PBX SYSTEMS
RANGE CHART
TRUNK AND STATION CONDUCTOR LOOP RANGES FOR PBXs CONNECTED TO PANEL CENTRAL OFFICES HAVING 635-OHM SUBSCRIBER CONDUCTOR LOOP 50-OHM TALKING BATTERY FEED CIRCUIT AC-DC OR SUPERIMPOSED RINGING (72, 80, OR 84 VOLTS MINIMUM AC COMPONENT) MINIMUM OFFICE VOLTAGE OF 21V (FLOATING)

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1. PURPOSE

1.01 The following pages show the permissible trunk and station conductor loop ranges of all commonly used PBXs connected to panel central offices having an individual subscriber conductor loop range of 635 ohms, operating at a minimum office voltage of 21V (floating) and AC-DC or superimposed ringing voltage of 72, 80, or 84 volts (AC component) and having a 50-ohm talking battery feed circuit. The trunk conductor loop ranges shown are the permissible resistance in ohms of the conductors between the central office main frame and the PBX main frame or terminal. The station conductor loop ranges shown are the permissible resistance in ohms of the conductors between the PBX main frame or terminal and the station telephone connecting block.

1.02 Where the ranges herein must be exceeded, long line equipment will be required. PBX ranges with long line circuits are covered in SD-96328-01, "Range Chart for PBXs for use in connection with Long Line Circuits."

1.03 Where PBX stations are provided with No. 1A or 1A1 key telephone systems the station ranges will usually be less than a regular PBX extension telephone. Ranges for these key telephone systems are shown in SD-69228-01 — "Station Systems Range Chart for No. 1A and 1A1 Key Telephone Systems Working Into Dial Central Offices, PBXs and Long Line Circuits in Dial Areas."

1.04 The ranges herein are based on 10 pulses-per-second dials. Where dials are 20 pulses per second, the maximum trunk conductor loop resistance is 450 ohms.

1.05 This range chart supersedes the use of data found on SD drawings and CD sheets under the caption "Working Limits" and range information in PBX Key Sheets, for establishing PBX ranges in this 635-ohm panel central office.

2. EXPLANATION OF CHARTS

2.01 Range data for each PBX situation is shown in a simple twin column of figures. The left column headed "Trk" contains the trunk conductor loop ranges with the corresponding permissible station conductor loop ranges in the right column headed "Sta." For example, the ranges for a 505 or 506 cordless-type PBX powered from a 10-cell local battery are shown as follows.

TRK	STA
0	350
275	350
V	V
510	115
510	0

(a) The two top pairs of figures show that 350 ohms is the maximum permissible station range and is satisfactory with any trunk loop between 0 and 275 ohms. When the trunk exceeds 275 ohms, the ranges here are limited by the central office in a through dial or night connection. Briefly stated, the sum of the PBX trunk range and the PBX station range cannot exceed the central office subscriber conductor loop ranges less the resistance of the series relay or relays in the PBX. The check mark (V) refers the chart user to a note to this effect. The last two pairs of figures show that 510 ohms is the maximum permissible trunk range and is satisfactory with any station loop between 0 and 115 ohms.

(b) In the case of 550 or 551 PBXs with B42 cord supervisory relays, performance of the PBX supervisory relay is the limiting range factor. The asterisk (*) refers the chart user to an intermediate table for details of ranges as determined by PBX supervision on a trunk call. The use of the notes under the check mark (V) and asterisk (*) eliminates any need for interpolation to determine values intermediate to those set down on the basic table.

2.02 There are many of the twin columns under each PBX. These are necessary to provide comprehensive data for all combinations of PBX power supply and arrangements and options in the PBX circuits. Footnotes are employed to cover deviations from the basic range data where required by variations in traffic and circuit conditions.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **505C, 506A, AND 506B PBXs**

LOCAL BATTERY							
8 Cells		9 Cells		10 Cells		11 Cells	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	150	0	250	0	350	0	450
475	150	375	250	275	350	175	450
√	√	√	√	√	√	√	√
510	115	510	115	510	115	510	115
510	0	510	0	510	0	510	0

LOCAL RECTIFIER	
101G	
Trk	Sta
0	250
375	250
√	√
510	115
510	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF:					
12 Volts		15 Volts		18 Volts	
Trk	Sta	Trk	Sta	Trk	Sta
0	50	0	200	0	350
510	50	425	200	275	350
510	0	√	√	√	√
		510	115	510	115
		510	0	510	0

√Deduct the known trunk conductor loop resistance from 625 ohms to obtain the permissible trunk conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 625 ohms to obtain the permissible trunk conductor loop resistance.

