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COMMON SYSTEMS V4 TELEPHONE REPEATER BATTERY SUPPLY AND CONNECTING CIRCUITS FOR TWO OR MORE VF AMPLIFIERS

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SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit provides arrangements for connecting 227-type amplifier sockets with various battery potentials and filters, terminating set sockets, equalizer sockets, and network sockets comprising the V4 telephone repeater.

SECTION II - DETAILED DESCRIPTION

1. 227-TYPE AMPLIFIER - FIG. 1

1.01 Fig. 1 shows the amplifier socket for the plug-in 227-type amplifier and necessary wiring to associate it with the proper battery supply figures and input and output jacks for testing and adjusting the transmission circuit.

2. V4 TELEPHONE REPEATERS

2.01 Fig. 10 gives the circuit for the 24V4A repeater. It consists of wiring to the sockets of the amplifiers (or networks), terminating set (or 4182 type network), and equalizer. Loop signaling and jack and power supply connections are included.

2.02 Amplifier, network and equalizer socket wiring, loop signaling, and jack and power supply connections for the 44V4A repeater are shown in Fig. 11.

2.03 Fig. 12 shows a loop-around signaling arrangement used with the terminating set when the external signaling circuit is not required.

2.04 Fig. 13 shows a strapping arrangement used with Fig. 11 when required by external signaling equipment, or as specified.

2.05 Amplifier, network and equalizer socket wiring, loop signaling, and jack and power supply connections for the 44V4B repeater for special service or data trunks are shown in Fig. 19.

2.06 Fig. 20 shows a strapping arrangement used with Fig. 19 when required by external signaling equipment, or as specified.

2.07 Fig. 25 is the circuit for the 24V4C repeater consisting of wiring to the sockets of the terminating set (or 4182 type network), amplifiers, networks, filter, and plug. Jack, terminal strip, loop signaling, and power supply connections are also shown.

2.08 Fig. 29 is the circuit for the 24V4D repeater consisting of wiring to the sockets of the terminating set, amplifiers, networks, filters, relays, and plug. Jack terminal strip, loop signaling, and power supply connections are also shown. This repeater is a 2-wire to 4-wire repeater with a signal loop-around feature when there is a power failure.

2.09 Fig. 32 is the circuit for the 424V4B repeater consisting of wiring to the sockets of the terminating set, amplifiers, relay, and networks. Jack, terminal strip, and power supply connections are also shown. This circuit is a 4-wire repeater which

permits bridging the TSPS No. 1 system on 4-wire® facilities, trunk circuits, or as required. Converting 4-wire trunk loop supervision to E and M lead supervision can be accomplished with this circuit by replacing the 849-type networks with 333A relays.

3. POWER SUPPLY AND FUSE ALARM CIRCUITS

3.01 Fig. 22 shows the circuit fuse and distribution circuit for a 24- or 48-volt power supply that will accommodate from 1 to 12 amplifiers.

3.02 Fig. 17 covers an arrangement using the 48-volt power supply. In this case, series resistor R5 is used with each amplifier to reduce the power supply voltage to a nominal 24-volt value. R5 also acts as a filter in conjunction with a capacitor inside the 227-type amplifier to reduce battery noise. The 1-1/3 ampere miscellaneous fuse or Fig. 22 supplies a maximum of 12 amplifiers.

3.03 One fuse alarm circuit, Fig. 31, is common to all fuses in one bay supplied by one battery feeder. An operated fuse in Fig. 22, 23, or 24 connects battery to lead A through -24 volt light (ALM), Fig. 6, or through -48 volt light (ALM), Fig. 7, operating relay (ALM/MJ ALM/MN ALM), and lighting lamp (2U ALM/MN ALM) or (2Y ALM/MN ALM), respectively.

3.04 A 48-volt power distribution circuit and fuse alarm for a maximum of 420 amplifiers is shown in Fig. 24.

3.05 Fig. 27 is the 48-volt power distribution circuit for TSPS No. 1 and No. 1 ESS offices for a maximum of 80 amplifiers.

