DIMENSION® PBX
CODE CALLING (CHIME PAGING)
TESTS

CONTENTS

---

1. GENERAL INFORMATION

1.1 DESCRIPTION

1.1.1 This section describes the tests to be performed whenever Code Calling (Chime paging) is provided, both for 201S and 201L.

1.1.2 This feature is available for the DIMENSION PBX in feature packages 8, 10, and 12. Attendants, station users, and tie trunks can dial an access code and a 2 or 3 digit called party code to activate an electronic chime which corresponds to the called party code. The called party can then be connected to the calling party by dialing an answering code from any station within the DIMENSION PBX.

Printed in U.S.A.

Private

2.   RECORDS AND REQUIREMENTS

2.1   RECORDS

2.1.1   Form SD-97-1313 is required for recording the results of these tests.

3.   TEST EQUIPMENT FOR 201S AND 201L

AMT.	ITE	DESCRIPTION
1	4208A	Telephone handset
1	9153L	Cord Assembly
1	500D	
	or	
	2500D	Telephone
1	249A	Adapter

4.   PROCEDURE (201S)

> NOTE: The difference between LC17 and LC17B is that; when using LC17, you will hear the Chimes over the background music (if provided). But, with LC17B the music will be interrupted completely while the chime paging is in process.

4.1.1   Determine Dial Access Code for Code Calling and Code Calling Answerback Dial Code by referring to Trunk Group Assignments in COD.

4.1.2   Select Code Call Party Idenfification Number with correct number of digits.

> NOTE: Party Identification Number may consist of any combination of digits 1 thru 5.

4.1.3   Connect handset to Test Line, and set switch to MON.

4.1.4   Connect telephone set to station line having Code Calling access, and go off-hook; dial Code Calling access code, there should be dial tone present. Otherwise refer to Trouble Shooting Aids, step 6.

4.1.5   Dial selected Code Called Party Identification Number;

A) This will cut the background music off. If the customer is using his equipment to broadcast background music while the equipment is not being used for Chime Paging.

B) There will be three cycles of chime signals corresponding to dialed party identification.

4.1.6   At the handset set the switch to TALK, and dial Code Calling Answerback Code. There should be dial tone. Otherwise refer to Trouble Shooting Aids, step 6.

4.1.7   Dial selected Code Called Party Identification Number; Confirmation tone should be heard, and connection will be established between handset and telephone set.

4.1.8   Set the switch to MON, and at the telephone set go on-hook .

4.1.9   At the telephone set go off-hook, and dial Code Calling Access Code. There should be dial tone present.

4.1.10   Dial selected Code Calling Party Identification Number and go on-hook immediately following confirmation tone. There should be three cycles of Chime present (heard). Otherwise refer to Trouble Shooting Aids, step 6.

4.1.11   At handset set switch to TALK, and dial Code Calling Answerback Code. Intercept tone should be heard (within 10 seconds). Otherwise refer to Trouble Shooting Aids, step 6.

4.1.12   Set switch to MON. Is Code Calling circuit to be busied-out at customer equipment and then tested? If it is not, then at PBX Cabinet disconnect test equipment, and this concludes the test. But, if the answer is yes, go to 4.1.13.

4.1.13   At customer-provided equipment:

                 A) Request customer to set BUSY/IDLE switch to BUSY.
                 B) At telephone set go off-hook, and listen for dial tone.
                 C) Dial tone Calling Access Code, and should hear busy tone. Otherwise refer to Trouble Shooting Aids step 6.
                 D) Set BUSY/IDLE switch to IDLE.

                 This concludes the test, disconnect test equipment.

5.   PROCEDURE (201L)

NOTE: In 201L LC17B is only used.

5.1.1   Determine Dial Access Code for Code Calling by referring to Trunk Group
Assignments in COD and Code Calling Answerback Dial Code by referring to Dial
Access Code Assignments in COD.

5.1.2   Select Code Call Party Idenfification Number with correct number
of digits.

NOTE: Party Identification Number may consist of any combination
of digits 1 thru 5.

