

CIRCUIT DESCRIPTION

CD-96471-01  
Issue 2D  
Apparatus 6D  
SD Issue 8D  
15 May 1970

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NE-14  
OR CABLE TEST DESK NE-3.

CHANGES:

D. DESCRIPTION OF CHANGES

D.1 QA option was added in Fig. 1 to rate  
the "A2" resistor (18 EH type) manufac-  
ture Disc. since this resistor is not requi-  
red with the NS19601 L1 amplifier circuit.

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COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NO. NE-14  
OR CABLE TEST DESK NO. NE-3

CHANGES

D. DESCRIPTION OF CHANGES

- D.1 Note 304Q is added to read:  
"The arrangement for No. NE-1  
ESS using NS 19601, L1 ampli-  
fier can be used in all other  
type offices, providing the  
following figures are used -  
Fig. 1 (X or Y option), Fig.  
2 (P option), Figs. 3 and 4  
(Z option - see Note 102), Fig.  
E (option K) together with  
other common options required.  
Use CAD 2 or CAD 3, CAD 5 and  
CAD 7 for cabling information."
- D.2 Reference to Note 304Q is added to  
Notes 102, 301, 302, Figs. 4 and 5,  
CAD's 6 and 7.
- D.3 Note 301 is modified to show that  
NS 14792 loudspeaker can be used  
with NS 19601, L1 amplifier.
- D.4 Figure B and CAD 6 are rated Mfr.  
Disc.
- D.5 CAD 7 is modified to apply infor-  
mation per Note 304Q. X and W  
options are added and wiring information  
is added for connection to CAD 8, for  
ESS No. NE-1 or to Signal Supply for non-  
ESS circuits.
- D.6 Title under CAD 8 is changed from  
"No. NE-1 ESS" to read "No. NE-1  
ESS Only".

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**CIRCUIT DESCRIPTION**

CD-96471-01  
Issue 2D  
Appendix 4B  
SD Issue 6B  
8 March 1968

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NO. NE-14  
OR CABLE TEST DESK NO. NE-3

**CHANGES**

**A. CHANGED AND ADDED FUNCTIONS**

A.1 Functions 3.3 has been changed and should read:

3.3 Each talking station consists of a switch or key and one or two microphones, each having its own signal lamp. Operation of the switch or key causes the associated lamp(s) to flash at 60 ipm, lights the lamps at all other stations steadily and connects the associated microphone(s).

A.2 Function 3.5 has been changed and should read:

3.5 Side tone at the test desk is controlled by a voice operated relay or by a vario-losser in the amplifier panel.

A.3 Function 3.7 has been changed and should read:

3.7 Provides for placement of loudspeakers in any desired location except in No. NE-1 ESS offices where the location is restricted to the protector frames.

**B. CHANGES IN APPARATUS**

**B.1 ADDED**

NE-185A Networks, Q Option - Fig. 1, D and 3

Jensen P5VAC-8017 Loudspeaker, N Option - Fig. 2

NE-542C Capacitor, K Option - Fig. 1, Fig. 5

**D. DESCRIPTION OF CHANGES**

D.1 Fig. E has been added to show connecting information for the NS 19601, List 1 amplifier.

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D.2 Fig. 5 has been added to show apparatus located at ESS talking station and connecting information to Fig. 3.

D.3 In Fig. 1, the value of capacitor B1 is made optional due to the addition of Fig. E.

D.4 Contact protection networks have been added in Fig. 1, D and 3 as Standard option Q.

D.5 Ground lead E has been added in Fig. 3 to provide a return for leads C and D in Fig. 5.

D.6 The code of loudspeaker shown in Fig. 2 has been made optional.

D.7 Voltage limits has been changed to agree with No. NE-1 ESS limits of 42.75 to 52.5 volts.

D.8 Notes 101, 102, 103, 104 and 301 have been changed to reflect the above changes.

D.9 CAD 2, 3, 5 and 6 have been changed.

D.10 CAD 7, 8 and 9 have been added.

D.11 Leads A and B in Fig. B are now shown as shielded pair. This is to minimize noise pickup.

D.12 Equipment Note 203 has been added.

D.13 Information Note 302 has been added.

**F. CHANGES IN CD SECTION**

F.1 Under 4.21 of 4. CONNECTING CIRCUITS, add the following: NO. NE-1 ESS - SD-81652-01.

F.2 Under 4. CONNECTING CIRCUITS, add the following new circuits.

4.23 Application Schematic for NS 16617, List 1 Amplifier - SD-95259-01.

4.24 NS 19601, List 1 Amplifier Circuit - SD-99431-01.

Circuit Description  
Northern Electric Co. Ltd.  
Communications Systems,  
Engineering Dept.  
Montreal- Canada.

