for leaks with a pressure-test solution.

**2.05** The case clamp and chain assembly is a restraining device to prevent the container from being blown off when the V-band clamp is

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

TABLE A

## WLR-5 REPEATER COMPONENTS BY LOCATION

LOCATION	PWR	REG	DIRECTION 1					DIRECTION 2					
			J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	
TERMINAL	LOC	PILOT	AE	AD	AC	AG	AJL2	AF	AL	AC	AH	AJL2	
		NON	AF *	AD	AC	AM	AJL1	AF	AM	AC	AM	AJL1	
	REM	PILOT	AE	AD	AC	AG	AKL2	AF	AL	AC	AH	AKL2	
		NON	AF *	AD	AC	AM	AKL1	AF	AM	AC	AM	AKL1	
	INTERMEDIATE †	LOC	PILOT	AE	AD	AC	AG	AJL1	AE	AD	AC	AG	AJL1
			NON	AF	AD	AC	AM	AJL1	AF	AD	AC	AM	AJL1
REM		PILOT	AE	AD	AC	AG	AKL1	AE	AD	AC	AG	AKL1	
		NON	AF	AD	AC	AM	AKL1	AF	AD	AC	AM	AKL1	
CUSTOMER	LOC	PILOT	AF	AL	AC	AH	AJL2	AE	AD	AC	AG	AJL2	
		NON	AF *	AM	AC	AM	AJL1	AF	AD	AC	AM	AJL1	
	REM	PILOT	AF	AL	AC	AH	AKL2	AE	AD	AC	AG	AKL2	
		NON	AF *	AM	AC	AM	AKL1	AF	AD	AC	AM	AKL1	
SHORT LOOP TERMINAL	LOC	NON	AF	AD	AC	AM	AJL1	AF	AD	AC	AM	AJL1	

Note: The suffixes in this table pertain to J70171.

\* Or J70171BC Low Frequency Compensated Regulator

† ED-73208-50 Spacer

loosened before apparatus case air pressure is reduced. This restraining device should always be in place when the case is pressurized.

**2.06** Growth of brush and grass or the accumulation of rubbish around the base of a cabinet should be controlled to prevent damage by fire. Also, ventilation of the cabinet may be blocked and result in equipment overheating.

### 3. INSTALLATION AND CONNECTIONS

#### A. Customer or Terminal Location

**3.01** The J70171AA repeater shelf (Fig. 1) is a 23-inch shelf for bay mounting at customer, intermediate, or terminal locations. The repeater may be equipped with current adjusting potentiometers (shown) for sending simplex power over the cable pairs.

**3.02** For orientation purposes, the two directions (inputs and outputs) of the repeater are A and B. Direction 1 goes from A to B and A may represent the customer location and B the central office location. The remotely powered repeater may receive power from A and send to B, receive power from B and send to A, or receive power

from one side and loop sealing current from the other side. These connections are made by S1 switch on both remote power selectors.

**3.03** The repeaters may be powered from a -48 volt battery using local power selectors. All battery and strapping connections are made on terminal strip (TSA) at the rear of the repeater shelf (Table B). The power connections supply -48, +130, -48 and +130, or -130 and +130 dc volts, as required, to send simplex current over the cable (Table C). Insure that the polarity check in Section 314-643-500 has been performed prior to powering the repeater.

#### B. Intermediate Location

**3.04** Two types of weathertight enclosures may be used when the WLR-5 is at the intermediate location. A KS-14296 L5 cabinet is part of a J70171A repeater cabinet assembly and a 470A apparatus case is part of a J70171B apparatus case. The apparatus case is pressurized whereas the cabinet is not. The enclosures provide aerial or underground protection for the repeater. The intermediate repeater is either locally powered or remotely powered from the customer or central office location. The 19- or 23-inch shelf repeater