Where adjustment "B" is used on the B-456 or B-207 relays in the central office battery feed circuit, the maximum trunk conductor loop resistance is 200 ohms.

507A AND 507B PBXs

STATION LINES EQUIPPED WITH K2 LAMPS — NO LINE RELAY

LOCAL BATTERY					
9 Cells		10 Cells		11 Cells	
Trk	Sta	Trk	Sta	Trk	Sta
0	90	0	185	0	280
525	90	430	185	335	280
√	√	√	√	√	√
615	0	615	0	615	0

LOCAL RECTIFIER	
101G	
Trk	Sta
0	90
525	90
√	√
615	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF:													
16 Volts		18 Volts		20 Volts		22 Volts		24 Volts		26 Volts		28 Volts and Up	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	90	0	185	0	280	0	375	0	470	0	565	0	615
525	90	430	185	335	280	240	375	145	470	50	565	√	√
√	√	√	√	√	√	√	√	√	√	√	√	615	0
615	0	615	0	615	0	615	0	615	0	615	0		

STATION LINES EQUIPPED WITH LINE RELAY

LOCAL BATTERY	
9 Cells and Up	
Trk	Sta
0	615
√	√
615	0

LOCAL RECTIFIER	
101G	
Trk	Sta
0	615
√	√
615	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF:	
16 Volts and Up	
Trk	Sta
0	615
√	√
615	0

√Deduct the known trunk conductor loop resistance from 615 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 615 ohms to obtain the permissible trunk conductor loop resistance.

Where a trunk holding bridge consists of a No. 313A varistor in series with a 50-ohm inductor and adjustment "B" is used on the B-456 or B-207 relays in the central office battery feed circuit, the maximum allowable trunk conductor loop resistance is 400 ohms.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **550C, 550SC, 551A, 551B, AND 551D PBXs WITH B42 (IRON) CORD SUPERVISORY RELAYS**

6. **STATION LINES EQUIPPED WITH SINGLE B2 LAMPS — NO LINE RELAY**

LOCAL BATTERY								LOCAL RECTIFIER				DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
8 Cells		9 Cells		10 Cells		11 Cells		101G		101J			
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	105	0	155	0	210	0	265	0	105	0	155	0	105
345	105	285	155	240	210	200	265	345	105	285	155	345	105
*	*	*	*	*	*	*	*	*	*	*	*	*	*
495	0	495	0	495	0	495	0	495	0	495	0	495	0

15. **STATION LINES EQUIPPED WITH TWO B2 LAMPS IN MULTIPLE — NO LINE RELAY**

LOCAL BATTERY								LOCAL RECTIFIER				DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
8 Cells		9 Cells		10 Cells		11 Cells		101G		101J			
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	25	0	65	0	100	0	140	0	25	0	65	0	25
450	25	390	65	350	100	300	140	450	25	390	65	450	25
*	*	*	*	*	*	*	*	*	*	*	*	*	*
495	0	495	0	495	0	495	0	495	0	495	0	495	0

24. **STATION LINES EQUIPPED WITH LINE RELAY**

LOCAL BATTERY								LOCAL RECTIFIER				DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
8 Cells		9 Cells		10 Cells		11 Cells		101G		101J			
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	105	0	155	0	210	0	265	0	105	0	155	0	105
345	105	285	155	240	210	200	265	345	105	285	155	345	105
*	*	*	*	*	*	*	*	*	*	*	*	*	*
495	0	495	0	495	0	495	0	495	0	495	0	495	0

33. **STATION LINES EQUIPPED WITH G2 LAMPS — NO LINE RELAY — 8-CELL LOCAL BATTERY ONLY**

NUMBER OF G2 LAMPS							
One		Two		Three		Four	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	105	0	80	0	30	0	5
345	105	370	80	445	30	485	5
*	*	*	*	*	*	495	0
495	0	495	0	495	0		

41. *Find the trunk value nearest the known trunk conductor loop resistance in the Intermediate Table and read the coresponding station value. Or, if the station conductor loop resistance is known, find the nearest station value and read the corresponding trunk value.

