

PBX CONFERENCE BRIDGE CIRCUITS TWO-WIRE NONGAIN TYPE

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1. GENERAL

1.01 This section covers circuit characteristics, transmission features, and application of two-wire nongain PBX conference bridge circuits.

2. CIRCUIT CHARACTERISTICS

2.01 Nongain conference bridge circuits are provided for use at both manual and dial PBXs. They vary in capacity from four to ten outlets. The outlets are coupled into the common bridging portion of the circuit in either a series or parallel arrangement.

2.02 Fig. 1 shows a 5-outlet series bridge with three station and two trunk outlets. As discussed in Section AB22.329.0, Par. 3.03, no central office trunks should be connected to this type bridge. All outlets are jack-terminated on the PBX switchboard. Each station outlet utilizes a repeating coil, wired to give a 4:1 impedance ratio, for coupling the individual outlet into the common bridging circuit. The trunk outlets are both capacity-coupled into the bridge. The three station outlets and the first trunk outlet are connected in series with each other and the second trunk outlet is connected in parallel with the first.

2.03 Station battery is provided through the repeating coil windings in each station outlet. The outlets designated trunk may also be used for connecting stations into the bridge. When so used, the station battery is supplied through the switchboard cord circuit.

2.04 Fig. 2(A) and (B) shows the simplified transmission schematics of the parallel bridge used with step-by-step PBXs. Two outlet circuits are available, one for terminating on a selector bank (Fig. 2A), the other for terminating on a connector bank (Fig. 2B). Connection to the bridge is established by dialing the number assigned to the conference circuit. If the first terminals of the conference circuit are busy, the succeeding terminals will be seized in the order in which they appear on the switch bank. The bridge can be equipped for a maximum of ten outlets. The selector outlets provide station battery through a battery feed relay. Where the connector outlets are used, station battery is provided by the connector circuit.

2.05 A representative list of nongain bridge circuits is shown in Table I. The table contains the SD drawing number, the PBXs with which each circuit can be used, and other information applicable to each circuit.

3. TRANSMISSION FEATURES

3.01 The nongain conference circuit, because of its excessive insertion loss, does not provide transmission compatible with today's standards, and therefore its use is very restricted, as discussed in Part 4 of this section.

3.02 Insertion and return losses vary considerably depending on the impedance of the connected lines and trunks and the number of bridge outlets. Nominal losses for the basic series and parallel bridges are shown in Table II.

3.03 It is evident that the insertion losses introduced by the nongain bridge, when added to the average facility and equipment losses of PBX services, degrade transmission levels far below today's acceptable standards.

4. APPLICATION

4.01 In view of the transmission penalty incurred with the nongain bridge, it is no longer approved for use at PBXs where tie

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trunks or central office trunks may be included in a conference call. Where used exclusively for PBX station conferencing, the number of outlets should be limited to a maximum of six if any off-premise stations are to be included in the conference. It should be recognized, however, that once the bridge is in service, it would be impractical to control the customer's use of the bridge within the above-mentioned limitations.

4.02 Where applicable arrangements are available, the various PBX arrangements incorporating the transistorized bridge, discussed in Section AB22.329.4, will economically provide

adequate transmission. Therefore, it is recommended that the transistorized bridge should be used for new installations and also as a replacement to alleviate transmission complaints involving existing nongain bridges.

4.03 This leaves a very limited field where use of the nongain bridge can be justified on a cost or transmission basis. Where it is felt that these bridges can be justified, it is recommended that its use be evaluated, by the appropriate transmission group, to be sure that the resulting transmission will satisfactorily meet the customer's requirements.

TABLE I
Nongain Conference Bridges

BRIDGE IDENTIFICATION	CIRCUIT NO.	TYPE	OUTLETS
A	SD-66531-01	1	5 3 sta, 2 trks
B	SD-66462-01	1	4-5 3 sta, 1-2 trks
C	SD-66338-01	1	4-5 3 sta, 1-2 trks
D	SD-66434-01	1	4-5-6 3-4 sta, 1-2 trks
E	SD-65745-01	2	5 3 sta, 2 trks
F	SD-66461-01	3	2-10 2-10 sta or trks

Type Classification

- 1 Manual — series outlets
- 2 Dial — series outlets
- 3 Dial — parallel outlets