Fig. 1—J70171AA Repeater Shelf

TABLE B

## LOCAL POWER CONNECTIONS

POWER CONDITION	VOLTAGE		CONNECT PINS OF TSA	CONNECTIONS REQUIRED
	POS BAT.	NEG BAT.		
Send Power to A	+130	GRD	15-14, 13-8	One Per Station
	+130	- 48	15-14, 13-9	
	+130	-130	15-14, 13-12	
Send Sealing Current to A	GRD	- 48	10-8, 13-9	
Receive Loop Sealing Current From A			10-11	One Per Station
Send Power to B	+130	GRD	1-14, 3-8	One Per Station
	+130	- 48	1-14, 3-9	
	+130	-130	1-14, 3-12	
Send Sealing Current to B	GRD	- 48	6-8, 3-9	
Receive Loop Sealing Current From B			2-6	One Per Station

*Note:* Use 0.180 ampere fuses (code 70E) in the  $\pm 130$  vdc power leads when simplex current is fed in only one direction. Use 0.5 ampere fuses (code 70G) when current is fed in both directions.

TABLE C

## REMOTE POWER CONNECTIONS

POWER CONDITION	SWITCH POSITION FOR UNIT IN LOCATION	
	1-J5	2-J10
Receive DC PWR from A Send DC PWR to B	T (THRU)	T (THRU)
Receive DC PWR from B Send DC PWR to A	T (THRU)	T (THRU)
Receive DC PWR from A Loop Sealing Current from B	T (THRU)	L (LOOP)
Receive DC PWR from B Loop Sealing Current from A	L (LOOP)	T (THRU)

may be used at intermediate central office locations. For information, refer to 3.01 for the 23-inch shelf and to 3.08 for the 19-inch shelf.

#### J70171B Apparatus Case

**3.05** The J70171B apparatus case is intended for either pole or manhole mountings and contains one full duplex repeater. An aluminum framework inside the case provides four equal compartments. The two upper compartments accommodate transmission direction 1, side A to B. The two lower compartments accommodate direction 2, side B to A. Each direction (two compartments) consists of eight plug-in circuit packs. Five circuit packs are operational and the other three are spacers (ED-73208-50). The framework is mounted in a watertight, hermetically sealed 470-type apparatus case as shown in Fig. 2.

**3.06** Furnished as part of the apparatus case is a 25-foot length of CA1984 stub cable. The cable contains 16 pairs of 24-gauge polyvinyl-chloride (PVC) insulated conductors in a PVC jacket. The jacket is covered with a lead shield. Five pairs of the stub cable are terminated on the lightning protector terminal block. Each conductor is connected to a terminal with 2A1A protector unit which limits the voltage to 600 volts to ground.

**3.07** Figure 3 shows the stub cable terminal connections for a single repeater mounted in a J70171B apparatus case. The order-wire connections (E1 and E2) on an optional basis may terminate on the outside of the case. This allows a 1011B handset to be connected to the order wire without removing the container from the case. Care should be taken to avoid shorting the order-wire leads by taping one of the test clips of the handset.

#### J70171A Repeater Cabinet Assembly

**3.08** The J70171A repeater cabinet assembly (Fig. 4) is intended for pole mounting. A 19-inch framework inside the cabinet can mount seven J70171AB repeater shelves. Each shelf accommodates ten plug-in circuit packs (one full duplex repeater).

**3.09** The cabinet assembly contains a terminal block complete with lightning protection and a stub cable. The stub cable is 25 feet long and has 54 pairs of 22-gauge conductors. The stub cable connects to a gas-tight 1B6A-54 terminal block. This block contains carbon protector units