45. ***INTERMEDIATE TABLE**

Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
200	265	255	190	300	140	350	100	400	60	460	20
210	250	270	170	310	130	360	90	415	50	475	10
225	230	280	160	325	120	370	80	430	40	485	5
240	210	290	150	340	110	385	70	445	30	495	0

51. The No. 54B coils in early No. 550C dial circuits with E-type relays, and No. 17F coils in early No. 550SC dial circuits with 206- and 207-type relays, shall be replaced by No. 54AA or 274AA coils per SD-66501-01.

54. The above ranges are based on a 120-ohm coil in the attendant dial circuit per Fig. A, SD-66572-01 or Fig. C, SD-66573-01. Where boards are equipped with 440-ohm coils the maximum permissible trunk conductor loop resistance is 350 ohms.

57. Where the AC component of the central office ringing voltage is 72-80 volts, the maximum allowable trunk conductor loop resistance for a trunk ring-up bridge consisting of an E4 relay with a 1 uf capacitor and thermistor is 400 ohms; 450 ohms for a bridge consisting of a No. 257A relay with a 1 uf capacitor and thermistor.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **551A, 551B, AND 551D PBXs WITH B1088 (PERMALLOY) CORD SUPERVISORY RELAYS**

6. **STATION LINES EQUIPPED WITH SINGLE B2 LAMPS — NO LINE RELAY**

LOCAL BATTERY							
8 Cells		9 Cells		10 Cells		11 Cells	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	165	0	245	0	320	0	395
455	165	375	245	300	320	225	395
√	√	√	√	√	√	√	√
620	0	620	0	620	0	620	0

LOCAL RECTIFIER			
101G		101J	
Trk	Sta	Trk	Sta
0	165	0	245
455	165	375	245
√	√	√	√
620	0	620	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
Trk	Sta
0	165
455	165
√	√
620	0

STATION LINES EQUIPPED WITH TWO B2 LAMPS IN MULTIPLE — NO LINE RELAY

LOCAL BATTERY							
8 Cells		9 Cells		10 Cells		11 Cells	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	25	0	65	0	100	0	140
595	25	555	65	520	100	480	140
√	√	√	√	√	√	√	√
620	0	620	0	620	0	620	0

LOCAL RECTIFIER			
101G		101J	
Trk	Sta	Trk	Sta
0	25	0	65
595	25	555	65
√	√	√	√
620	0	620	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
Trk	Sta
0	25
595	25
√	√
620	0

STATION LINES EQUIPPED WITH LINE RELAY

LOCAL BATTERY							
8 Cells		9 Cells		10 Cells		11 Cells	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	260	0	335	0	410	0	485
360	260	285	335	210	410	135	485
√	√	√	√	√	√	√	√
620	0	620	0	620	0	620	0

LOCAL RECTIFIER			
101G		101J	
Trk	Sta	Trk	Sta
0	260	0	335
360	260	285	335
√	√	√	√
620	0	620	0

DIRECT FEEDERS FROM CENTRAL OFFICE OR BUILDING BATTERY ENGINEERED FOR A MINIMUM PBX VOLTAGE OF 14V	
Trk	Sta
0	260
360	260
√	√
620	0

33. **STATION LINES EQUIPPED WITH G2 LAMPS — NO LINE RELAY — 8-CELL LOCAL BATTERY ONLY**

NUMBER OF G2 LAMPS							
One		Two		Three		Four	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	260	0	80	0	30	0	5
360	260	540	80	590	30	615	5
√	√	√	√	√	√	620	0
620	0	620	0	620	0		

41. √Deduct the known trunk conductor loop resistance from 620 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 620 ohms to obtain the permissible trunk conductor loop resistance.

45. The above ranges are based on a 120-ohm coil in the attendant dial circuit per Fig. A, SD-66572-01. Where boards are equipped with 440-ohm coils, the maximum permissible trunk conductor loop resistance is 350 ohms.