5.1.3   Connect handset to Test Line, and set switch to MON.

5.1.4   Connect telephone set to station line having Code Calling access, and
go off-hook; dial Code Calling access code, there should be dial tone
present. Otherwise refer to Trouble Shooting Aids, step 7.

5.1.5   Dial selected Code Called Party Identification Number;

A) This will cut the background music off. If the customer is using
his equipment to broadcast background music while the equipment
is not being used for Chime Paging.

B) There will be three cycles of chime signals corresponding to dialed
party identification.

5.1.6   At the handset set the switch to TALK, and dial Code Calling Answerback Code. There should be dial tone. Otherwise refer to Trouble Shooting Aids, step 7.

5.1.7   Dial selected Code Called Party Identification Number; Confirmation tone should be heard, and connection will be established between handset and telephone set.

5.1.8   Set the switch to MON, and at the telephone set go on-hook .

5.1.9   At the telephone set go off-hook, and dial Code Calling Access Code. There should be dial tone present.

5.1.10   Dial selected Code Calling Party Identification Number and go on-hook immediately following confirmation tone. There should be three cycles of Chime present (heard). Otherwise refer to Trouble Shooting Aids, step 7.

5.1.11   At handset set switch to TALK, and dial Code Calling Answerback Code. Dial tone is received. Dial Selected Code Calling Party Identification Number. Otherwise, refer to Trouble Shooting Aids, step 7.

5.1.12   Set switch to MON. Is Code Calling circuit to be busied-out at customer equipment and then tested? If it is not, then at PBX Cabinet disconnect test equipment, and this concludes the test. But, if the answer is yes, go to 5.1.13.

5.1.13   At customer-provided equipment:

         A) Request customer to set BUSY/IDLE switch to BUSY.
         B) At telephone set go off-hook, and listen for dial tone.
         C) Dial tone Calling Access Code, and should hear busy tone. Otherwise refer to Trouble Shooting Aids step 7.
         D) Set BUSY/IDLE switch to IDLE.

         This concludes the test, disconnect test equipment.

6.   TROUBLE SHOOTING AIDS (201S)

6.1   There are 9 possible things that can go wrong:

A) The intercept tone heard when Code Calling Access Code is dialed. See paragraph 6.2.

B) Busy signal received on all attempts to use Code Calling feature See paragraph 6.3.

C) Intercept tone heard after Code Called Party Identification Number dialed. See paragraph 6.4.

D) Chime tone not heard. See paragraphs 6.5.1 through 6.5.12.

E) Chime tone distorted or low level. See paragraphs 6.6.1 through 6.6.5.

F) Customer provided Code Calling Chime equipment remains energized after chime cycle is completed. See paragraphs 6.7.1, 6.7.2.

G) Intercept tone heard when Answerback Code is dialed. See paragraphs 6.7.3 through 6.7.5.

H) Customer cannot busy-out Code Calling circuit. See paragraphs 6.8.1 through 6.8.7.

I) Code Calling call processing troubles (excluding troubles mentioned above). See paragraph 6.9.

6.2   For which stations does Code Calling fail?

a) For all stations allowed to use Code Calling. See paragraphs 6.2.1 through 6.2.6.

b) For stations in more than one class of service. See paragraphs 6.2.2 through 6.2.6.

c) All station(s) in only one class of service. See paragraph 6.2.7.

d) Only one station (Code Calling is OK for other stations in same class of service). See paragraph 6.2.6.

6.2.1   Check PROC. NO. 13 to determine if proper trunk type encode has been assigned to Code Calling circuit trunk group (enter trunk group number in field 1). Make sure that encode 53 is displayed in field 2. If encode 53 is displayed in field 2, and problem still exists, then go to 6.2.2. But, if encode 53 is not displayed in field 2, then change Trunk type. This ends the correction.