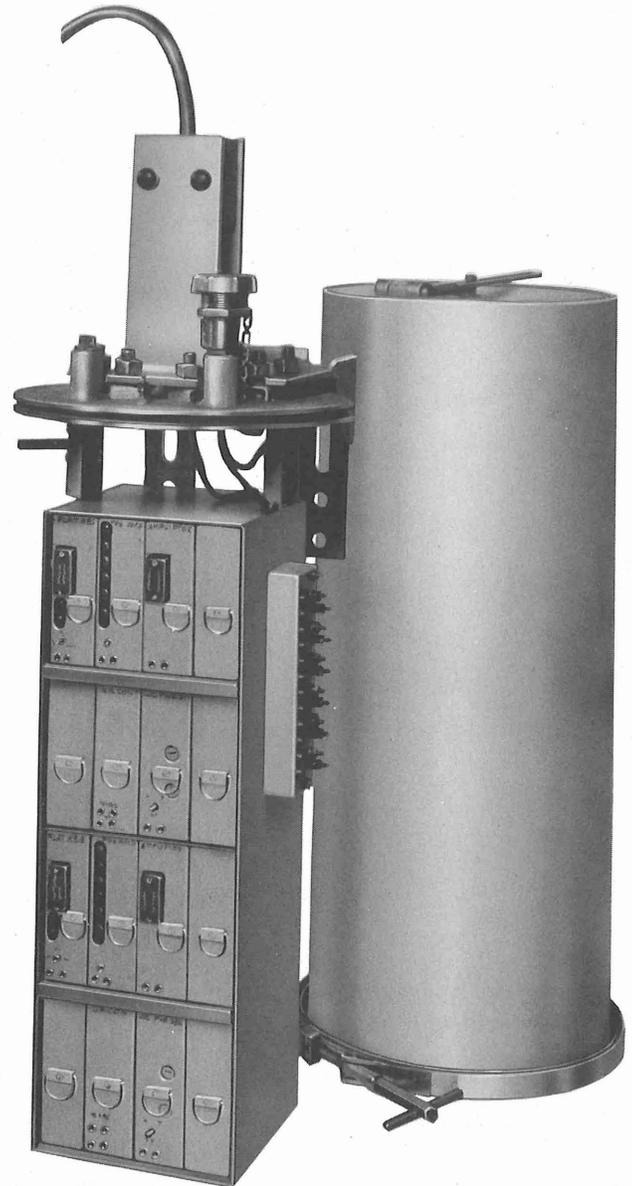


Fig. 2—J70171B Apparatus Case

for each stub cable conductor. The seven repeater shelves are wired to a 329A terminal strip. After the stub cable has been spliced in, cross connections are made between terminal block and terminal strip, as required.

**3.10** The cabinet is made of sheet steel, white enameled outside. Ventilation is provided through a screened opening in the bottom and a vent hood at the top. The overall dimensions of this cabinet, less mounting attachments and snow