48. Where the AC component of the central office ringing voltage is 72-80 volts, the maximum trunk conductor loop resistance for a trunk ring-up bridge consisting of an E4 relay with a 1 uf capacitor and thermistor is 400 ohms; 450 ohms for a bridge consisting of a No. 257A relay with a 1 uf capacitor and thermistor; 550 ohms for a bridge consisting of an E4 relay with a 1 uf capacitor.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **552A, 552B, 552D, 552E, AND 605A PBXs**

6. **17-CELL LOCAL BATTERY**

ONE 2T LAMP		ONE K2 LAMP		TWO K2 LAMPS		THREE K2 LAMPS		FOUR K2 LAMPS		R603 LINE RELAY		R1910 LINE RELAY		EA30 LINE RELAY	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	10	0	615	0	410	0	235	0	160	0	615	0	425	0	615
555	10	√	√	205	410	380	235	455	160	√	√	190	425	√	√
555	0	555	60	√	√	√	√	√	√	555	60	√	√	555	60
		555	0	555	60	555	60	555	60	555	0	555	60	555	0
				555	0	555	0	555	0			555	0		

15. **18-CELL LOCAL BATTERY**

ONE 2T LAMP		ONE K2 LAMP		TWO K2 LAMPS		THREE K2 LAMPS		FOUR K2 LAMPS		R603 LINE RELAY		R1910 LINE RELAY		EA30 LINE RELAY	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	80	0	615	0	455	0	265	0	185	0	615	0	530	0	615
535	80	√	√	160	455	350	265	430	185	√	√	85	530	√	√
√	√	555	60	√	√	√	√	√	√	555	60	√	√	555	60
555	60	555	0	555	60	555	60	555	60	555	0	555	60	555	0
555	0			555	0	555	0	555	0			555	0		

24. **48V POWER PLANT — AMPERE-HOUR METER REGULATION (44V MINIMUM)**

ONE 2Y LAMP		ONE C2 LAMP		TWO C2 LAMPS		THREE C2 LAMPS		FOUR C2 LAMPS		R603 LINE RELAY		R1910 LINE RELAY		EA30 LINE RELAY	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	175	0	615	0	465	0	270	0	190	0	615	0	615	0	615
440	175	√	√	150	465	345	270	425	190	√	√	√	√	√	√
√	√	555	60	√	√	√	√	√	√	555	60	555	60	555	60
555	60	555	0	555	60	555	60	555	60	555	0	555	0	555	0
555	0			555	0	555	0	555	0						

33. **48V POWER PLANT — VOLTAGE REGULATION (48V MINIMUM)**

ONE 2Y LAMP		ONE C2 LAMP		TWO C2 LAMPS		THREE C2 LAMPS		FOUR C2 LAMPS		R603 LINE RELAY		R1910 LINE RELAY		EA30 LINE RELAY	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	325	0	615	0	550	0	330	0	230	0	615	0	615	0	615
290	325	√	√	65	550	285	330	385	230	√	√	√	√	√	√
√	√	555	60	√	√	√	√	√	√	555	60	555	60	555	60
555	60	555	0	555	60	555	60	555	60	555	0	555	0	555	0
555	0			555	0	555	0	555	0						

42. √Deduct the known trunk conductor loop resistance from 615 ohms to obtain the permis-
43. sible station conductor loop resistance. Where the station conductor loop resistance
44. is known, deduct this value from 615 ohms to obtain the permissible trunk conductor
45. loop resistance.

46. The above ranges are based on dial circuit SD-66425-01, Fig. 2, or dial circuit
47. SD-66425-01, Fig. 1 modified per SD-66574-01, Fig. 2 and E. Where boards are equipped
48. with 440-ohm coils per Fig. 1, SD-66425-01, the maximum permissible trunk conductor
49. loop resistance is 350 ohms.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **555 PBX**

6. **STATION LINES EQUIPPED WITH K2 LAMPS — NO LINE RELAY**

7. **Direct Feeders from Central Office or Building Battery Engineered for a Minimum PBX Voltage of:**

16 VOLTS		18 VOLTS		20 VOLTS		22 VOLTS		24 VOLTS		26 VOLTS		28V AND UP	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	90	0	180	0	275	0	370	0	470	0	560	0	600
510	90	420	180	325	275	230	370	130	470	40	560	√	√
√	√	√	√	√	√	√	√	√	√	√	√	600	0
600	0	600	0	600	0	600	0	600	0	600	0		

Powered by Local PBX Power Plant

9 CELL BATTERY		10 CELL BATTERY		11 CELL BATTERY		101G RECTIFIER		KS-15668 RECTIFIER	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	90	0	180	0	275	0	90	0	600
510	90	420	180	325	275	510	90	√	√
√	√	√	√	√	√	√	√	600	0
600	0	600	0	600	0	600	0		