6.2.2   Check PROC. NO. 12 to determine if correct Dial Access Code has been assigned to Code Calling Circuit (enter the Dial Access Code in field 2). If the data in PROC. NO. 12 is not correct, change the assignment of Dial Access Code. This concludes the correction. Otherwise go to 6.2.3.

6.2.3   Check PROC. NO. 29, WORD 1, to determine if first digit is correctly administered (enter first digit in field 1). If the data in PROC. NO. 29, WORD 1 is not correct, change administration of first digit. This ends the correction. Otherwise go to 6.2.4.

6.2.4   Check PROC. NO. 14 to determine if Code Calling Dial Access Code is assigned to correct miscellaneous trunk restriction group(s) (enter Dial Access Code in field 1). If the data in PROC. NO. 14 is not correct, change miscellaneous trunk restriction group assignment. This ends the correction. Otherwise go to 6.2.5.

6.2.5   If there is more than one station in this class of service, reinitialize the system (see Note below); and if the problem still is present, then assume that the trouble is in software (see step 6.10). This concludes the correction. Otherwise go to 6.2.6.

NOTE: Notify attendant that reinitialization will interrupt service and may cancel attendant or station administered features activated, deactivated or changed within the past 23 hours.

6.2.6   Check PROC. NO. 00, WORD 1 to determine if station is assigned to correct class of service (enter extension number in field 1). If the data in PROC. NO. 00, WORD 1 is not correct, change station class of service. END. Otherwise reinitialize the system (see note in paragraph 6.2.5). If this clears the problem, then it is the end of correction. If trouble still exists, assume trouble in software (see step 6.10). END.

6.2.7   Check PROC. NO. 02, WORD 2 to determine if correct miscellaneous trunk restriction group(s) have been assigned to class of service (enter class-of-service number in field 1). If the data in PROC. NO. 02, WORD 2 is not correct, change miscellaneous trunk restriction group assignment. Otherwise refer to 6.2.4 through 6.2.6.

6.3   If Busy signal is received on all attempts to use Code Calling feature; then go to 6.3.1. Otherwise the trouble could be any one of C through I sub-paragraphs in paragraph 6.1.

6.3.1   Check to see if BUSY/IDLE switch is set at IDLE at customer-provided equipment; if not request customer to set BUSY/IDLE switch to IDLE. END. If it is set at IDLE, go to 6.3.2.

6.3.2   At PBX cabinet 0, unseat LC17B (or LC17) in slot 07 of line carrier 00.

6.3.3   At 89A Control Unit, remove the cover to expose BSY1, and BSY2 screw terminals.

6.3.4   Using DMM (Table A), measure resistance between BSY1, and BSY2 terminals. If it measures greater than 1K OHMS, replace LC17B (or LC17) at PBX cabinet O, in slot 07 of line carrier 00 and retry the Code Calling test. If the trouble still exists, install the original LC17B (or LC17) back in slot 07 of line carrier 00 at PBX cabinet 0, and assume trouble is in wiring between LC17B (or LC17) and 89A Control Unit (refer to section 250.23 in handbook 282 for wiring information, and SD-1E445-01). END. Otherwise, install 89A's cover. END.

Table A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
Digital Multi-Meter (DMM)	KS-20599, L4
Circuit Pack or Equipment that may be required: LC17B (or LC17) 89A Control Unit 2012B Transformer	

6.3.5   If the resistance measured between BSY1, and BSY2 is less than 1K OHMS, at PBX Cabinet 0, install LC17B (or LC17) in slot 07 of line carrier 00.

6.3.6   Using DMM (Table A, paragraph 6.3.4) measure DC voltage between COS1, and COS2 terminal on 89A Control Unit. If the DC voltage is not approximately -12 volts, assume trouble is in BUSY/IDLE circuit in customer-provided equipment or associated wiring (refer to section 250.23 in handbook 282, and SD-1E445-01). END.