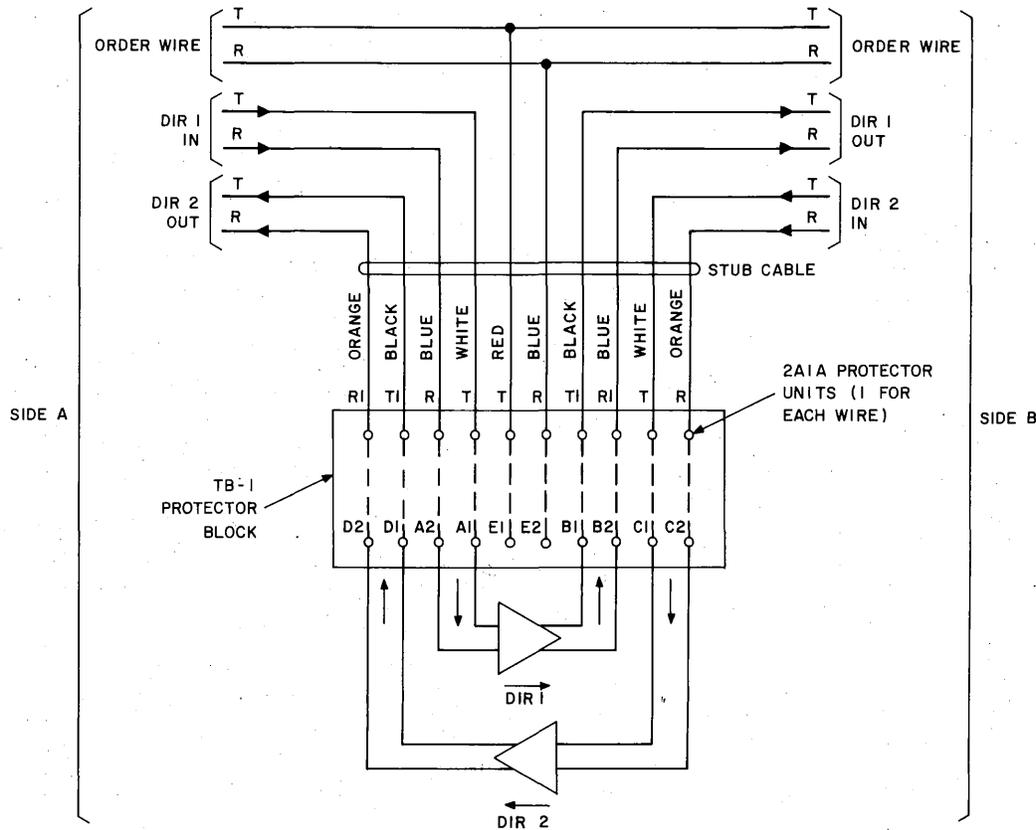


Fig. 3—Stub Cable Terminal Connections for J70171B Apparatus Case

shield, are approximately 23 inches wide, 16 1/8 inches deep, and 71 5/8 inches high including the vent hood.

3.11 Figure 5 shows the method of connecting seven repeaters, mounted in the J70171A cabinet. Order-wire connections for each circuit must be assigned at the terminal block.

4. POST INSTALLATION TEST REQUIREMENTS

4.01 Perform the polarity check, preliminary inspection and adjustments, energizing, equalization, and pilot alarm tests per Section 314-643-500.

5. REFERENCES

5.01 The following documents provide additional installation information.

NUMBER	TITLE
CD & SD-73051-01	WLR-5 Wideband Loop Repeater
SECTION	TITLE
640-020-206	Placing 460- and 470-type Apparatus Cases, Aerial and Underground
640-300-100	1B-Type Cable Terminal Blocks
640-300-200	Type N, O, and ON Carrier Systems, Description and Placing of Outdoor Repeater Cabinets
640-635-106	WLR-Type Repeaters, 470A Apparatus Cases, Description and Splicing