STATION LINES EQUIPPED WITH UA97 LINE RELAY

Direct Feeders from Central Office or Building Battery Engineered for a Minimum PBX Voltage of:

16 VOLTS		18V AND UP	
Trk	Sta	Trk	Sta
0	475	0	600
125	475	√	√
√	√	600	0
600	0		

Powered by Local PBX Power Plant

9 CELL BATTERY		10 CELL BATTERY		11 CELL BATTERY		101G RECTIFIER		KS-15668 RECTIFIER	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	475	0	600	0	600	0	475	0	600
125	475	√	√	√	√	125	475	√	√
√	√	600	0	600	0	√	√	600	0
600	0					600	0		

√Deduct the known trunk conductor loop resistance from 600 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 600 ohms to obtain the permissible trunk conductor loop resistance.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)
5. 48V PBX Power Plant with Voltage Regulation (48V Minimum)

6. **607A PBX**

Trk	Sta
0	615
√	√
350	265
350	0

12. √Deduct the known trunk conductor loop resistance from 615 ohms to obtain the permis-
13. sible station conductor loop resistances. Where the station conductor loop resist-
14. ance is known, deduct this value from 615 ohms to obtain the permissible trunk con-
15. ductor loop resistance.

16. **608A PBX**

Line Relay		One K2 Lamp		Two K2 Lamps		Three K2 Lamps		Four K2 Lamps		Five K2 Lamps		Six K2 Lamps	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	615	0	615	0	380	0	200	0	150	0	100	0	70
√	√	√	√	235	380	415	200	465	150	515	100	545	70
615	0	615	0	√	√	√	√	√	√	√	√	√	√
				615	0	615	0	615	0	615	0	615	0

24. √Deduct the known trunk conductor loop resistance from 615 ohms to obtain the permis-
25. sible station conductor loop resistance. Where the station conductor loop resist-
26. ance is known, deduct this value from 615 ohms to obtain the permissible trunk con-
27. ductor loop resistance.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **701A, 701B, OR 740AX PBXs (USED WITH NO. 552A, 552B, 605A, 607A, OR 608A MANUAL SWITCH-**
6. **BOARDS) AND 711A AND 711B PBXs**

7. **Dial Station Lines and 2-way Trunks — Manual and Dial Selected with Toll Diversion**

8.

701A or 711A PBXs							
Amp Hr Meter Reg (44V Min.)				Voltage Reg (48V Min.)			
Line Relay Adj "A"		Line Relay Adj "B"		Line Relay Adj "A"		Line Relay Adj "B"	
Trk	Sta	Trk	Sta	Trk	Sta	Trk	Sta
0	370	0	495	0	515	0	535
165	370	40	495	20	515	√	√
√	√	√	√	√	√	535	0
535	0	535	0	535	0		

701B, 711B, and 740AX PBXs	
Voltage Reg and Amp Hr Meter Reg	
Trk	Sta
0	535
√	√
535	0

17. √Deduct the known trunk conductor loop resistance from 535 ohms to obtain the per-
18. missible station conductor loop resistance. Where the station conductor loop
19. resistance is known, deduct this value from 535 ohms to obtain the permissible trunk
20. conductor loop resistance.

21. **Dial Station Lines and 2-way Trunks — Manual and Dial Selected (No Toll Diversion)**
22. Add 25 ohms to the above trunk values.

23. **Dial Station Lines and One-way Outgoing Dial Selected Trunks with Toll Diversion**
24. Add 20 ohms to the above trunk values.

25. **Dial Station Lines and One-way Outgoing Dial Selected Trunk — No Toll Diversion**
26. Add 45 ohms to the above trunk values.

27. **Dial Station Lines with 2-way Manual Central Office Trunks**
28. Add 80 ohms to the above trunk values.

29. **Manual Station Line with 2-way Manual Central Office Trunks**
30. Refer to the appropriate page in this chart for the manual switchboard used.

31. **Manual Station Lines with 2-way Manual and Dial Selected Trunks**
32. The ranges are the same as for manual station lines with 2-way manual central office
33. trunks less 80 ohms if the trunk is arranged for toll diversion or 55 ohms if not
34. so arranged.