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUD SPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NO. 14  
OR CABLE TEST DESK NO. 3

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded Superseded By

Fig. C

Fig. D

(C) Relay AF 16

(C) Relay AJ 9

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Fig. C is designated and rated Mfr.  
Disc. and is superseded by Fig. D  
which is added to provide for a maximum of  
40 Figs. 3 and 4 instead of 20 Figs. 3  
and 4.

D.2 In Fig. 3 reference to Battery "B"  
or "C" is changed to "B", "C", "D",  
or "E".

D.3 Note 101 has reference to Fuse D and  
E added.

D.4 The Option Used table and Note 103 is  
changed to add reference to Figs. C  
and D.

D.5 CADS 1, 4 and 5 are changed and CAD 6  
is added.

All other headings, no change.

Circuit Description  
Northern Electric Co. Ltd.  
Communications Systems,  
Engineering Dept.  
Montreal- Canada.

CD-96471-01  
Issue 2-D  
Appendix 2-B  
Dwg. Issue 4-B

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NO. 14  
OR CABLE TEST DESK NO. 3

#### CHANGES

##### D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Note 202 is added to show the required method for wiring the "A" battery supply. Reference to Note 202 is added in Fig. 1 and Note 101.

D.2 CAD 1 is changed to agree with Note 201 and cross connections are added for connection to amplifier application schematic.

D.3 "Except for Additions" is added in the replacement box.

D.4 Fig. A is designated and rated Mfr. Disc. and is replaced by Fig. B which is added to provide connection to the amplifier application schematic.

#### 4. CONNECTING CIRCUITS

When this circuit is listed on a key sheet the connecting information thereon should be followed.

4.1 Loud Speaker Trunk Circuit -  
SD-96472-01.

4.2 Signal Supply

4.21	Panel - BCO	SD-21666-01
	Panel - GCO	SD-21667-01
	Crossbar No. 1	SD-25062-01
	Toll	SD-95078-01
	Power	SD-80771-01
	Crossbar No. 5	SD-25814-01
	Step-by-Step	SD-31606-01

4.22 Power Ringing Circuit

4.23 Application Schematic for KS-16617L1  
Amplifier - SD-95259-01.

All other headings, no change.

Circuit Description  
Northern Electric Co. Ltd.  
Communications Systems,  
Engineering Dept.  
Montreal- Canada.

CD-96471-01  
Issue 2-D  
Appendix 1-D  
Dwg. Issue 3-D

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
CENTRAL OFFICE END  
FOR USE WITH LOCAL TEST DESK NO. 14  
OR CABLE TEST DESK NO. 3

#### CHANGES

##### D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The title of this circuit is changed,  
it formerly read:

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUDSPEAKER  
LOCAL TEST DESK NO. 14  
CABLE TEST DESK NO. 3

D.2 The replacement box is changed, it  
formerly read: "Replacing but not  
interchangeable with SD-90222-01."

D.3 Cross connections are changed to  
agree with changes on this issue.

All other headings, no change.

Circuit Description  
Northern Electric Co. Ltd.  
Communications Systems,  
Engineering Dept.  
Montreal- Canada.

CD96471-01  
Issue 2D  
Dwg. Issue 2D

COMMON SYSTEMS  
TELEPHONE CIRCUIT  
MDF LOUD SPEAKER  
LOCAL TEST DESK NO. 14  
CABLE TEST DESK NO. 3

CHANGES

B. CHANGES IN APPARATUS

B.1 Added

"R" Option  
(C) 18 T Resistor 500  
(C) 2uf Capacitor

B.2 Superseded Superseded By

"T" Option "S" Option  
AF51 Relay (F) AF59 Relay (F)

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The replacement box is changed. It formerly read: "Replacing SD90222-01."

D.2 Note 104 is added with reference at bracket in Fig. 1 to clarify the connections to "Signal Supply."

D.3 Option "T" is designated and rated Mfr. Disc. and is superseded by Option "S" which is added to agree with the Cbr. No. 5 Interrupter Circuit.

D.4 Option "R" is added to provide for contact protection when this circuit connects to the signalling circuit 30, 60 or 120 IPM.

D.5 Note 105 is added and the Option Used table is changed with reference to Options "R", "S" and "T" which are added on this issue.

D.6 Note 102 is changed with reference to Option "R."

D.7 Cross connections are changed to agree with changes on this issue.

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

1.1 This circuit provides the central office end of a loud speaker communication system between the Local Test Desk No. 14 or Cable Test Desk No. 3 and distributing frames in the central office.