TYPE PBX	APPLICABLE BRIDGE	TYPE PBX	APPLICABLE BRIDGE
550B,C,SC	C	607A,B	D
551A,B	C	608A,B,C	B,D
552A,B,E	B	700C	F
555	A	701A,B	F
556A	B	702A	F
557A	A	710C	F
600C	C	711A,B	F
605A	B	740A,B,E	F
606A,B	D	756A	E

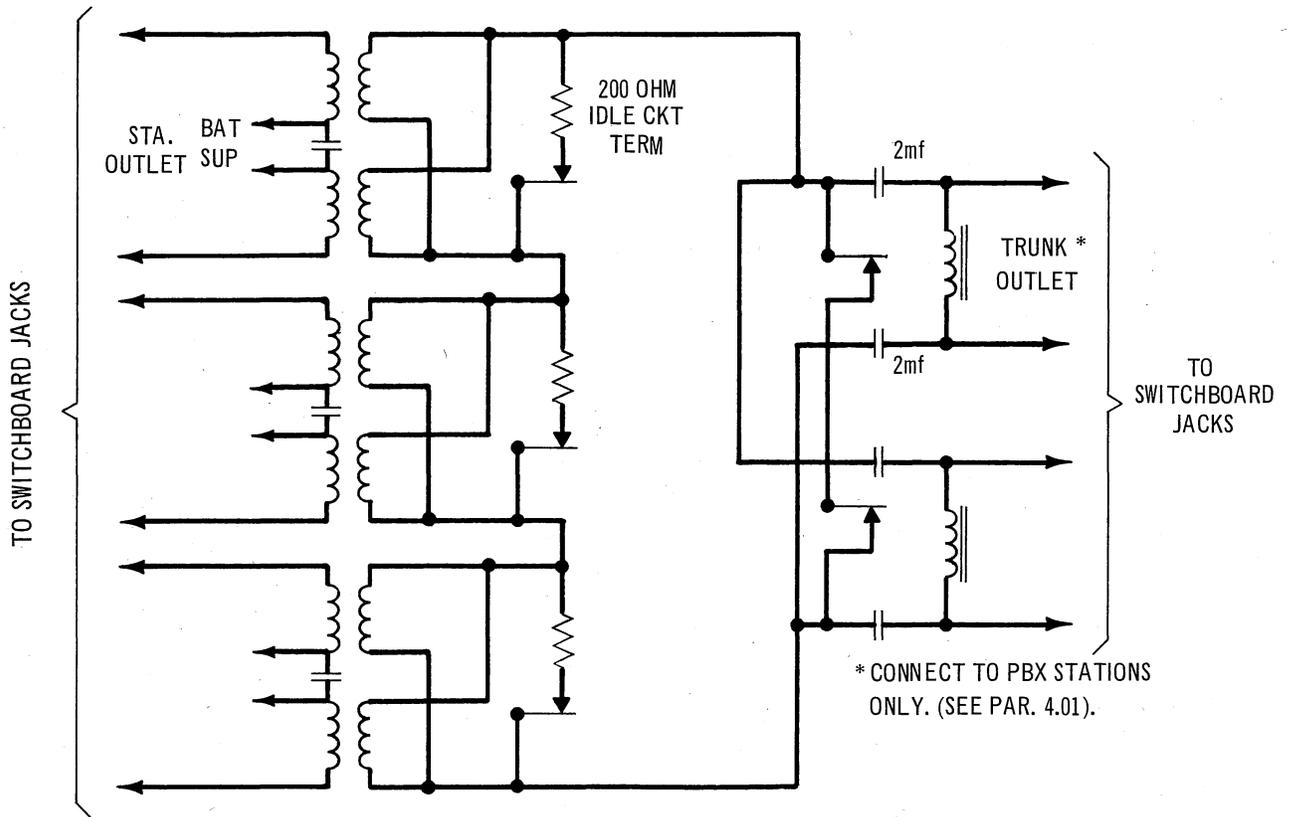


Fig. 1 - Transmission Schematic - Nongain - Series Manual Conference Circuit

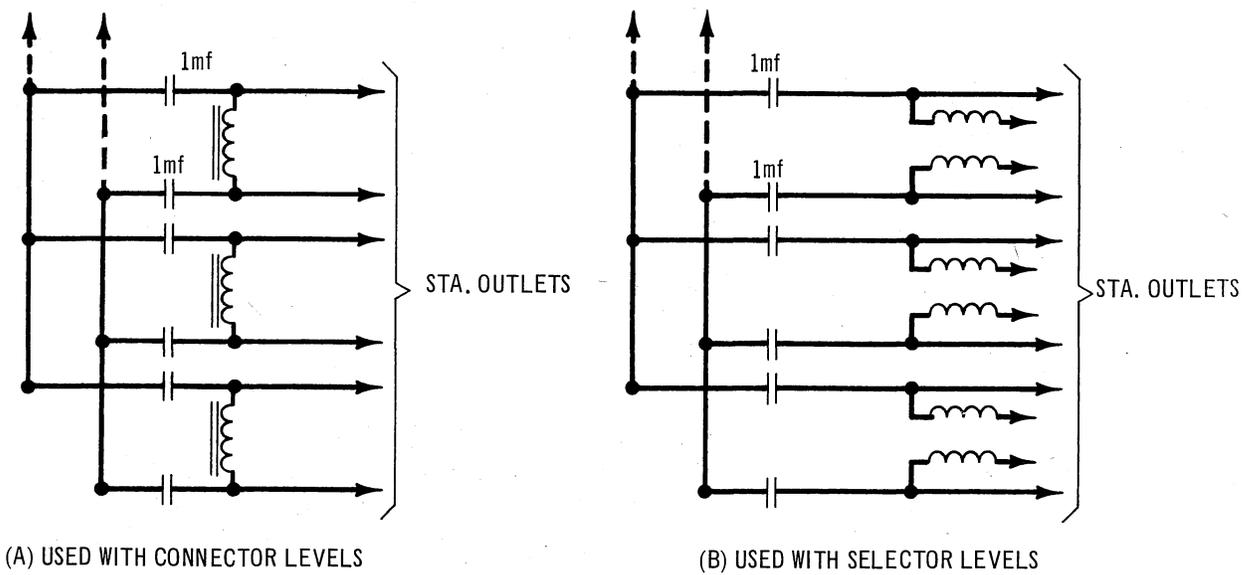


Fig. 2 - Transmission Schematic - Nongain - Parallel Dial Conference Circuit

TABLE II
NON-GAIN CONFERENCE CIRCUIT TRANSMISSION DATA

	Number of Outlets	Number of Stations	Number of Trunks	Station Idle Circuit Termination	Nominal Insertion Loss DB (See Note 1)			Return Loss-DB (See Note 2)
					Station to Station	Station to Trunk	Trunk to Trunk	
SD 66531-01 (Series-Manual)	5	2-3	0	200Ω	3.5			
SD 65745-01 (Series Dial)	5	1-3 1-3	1 2	200Ω 200Ω	10.9 8.0	5.0 8.0	4.4	16.9 8.0
SD 66338-01 (Series-Manual)	4	2	0	0	0	-	-	-
SD 66462-01 (Series Manual)	4	3	0	0	3.5	-	-	-
	4	1	1	0	-	2.0	-	4.4
	4	2	1	0	9.5	3.6	-	9.5