35. **Attendant Dial Circuits and any Trunk Circuit**
36. The above ranges apply with No. 552A, 552D, or 605A switchboard equipped with dial cir-
37. cuit SD-66425-01, Fig. 2, or dial circuit SD-66425-01, Fig. 1 modified per SD-66574-01,
38. Fig. 2 and E. Where the No. 607A switchboard, or a No. 552A, 552D, or 605A switchboard having
39. dial circuit per Fig. 1, SD-66425-01, is used, the maximum permissible trunk conductor
40. loop resistance is 350 ohms with manual central office trunks; 270 ohms with manual
41. and dial selected trunks having toll diversion and 295 ohms without toll diversion.

42. The above ranges apply where trunks per SD-65657-01, SD-66607-01, or SD-66618-01 are
43. used with a capacitive shunt on the "S" relay and where the earth potential at the
44. PBX with respect to the central office does not exceed ±10 volts.

45. The "S" relay of SD-66442-01, SD-66274-01, SD-66443-01, SD-66051-01, and SD-66052-01
46. may be shunted by its 40-ohm noninductive winding if the capacitor is not required
47. to reduce the unbalance caused by the "S" relay.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)
5. 48V PBX Power Plant
6. Trunk Circuit SD-66274-01#
7. 0 to ±10 Volts Earth Potential at the PBX with Respect to the Central Office

8. **740A AND 740B PBXs**

9.

Trk	Sta
0	580
√	√
580	0

13. √Deduct the known trunk conductor loop resistance from 580 ohms to obtain the permis-
14. sible station conductor loop resistance. Where the station conductor loop resistance
15. is known, deduct this value from 580 ohms to obtain the permissible trunk conductor
16. loop resistance.

17. #For this trunk circuit the "S" relay may be shunted by its 40-ohm noninductive
18. secondary winding if the capacitor is not required to reduce the unbalance caused by
19. the "S" relay.

20. Where toll diversion is furnished deduct 25 ohms from the "Trk" values shown.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)
5. 48V PBX Power Plant with Voltage Regulation (48V Minimum)

6. **740E DIAL PBX WITH A NO. 552A, 552D, OR 605A MANUAL SWITCHBOARD #**

7. **#Dial Station Lines and 2-way Trunks — Manual and Dial Selected with Toll Diversion**

Trk	Sta
0	535
√	√
535	0

12. √Deduct the known trunk conductor loop resistance from 535 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 535 ohms to obtain the permissible trunk conductor loop resistance.

16. **#Dial Station Lines and 2-way Trunks — Manual and Dial Selected (No Toll Diversion)**
17. Add 25 ohms to the above trunk values.

18. **#Dial Station Lines and One-way Outgoing Dial Selected Trunks with Toll Diversion**
19. Add 20 ohms to the above trunk values.

20. **#Dial Station Lines and One-way Outgoing Dial Selected Trunk — No Toll Diversion**
21. Add 45 ohms to the above trunk values.

22. **#Dial Station Lines with 2-way Manual Central Office Trunks**
23. Add 80 ohms to the above trunk values.

24. **#Manual Station Lines with 2-way Manual Central Office Trunks**
25. Refer to the appropriate page in this chart for the manual switchboard used.

26. **#Manual Station Lines with 2-way Manual and Dial Selected Trunks**
27. The ranges are the same as for manual station lines with 2-way manual central office
28. trunks less 80 ohms if the trunk is arranged for toll diversion or 55 ohms if not so
29. arranged.

30. **#Attendant Dial Circuits and Any Trunk Circuit**
31. The above ranges apply where the manual switchboards are equipped with dial circuit
32. SD-66425-01, Fig. 2, or dial circuit SD-66425-01, Fig. 1, modified per SD-66574-01,
33. Fig. 2 and E. Where the manual switchboard is equipped with dial circuit per
34. Fig. 1, SD-66425-01, the maximum permissible trunk conductor loop resistance is 350
35. ohms with manual central office trunks; 270 ohms with manual and dial selected
36. trunks having toll diversion and 295 ohms without toll diversion.

37. **740E DIAL PBX WITH ATTENDANT KEY TEL SET OR NO. 101A KEY EQPT SD-65725-01†**

38. **†Dial Station Lines and 2-way Trunks — Manual and Dial Selected with Toll Diversion**

Trk	Sta
0	555
√√	√√
555	0

43. √√Deduct the known trunk conductor loop resistance from 555 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 555 ohms to obtain the permissible trunk conductor loop resistance.

47. **†Dial Station Lines and 2-way Trunks — Manual and Dial Selected (No Toll Diversion)**
48. Add 25 ohms to the above trunk values.