2. WORKING LIMITS

2.1 Relay L

Max. Ext. Ckt. Res. 3000  
Min. Ins. Res. 30,000

3. FUNCTIONS

3.1 Provides two-way loop signaling between this circuit and a loud speaker trunk at the test desk.

3.2 Provides two-way amplified speech transmission.

3.3 Each talking station consists of a switch or key and two microphones each having its own signal lamp. Operation of the switch or key causes the associated lamps to flash at 60 IPM, lights the lamps at all other stations steadily and connects the associated microphones.

3.4 A 120 IPM flash indicates an incoming call.

3.5 Side tone at the test desk is controlled by a voice operated relay in the amplifier panel.

3.6 The transmission path to the test desk may be transferred to another station by the operation of the associated switch or key.

3.7 Provides for placement of receivers in any desired location.

4. CONNECTING CIRCUITS

When this circuit is listed on a key sheet the connecting information thereon should be followed.

4.1 Loud Speaker Trunk Circuit - SD96472-01

4.2 Signal Supply

4.2.1 Panel - BCO	SD21666-01
Panel - GCO	SD21667-01
Crossbar No. 1	SD25062-01
Toll	SD95078-01
Power	SD80771-01
Crossbar No. 5	SD25814-01
Step-by-Step	SD31606-01

4.2.2 Power Ringing Circuit

5. DESCRIPTION OF OPERATION

5.1 Incoming Call

5.1.1 Call Originated

Operation of a key at the test desk connects a bridge across the T and R conductors to operate L.

**L Operated:**

- (1) Bridges resistance A across the T1 and R1 conductors which causes closure of the talking path at the test desk through the amplifier to the loud speakers.
- (2) Closes, in part, a holding path for CT.
- (3) Operates Ll.

Closes ground to lead "STO" or lead "ST" with "W" option to start the interrupter where required.

Ll operated disconnects its holding path for CT and connects 120 IPM to F under control of C.

F follows the interruptions and flashes all station lamps at 120 IPM under control of C.

**5.12 Call Answered**

Operation of the switch or key at any station operates the associated CT relay.

**CT Operated:**

- (1) Closes its holding path under control of L.
- (2) Closes the talking path through the amplifier to the test desk.
- (3) Switches the associated lamps to control of F.
- (4) Opens the holding battery path to preceding CT relays (lead 8).
- (5) Opens the holding ground path to succeeding CT relays (lead 4).
- (6) Disconnects ground from lead STO or ST with "W" option of the signal supply.
- (7) Operates C.

**C Operated:**

- (1) Provides an additional closure for the bridge to the test desk.
- (2) Lights all lamps steadily except at the connected station.
- (3) Connects ground to lead "ST" to start the interrupter.
- (4) Connects 60 IPM to F.

F follows the interruptions and flashes the connected station lamps at 60 IPM.

**5.13 Transfer to Another Station**

Operation of the switch or key at another station operates the associated CT.

**CT Operated:**

- (1) Opens the holding battery path to preceding CT relays.
- (2) Opens the holding ground path to succeeding CT relays.

The preceding or succeeding station is released and permits CT to perform its functions as described in paragraph 5.12.

**5.14 Disconnect**

When the circuit is disconnected at the test desk L releases.

**L Released:**

- (1) Opens its bridge to the test desk.
- (2) Releases CT.
- (3) Opens the operating path for Ll.

Ll (slow release) holds operated long enough to insure the release of CT before holding ground is restored.

Ll released disconnects the 120 IPM supply.

**CT Released:**

- (1) Opens the talking path to the test desk.
- (2) Restores the lamps to control of C.
- (3) Releases C.

**C Released:**

- (1) Opens the bridge to the test desk.
- (2) Disconnects the 60 IPM supply.
- (3) Restores the lamp circuit to normal.

**5.2 Outgoing Call****5.21 Call Originated**

Operation of the switch or key at any station operates the associated CT relay.

**CT Operated:**

- (1) Closes its holding path.
- (2) Closes the talking path to the test desk.
- (3) Switches the associated lamps to control of F.
- (4) Opens the holding battery path to preceding CT relays.
- (5) Opens the holding ground path to succeeding CT relays.



(6) Operates C.

C Operated:

- (1) Bridges resistance A across the T1 and R1 conductors to signal the test desk.
- (2) Lights all station lamps steadily except at the connected station.
- (3) Connects ground to lead "ST" to start the interrupter.
- (4) Connects 60 IPM to F.

F follows the interruptions and flashes the connected station lamps at 60 IPM.

5.22 Call Answered

When the test desk answers, the talking path to the loud speakers is closed and a bridge across the T and R conductors operates L.

L operated, provides an additional bridge across the T1 and R1 conductors, closes a holding path for CT and operates Ll.

Ll operated, opens its holding path for CT.

5.23 Transfer or Disconnect

Transfer or disconnect is accomplished as described in paragraphs 5.13 and 5.14.