	4	3	1	0	10.9	5.0	-	16.9
	5	2-3	0	200Ω	3.5	-	-	-
	5	1-3	1	200Ω	10.9	5.0	-	16.9
	5	1-3	2	200Ω	8.0	8.0	4.4	8.0
SD 66434-01 (Series Manual)	6	2-4	0	200Ω	6.0	-	-	-
SD 66461-01 (Parallel Dial)	6	1-4	1	200Ω	12.0	6.0	-	∞
	6	1-4	2	200Ω	9.5	9.5	3.5	9.5
SD 66461-01 (Parallel Dial)	2	0-2	2-0	∞	0	0	0	∞
	3	0-3	3-0	∞	3.5	3.5	3.5	9.5
	4	0-4	4-0	∞	6.0	6.0	6.0	6.0
	5	0-5	5-0	∞	8.0	8.0	8.0	4.4
	6	0-6	6-0	∞	9.5	9.5	9.5	3.5
	7	0-7	7-0	∞	10.9	10.9	10.9	2.9
	8	0-8	8-0	∞	12.0	12.0	12.0	2.5
	9	0-9	9-0	∞	13.1	13.1	13.1	2.2
	10	0-10	10-0	∞	14.0	14.0	14.0	1.9

Note 1. Repeating coil losses (.7db per coil) not included.

Note 2. Return loss figures computed on the basis of a nominal trunk impedance of 800 ohms and a nominal station impedance of 200 ohms looking into the bridge from a trunk outlet. For circuit SD 66461-01 there is no distinction between trunk and station; the return loss is computed as one leg vs a parallel combination of all others (all impedances assumed equal).