49. For the trunk circuit used the above values are applicable when a capacitive shunt
50. is used across the "S" relay.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)
5. 48V PBX Power Plant with Voltage Regulation (48V Minimum)

6. **740E DIAL PBX WITH A NO. 556A MANUAL SWITCHBOARD**

7. **Dial Station Lines and 2-way Trunks — Manual and Dial Selected with Toll Diversion**

Trk	Sta
0	520
√	√
520	0

12. √Deduct the known trunk conductor loop resistance from 520 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 520 ohms to obtain the permissible trunk conductor loop resistance.

16. **Dial Station Lines and 2-way Trunks — Manual and Dial Selected (No Toll Diversion)**
17. Add 25 ohms to the above trunk values.

18. **Dial Station Lines and One-way Outgoing Dial Selected Trunks with Toll Diversion**
19. Add 35 ohms to the above trunk values.

20. **Dial Station Lines and One-way Outgoing Dial Selected Trunk — No Toll Diversion**
21. Add 60 ohms to the above trunk values.

22. **Dial Station Lines with 2-way Manual Central Office Trunks**
23. Add 80 ohms to the above trunk values.

24. **Manual Station Line with 2-way Manual Central Office Trunks**

Trk	Sta
0	600
√√	√√
600	0

29. √√Deduct the known trunk conductor loop resistance from 600 ohms to obtain the permissible trunk conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 600 ohms to obtain the permissible trunk conductor loop resistance.

33. **Manual Station Lines with 2-way Manual and Dial Selected Trunks**
34. The ranges are the same as for manual station lines with 2-way manual central
35. office trunks less 80 ohms if the trunk is arranged for toll diversion, or 55 ohms
36. if not so arranged.

37. For the trunk circuit used the above values are applicable when a capacitive shunt
38. is used across the "S" relay.

PBX CONDUCTOR LOOP RANGES FOR 635-OHM PANEL OFFICES

1. 635-ohm Maximum Central Office Subscriber Conductor Loop
2. 21V Minimum Central Office Voltage (Floating)
3. 50-ohm Talking Battery Feed Circuit
4. 72, 80, or 84 Minimum Central Office Ringing Voltage (AC Component)

5. **750A PBX**

KEYLESS STATION	
Trk	Sta
0	285
300	285
√	√
585	0

B1 LAMP	
Trk	Sta
0	50
535	50
√	√
585	0

S52 RELAY AND AC OPERATED NO. 51A LAMP	
Trk	Sta
0	75
510	75
√	√
585	0

√Deduct the known trunk conductor loop resistance from 585 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 585 ohms to obtain the permissible trunk conductor loop resistance.

16. **755A PBX**

USING DC-OPERATED LAMP					
B2 Lamp		A1 Lamp		51A Lamp	
Trk	Sta	Trk	Sta	Trk	Sta
0	255	0	100	0	100
360	255	515	100	515	100
√√	√√	√√	√√	√√	√√
615	0	615	0	615	0

USING AC-OPERATED NO. 51A LAMP			
ST Relay UA 16		ST Relay U6046	
Trk	STA	Trk	Sta
0	310	0	275
305	310	340	275
√√	√√	√√	√√
615	0	615	0

KEYLESS STATION	
U322 Line Relay	
Trk	Sta
0	330
285	330
√√	√√
615	0

√√Deduct the known trunk conductor loop resistance from 615 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 615 ohms to obtain the permissible trunk conductor loop resistance.

28. **756A PBX**

29. **756A PBX WITH A NO. 700A KEY TELEPHONE SET**

Trk	Sta
0	575
√√√	√√√
575	0

√√√Deduct the known trunk conductor loop resistance from 575 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 575 ohms to obtain the permissible trunk conductor loop resistance.

38. **756A PBX WITH A NO. 556A MANUAL SWITCHBOARD #**

39. **#Dial Station Lines and One-way Outgoing Dial Selected Trunks**
40. The ranges are the same as with the No. 700A key telephone set lines 31 through 33 above.

41. **#Manual Station Line with 2-way Manual Central Office Trunks**

Trk	Sta
0	600
√√√√	√√√√
600	0

√√√√Deduct the known trunk conductor loop resistance from 600 ohms to obtain the permissible station conductor loop resistance. Where the station conductor loop resistance is known, deduct this value from 600 ohms to obtain the permissible trunk conductor loop resistance.