6.3.7   If the DC voltage measured between COSI and COS2 terminals is approximately
          -12 volts; then:

          a) At 117-volt AC outlet, disconnect 2012B transformer (associated
             with 89A Control Unit) from outlet.
          b) At 89A Control Unit disconnect and tag external wiring at screw
             terminal, and replace 89A Control Unit. Connect external wiring
             to screw terminals.
          c) Rotate switch screws S1, S2, and S3 (Fig 1) fully clockwise, and at
             117-volt AC outlet reconnect 2012B Transformer to outlet.

6.3.8   Try Code Calling test call again. If the trouble is not cleared, repeat
          paragraphs 6.3.6 and 6.3.7 to install the original 89A Control Unit.
          Assume trouble is in wiring between LCl7B (or LCl7) and 89A Control
          Unit (refer to section 250.23 handbook 282, and SD-1E445-01). END.

6.4   Check PROC. NO. 21, WORD 5 to determine if Code Call Digits are
          properly administered. If the number of Code Call Digits is correct,
          reinitialize the system (refer to note in paragraph 6.2.5). If it does
          not clear the trouble, assume trouble is in software, (see step 6.10).
          END. But if the number of Code Call Digits is not correct, then
          change number of Code Call Digits. END.

6.5.1   At 89A Control Unit, remove its cover, and connect the handset to
          TIP(T) and RING(R) screw terminal. Also, set switch to MON at the
          handset, and monitor signal while making Code Calling test call. If
          the Chime tone was not heard then go to 6.5.2. Otherwise go to 6.5.3.

6.5.2   At Cabinet 0, replace LCl7B (or LCl7) in slot 07 in line Carrier 00.
          Also, at handset monitor signal while making Code Calling test call.
          If Chime tone is still not heard, then at the Cabinet 0, install the original
          LCl7B (or LCl7) in slot 07 of Line Carrier 00. Assume the trouble is
          in software (see step 6.10), or wiring (see SD-1E445-01). END. But, if the
          chime tone is heard, then disconnect the handset from 89A Control Unit, and
          89A's cover. END.

6.5.3   At 117-volt AC outlet, disconnect 2012B Transformer from outlet.
          At 89A Control Unit, disconnect handset, and disconnect leads from
          CT and CR screw terminals.

6.5.4.   At 117-volt AC outlet connect 2012B Transformer to outlet. At handset,
          set switch to MON and connect handset to CR and CT screw terminals.
          Monitor signal while making Code Calling test call. If the Chime tone
          is heard then go to 6.5.5. Otherwise go to 6.5.11.

6.5.5   Disconnect handset from 89A Contol Unit. At customer-provided equipment, request customer to remove power from equipment. Also, at 89A Control Unit, disconnect leads from CBS1, and CBS2 screw terminals. Using DMM (Table A in paragraph 6.3.4), measure resistance between CBS1 and CBS2 screw terminals, while making Code Calling test call. If the resistance decreases to less than 30 OHMs several times during test call, then go to 6.5.6. Otherwise go to 6.5.7.

6.5.6   At 117-volt AC outlet, disconnect 2012B transformer. Reconnect leads to CT, CR, CBS1, and CBS2 screw terminals on 89A Control Unit. Put 89A Unit's cover back on, and connect 2012B transformer to 117-volt AC outlet. Assume the trouble is in customer-provided equipment or wiring between 89A Control Unit and customer-provided equipment (refer to SD-1E445-01). END.

6.5.7   Do the following in order:

1 - At 117-volt AC outlet, disconnect 2012B Transformer from outlet.
2 - At 89A Control unit, reconnect leads to CT, CR, CBS1, and CBS2 screw terminal.
3 - At 117-volt AC outlet, connect 2012B transformer from outlet.
4 - At cabinet 0, unseat LC17B (or LC17) in slot 07 in Line Carrier 00.
5 - At 89A Control Unit, disconnect leads from PG1, and PG2 screw terminals.
6 - At Cabinet 0, install LC17B (or LC17) in slot 07 in Line Carrier 00.
7 - At 89A Control Unit, using DMM, measure DC voltage between leads disconnected from PG1 and PG2 while making Code Calling test call.