3.06 Fig. 30 is the fuse alarm circuit for electronic offices. An operated fuse in Fig. 27 connects battery to lead A through diode CR1 or CR2 and through -48 volt light (MJ ALM) to ground, lighting lamp (2Y MJ ALM). When the office alarm system requires a relay contact closure for operation, contact M2 or M4 is used. These leads are then connected to the aisle pilot or audible and visible alarm circuit, or as required.

4. 24-VOLT FILTER CIRCUITS

4.01 The filter circuit in Fig. 9 is used with the 24-volt supply for 1 to 12 amplifiers.

4.02 Fig. 23 is the -24 volt decentralized filter for a maximum of 264 amplifiers. The maximum capacity of the filter is about 4-1/2 amperes and accommodates a nominal half bay of amplifiers.

5. 849-TYPE NETWORK - FIG. 21

5.01 Fig. 21 shows the wiring of an amplifier socket arranged for using 849-type networks between 4-wire loaded or nonloaded facilities and 600-ohm equipment. Fig. 150 illustrates the use of this circuit for connecting carrier systems to loaded or nonloaded cable pairs.

6. INFORMATION FIGURES

6.01 Fig. 101 is an information figure showing two amplifiers used as a basic V4 telephone repeater with associated battery supply and jacks.

6.02 Fig. 102 through 107 and Fig. 115 show in block schematic form the interconnections for various conditions of the 24V4A and 24V4C repeaters (Fig. 10 and 25) and associated circuits as indicated by the figure titles.

6.03 Fig. 108 through 114 and Fig. 117 through 127 show in block schematic form the interconnections for various conditions of the 44V4A repeater of Fig. 11 and associated circuits as indicated by figure titles.

6.04 Fig. 128 through 149 show in block schematic form the interconnections for various conditions of the 44V4B repeater of Fig. 19 and associated circuits as indicated by figure titles.

6.05 Fig. 150 shows in block schematic form the use of the 849-type network of Fig. 21 for connecting carrier systems to loaded and nonloaded cable pairs.

6.06 Fig. 151 is the information figure that shows the 24V4D repeater signal loop-around circuit in a block schematic form.

7. CONNECTING CIRCUIT INFORMATION - TABLE A

7.01 Table A incorporates connecting circuit information required for employing the 227-type amplifier.

8. ALARM CIRCUIT INFORMATION

8.01 Fig. 30 shows the fuse alarm circuit for electronic offices.

8.02 Fig. 31 shows the fuse alarm circuit for other offices.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

None.

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

3.01 The amplifier socket in this circuit, together with a plug-in 227-type amplifier, provides means for inserting gain in either 2-wire or 4-wire circuits. Two sockets with their associated plug-in amplifiers are employed as a basic V4 repeater.

3.02 It provides a power distribution circuit for 24-volt and 48-volt regulated batteries.

3.03 With the use of 24-volt regulated batteries, it provides for:

(a) A decentralized filter for a maximum of 264 amplifiers.

(b) A filter for one to 12 amplifiers.

3.04 It provides a fuse alarm circuit.

3.05 It provides equipment, amplifiers, and monitoring jacks.

3.06 It provides input, output, and monitoring jacks arranged for repeater testing and for monitoring.

3.07 It provides information for connecting one amplifier socket to an external circuit, and two amplifier sockets arranged to form a basic V4 repeater with input, output, and monitoring jacks.

3.08 It provides information for connecting an amplifier socket equipped with an 849-type network to external circuits.

3.09 It provides information for connecting various terminal and intermediate repeaters to external circuits.

3.10 It provides information for connecting a terminal repeater equipped with terminal blocks and sockets for balancing networks and filters. Access to standard level points permits connection to SF units, echo suppressors, etc.

3.11 It provides information for connecting to a 4-wire circuit on a bridging basis.

4. CONNECTING CIRCUITS

(a) Toll Testboard - Cable Gas Pressure Alarm Circuit - SD-55211-01.