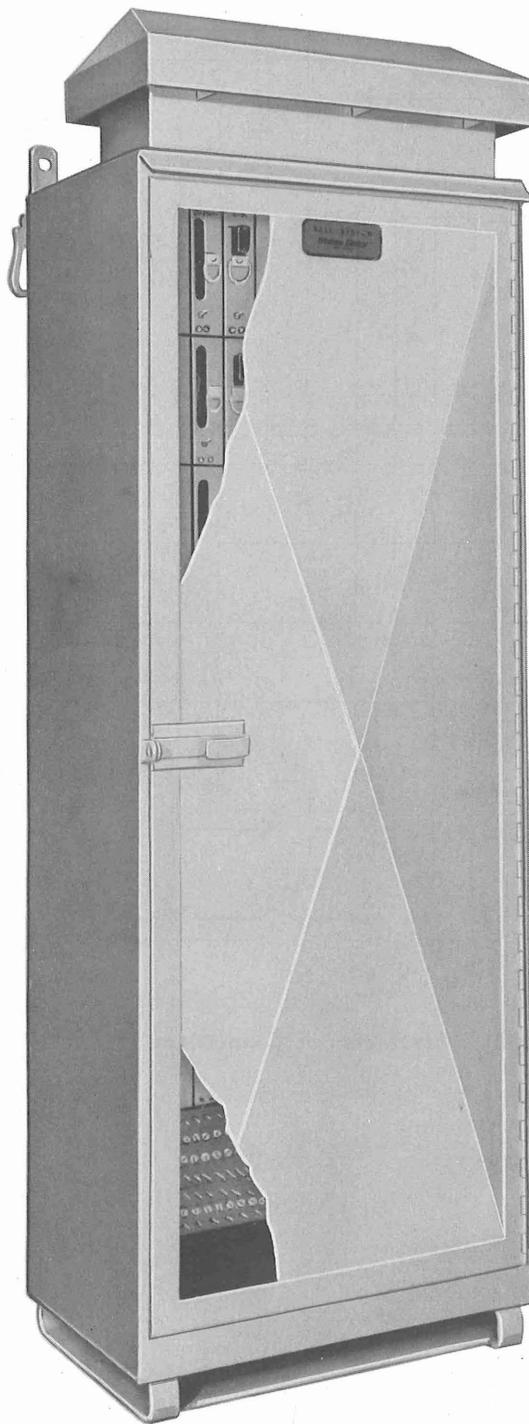


Fig. 4—J70171A Pole-Mounted Cabinet

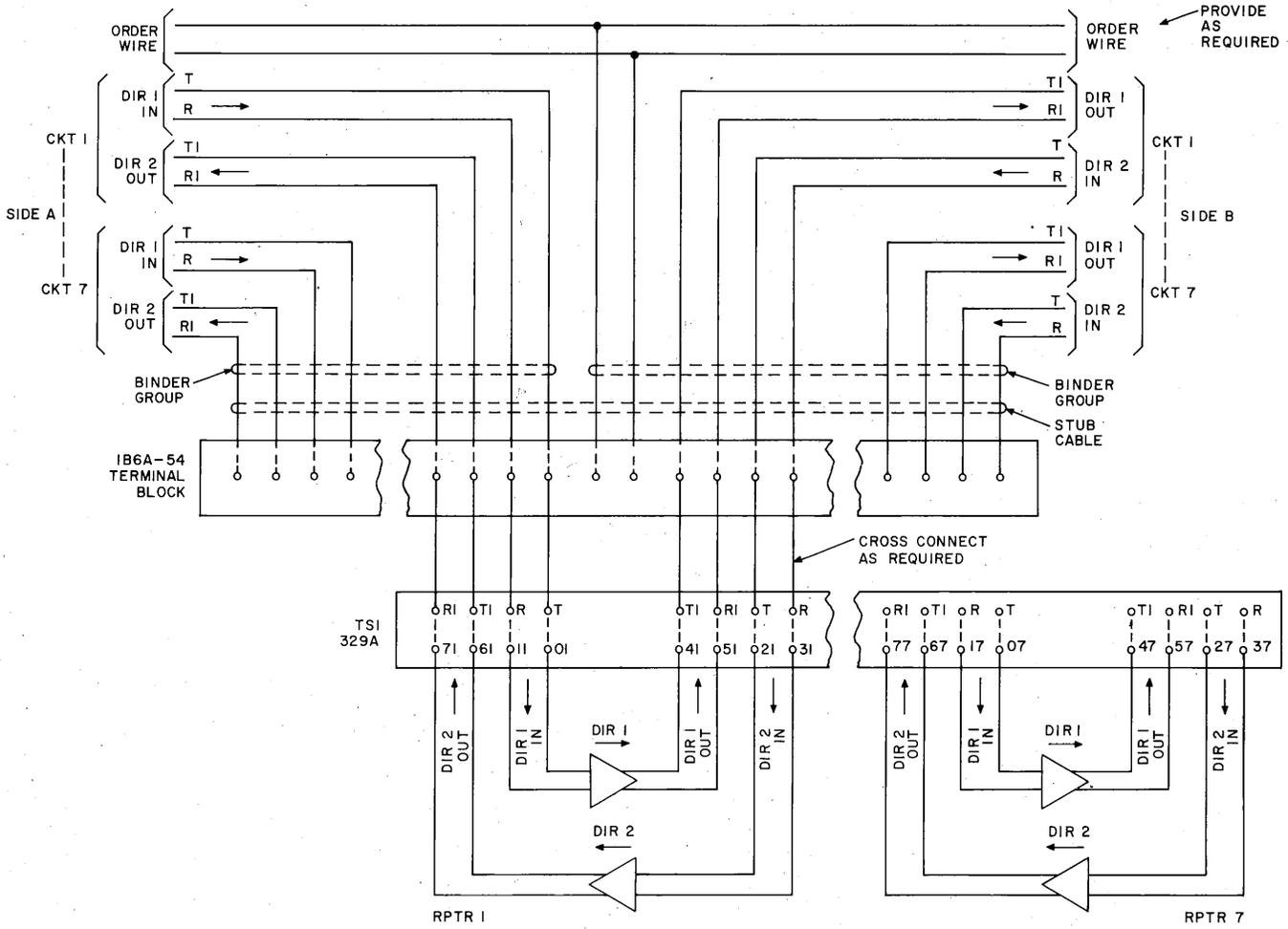


Fig. 5—Stub Cable Terminal Connections for J70171A Cabinet