If the voltage change from 0 volts to -48 volts several times during test call, then go to 6.5.8. Otherwise go to 6.5.10.

6.5.8   At 117-volt AC outlet, disconnect 2012B from outlet. At 89A Control Unit disconnect and tag external wiring at screw terminal. Replace 89A Control Unit, and reconnect the external wiring to the proper screw terminal.

6.5.9   Rotate switch screw S1, S2, and S3 (Fig. 1) fully clockwise (circuit closed). Install 89A's cover and at 117-volt AC outlet, connect 2012B transformer to outlet. At customer-provided equipment request the customer apply power to his equipment. END.

6.5.10   At customer-provided equipment, request the customer to apply power
to his equipment. Also, do the following in order:

1.   At Cabinet 0, remove LC17B (or LC17) from slot 07 in Line Carrier 00.

2.   At 89A Control unit; reconnect leads to PG1, and PG2 screw terminals,
and install the 89A's cover.

3.   At Cabinet 0, install new LC17B (or LC17) in slot 07 in Line Carrier
00.

Make Code Calling test call. If the chime was heard; this will end
the correction. Otherwise, at Cabinet 0, install the original LC17B
(or LC17) in slot 07 in Line Carrier 00. Assume trouble in software (see step 6.10),
or wiring (refer to SD-1E445-01). END.

6.5.11   At 89A Control Unit; disconnect handset. Using DMM, measure AC
voltage between AC1 and AC2 screw terminals. If DMM measures
from 15 to 18 volts AC, go to 6.5.12. Otherwise, at the 117-volt AC
outlet, replace 2012B transformer. END.

6.5.12   Do the following in sequence:

1.   At 117-volt AC outlet; disconnect 2012B transformer.

2.   At 89A Control Unit; disconnect and tag external wiring, and
replace 89A Control Unit.

3.   Connect external wiring to the new 89A Control Unit.

4.   Rotate switch screws S1, S2, and S3 (Fig. 1) fully clockwise.

5.   At 117-volt AC outlet; connect 2012B transformer to outlet.

6.   Install the 89A Control Unit's cover.

7.   END.

6.6.1   At 89A Control Unit; remove the cover. At handset set the switch
to MON, and connect it to CT, and CR screw terminals on 89A.

6.6.2   Monitor signal while making Code Calling test call. If the proper chime
tone is heard, then assume that trouble is in customer-provided equipment.
END. Otherwise go to 6.6.3.

6.6.3   Disconnect handset from 89A. Remove 89A's cover and connect handset
           to CT and CR screw terminal. At handset, monitor signal while making
           Code Calling test call. If proper chime tone is heard go to 6.6.4. Otherwise,
           go to 6.6.5.

6.6.4   Disconnect handset from 89A unit. At customer-provided equipment,
           request the customer to remove power from equipment, and then follow paragraphs
           6.5.8 and 6.5.9.

6.6.5   At Cabinet 0, replace LCl7B (or LCl7) in slot 07 in Line Carrier 00. Monitor
           signal while making Code Calling test call. If proper chime tone was
           heard; it ends the correction. Otherwise, at Cabinet 0, replace LCl7B
           (or LCl7) in slot 07 in line carrier 00, and assume trouble is in wiring
           (SD-1E445-01). END.

6.7.1   At Cabinet 0, replace LCl7B (or LCl7) in slot 07 in Line Carrier 00, and
           make Code Calling test call. If the customer-provided equipment turned
           off after chime cycles are completed, then the correction is done. Otherwise,
           go to 6.7.2.

6.7.2   Do the following in sequence:

           1. At Cabinet 0, install the original LCl7B (or LCl7) in slot 07 in Line
              Carrier 00.

           2. At customer-provided equipment; request customer remove power
              from equipment.

           3. Remove 89A's cover, and disconnect leads from CBS1 and CBS2.
              Screw terminals.

           Using DMM, measure resistance betwen CBS1 and CBS2 screw terminals.
           If the resistance measured is not less than 30 OHMS, then, assume trouble
           is in customer provided equipment or wiring, and this ends the correction.
           Otherwise, remove 89A's cover and follow paragraphs 6.5.8 and 6.5.9.
           END.