(b) Tandem Patching Bay - Jack and Cord - SD-55248-01.

(c) Radio Telephone - E-1 Control Terminal - Signaling Order Wire Circuit - SD-55320-01.

(d) Toll Conference Service - Application Schematic - SD-55334-01.

(e) Signaling Application Schematic - Order Wire Circuit - SD-55385-01.

(f) Signaling Cutoff Relay Circuit - SD-55393-01.

(g) Line and Balancing - 4-Wire Repeating Coil - SD-55497-01.

(h) Signal Line and Balancing Multistation Line Circuit - SD-55647-01.

(i) Signaling Order Wire Circuit - SD-55954-01.

(j) Signaling Order Wire Circuit - TD or TH Radio - SD-56227-01.

(k) Signaling Order Wire Circuit - TD or TH Radio - SD-56228-01.

(l) Signaling 2-Wire Bridging Circuits - C1 Alarm and Control System - SD-56229-01.

(m) TD Radio - SD-56331-01.

(n) Signaling - Bridging Circuits - TD Radio Relay System - SD-56334-01.

(o) Signaling - 2-Hybrid Bridging Circuit - 1A Echo Suppressor - Application Schematic - SD-59035-01.

(p) Line and Balancing Telephone - Order-Wire Bridging Arrangements - 4-Wire Telephone Repeaters - SD-59046-01.

(q) Broadband Carrier Telephone - Patching Bay - SD-59329-01.

(r) 4-Wire Echo Suppressor - SD-62430-04.

(s) H1 Carrier Telephone - Application Schematic - SD-64083-01.

(t) Broadband Carrier Telephone - Voice-Frequency Patching and Monitoring Jacks - SD-64303-01.

(u) Line and Balancing - 4-Wire Terminating Set - SD-64304-01.

(v) C5 Carrier Telephone - Application Schematic - SD-64360-01.

(w) Signaling Telephone - Order-Wire Circuit - SD-64413-01.

(x) Program Transmission - Broadband Carrier Telephone - SD-64610-01.

(y) V1 and V2 Telephone Repeater - Application Schematic - SD-64903-01.

(z) V1 Telephone Repeater - Application Schematic - SD-64903-03.

(aa) Telephone Repeater - Regulator Network and Transfer Circuit - SD-64937-01.

(ab) Telephone Repeater Regulator Network and Transfer Circuit - SD-64937-02.

(ac) Toll Switching System No. 4 - SD-68001-01.

(ad) Toll Switching System No. 4 - SD-68002-01.

(ae) No. 4 Pad and Repeater Switch - SD-68004-01.

(af) Line and Balancing - 4-Wire Terminating Circuit - SD-95137-01.

(ag) V3 Line and Balancing - Application Schematic - SD-95144-01.

(ah) Maintenance Order-Wire Circuit - SD-6G010-01.

(ai) Broadband Restoration Order-Wire Circuit - SD-5G093-01.

(aj) Broadband Restoration Data Order-Wire Circuit - SD-5G094-01.

(ak) L4 Carrier, 4-Wire Order Circuit - SD-5G141-01.

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DEPT 4131-DTM-EGS

(al) DLL Circuit - SD-96234-01.

(am) DLL Circuit - SD-96555-01.

5. MANUFACTURING TESTING REQUIREMENTS

None.

SECTION IV - REASONS FOR REISSUE

D. Description of Changes

D.1 Fig. 29 and information Fig. 151 are added to cover the addition of the 24V4D repeater.

D.2 The 4182-type networks for 4-wire to 4-wire operation are added to the 24V4A and 24V4C repeaters

D.3 Fig. 26 is rated Mfr Disc. and Fig. 32 is added to allow connecting 4-wire trunk reverse battery supervision to E and M lead supervision.

D.4 Fig. 4 is rated Mfr Disc. and Fig. 31 is added for a fuse alarm circuit.

D.5 Fig. 28 is rated Mfr Disc. and Fig. 30 is added for a fuse alarm circuit for electronic offices.