6.7.3   Check PROC. NO. 29, WORD 2 to determine if correct answerback Dial
           Code has been assigned to Code Calling (enter encode 18 in field 1). If
           the data in PROC. NO. 29, WORD 2 is not correct, change answerback
           Dial Code. This will end the correction. Otherwise, go to 6.7.4.

6.7.4   Check PROC. NO. 29, WORD 1, to determine if first digit is correctly
         administered (enter the first digit in field 1). If the data in PROC. NO.
         29, WORD 1 is not correct, change administration of first digit. This will
         end the correction. Otherwise, go to 6.7.5.

6.7.5   Reinitialize (see note in paragraph 6.2.5) the system; if this clears the
         trouble, this will end the correction procedure. Otherwise, assume trouble
         is in software (see step 6.10). END.

6.8.1   Do the following in order:

         1. At customer-provided equipment; request the customer to get
         BUSY/IDLE switch to BUSY.

         2. At 117-volt AC outlet; disconnect 2012B transformer from outlet,
         and remove its cover.

         3. Using DMM, measure resistance between COS1 and COS2.

         If the measured resistance is not approximately 0 OHMs, then at 117-
         volt AC outlet, connect 2012B to outlet. Assume trouble is in customer-
         provided equipment or wiring. This ends the correction. Otherwise go
         to 6.8.2.

6.8.2.   At 117-volt AC outlet, connect 2012B transformer to outlet. Also, at
         cabinet 0, unseat LC17B (or LC17) in slot 07 in Line Carrier 00, and remove
         89A's cover.

6.8.3   Using DMM, measure resistance between BSY1, and BSY2 screw terminals.
         If the resistance measured is not less than 30 OHMs go to 6.8.4. Otherwise
         go to 6.8.5.

6.8.4   At customer-provided equipment, request customer to remove power
         from his equipment. Also, at Cabinet 0, install LC17B (or LC17) in slot
         07 in Line Carrier 00, and follow paragraphs 6.5.8 and 6.5.9. END.

6.8.5   Install 89A's cover and at Cabinet 0, replace LC17B (or LC17) in slot
         07 of Line Carrier 00.

6.8.6   Make Code Calling test call. If the Code Calling circuit is busy, then
         at customer-provided equipment, request the customer to set BUSY/IDLE
         switch to IDLE. This ends the correction. Otherwise go to 6.8.7.

6.8.7   At Cabinet 0, install the original LC17B (or LC17) in slot 07 in Line Carrier
         00, and assume the trouble is in wiring between LC17B (or LC17) and
         89A Control Unit (refer to section 250.23 in handbook 282 and SD-1E445-
         01). END.

6.9   Reinitialize the system (see note in paragraph 6.2.5). If this clears the trouble then this ends the correction procedure. Otherwise, assume the trouble is in software (see step 6.10). END.

6.10   For troubleshooting in software, contact RTAC engineer.

7.   TROUBLE SHOOTING AIDS (201L)

7.1 · There are 9 possible things that can go wrong:

A) The intercept tone heard when Code Calling Access Code is dialed. See paragraph 7.2.

B) Busy signal received on all attempts to use Code Calling feature See paragraph 7.3.

C) Intercept tone heard after Code Called Party Identification number dialed. See paragraph 7.4.

D) Chime tone not heard. See paragraphs 7.5.1 through 7.5.12.

E) Chime tone distorted or low level. See paragraphs 7.6.1 through 7.6.5.

F) Customer provided Code Calling Chime equipment remains energized after chime cycle is completed. See paragraphs 7.7.1, 7.7.2.

G) Intercept tone heard when Answerback Code is dialed. See paragraphs 7.7.3 through 7.7.5.

H) Customer cannot busy-out Code Calling circuit. See paragraphs 7.8.1 through 7.8.7.

I) Code Calling call processing troubles (excluding troubles mentioned above). See paragraph 7.9.

7.2   For which stations does Code Calling fail?

a) For all stations allowed to use Code Calling. See paragraphs 7.2.1 through 7.2.6.

b) For stations in more than one class of service. See paragraphs 7.2.2 through 7.2.6.

c) All station(s) in only one class of service. See paragraph 7.2.7.

d) Only one station (Code Calling is OK for other stations in same class of service). See paragraph 7.2.6.

7.2.1   Check PROC. NO. 100 to determine if proper trunk type encode has been assigned to Code Calling circuit trunk group (enter trunk group number in field 1). Make sure that encode 53 is displayed in field 5. If encode 53 is displayed in field 5, and problem still exists, then go to 7.2.2. But if encode 53 is not displayed in field 5, then change Trunk type. This ends the correction.

7.2.2   Check PROC. NO. 100 to determine if correct Dial Access Code has
             been assigned to Code Calling Circuit (enter the Dial Access Code
             in fields 2, 3, and 4). If the data in PROC. NO. 100 is not correct, change the
             assignment of Dial Access Code. This concludes the correction.
             Otherwise go to 7.2.3.

7.2.3   Check PROC. NO. 350, WORD 1, to determine if first digit is correctly
             administered (enter first digit in field 1). If the data in PROC. NO.
             350, WORD 1 is not correct, change administration of first digit.
             This ends the correction. Otherwise go to 7.2.4.

7.2.4   Check PROC. NO. 102 to determine if Code Calling Dial Access Code
             is assigned to correct miscellaneous trunk restriction group(s) (enter
             Dial Access Code in fields 1, 2, and 3). If the data in PROC. NO. 102 is not
             correct, change miscellaneous trunk restriction group assignment.
             This ends the correction. Otherwise go to 7.2.5.

7.2.5   If there is more than one station in this class of service, reinitialize
             the system (see Note below); and if the problem still is present, then
             assume that the trouble is in software (see step 7.11). This concludes
             the correction.   Otherwise go to 7.2.6.

             NOTE: Notify attendant that reinitialization will interrupt
                    service and may cancel attendant or station administered
                    features activated, deactivated or changed within the past
                    23 hours.

7.2.6   Check PROC. NO. 000, WORD 1 to determine if station is assigned
             to correct class of service (enter extension number in field 1). If
             the data in PROC. NO. 000, WORD 1 is not correct, change station
             class of service. END. Otherwise reinitialize the system (see note
             in paragraph 7.2.5). If this clears the problem, then it is the end
             of correction. If trouble still exists, assume trouble in software (see step
             7.11). END.

7.2.7   Check PROC. NO. 010, WORD 2 to determine if correct miscellaneous
             trunk restriction group(s) have been assigned to class of service
             (enter class-of-service number in field 1). If the data in PROC.
             NO. 010, WORD 2 is not correct, change miscellaneous trunk restriction
             group assignment. Otherwise refer to 7.2.4 through 7.2.6.

7.3   If Busy signal is received on all attempts to use Code Calling feature;
             then go to 7.3.1. Otherwise the trouble could be any one of C through
             I sub-paragraphs in paragraph 7.1.

7.3.1   Check to see if BUSY/IDLE switch is set at IDLE at customer-provided
         equipment; if not, request customer to set BUSY/IDLE switch to IDLE.
         END. If it is set at IDLE, go to 7.3.2.

7.3.2   At PBX cabinet unseat LC17B from its slot (see step 7.10).

7.3.3   At 89A Control Unit, remove the cover to expose BSY1, and BSY2 screw
         terminals.

7.3.4   Using DMM (Table A), measure resistance between BSY1, and BSY2
         terminals. If it measures greater than IK OHMS, replace LC17B
         and retry the Code Calling test. If the trouble still exists, install the original
         LC17B back in its slot at PBX cabinet and assume trouble is in wiring between LC17B
         and 89A Control Unit (refer to section 250.23 in handbook 282 for wiring information,
         and SD-1E480-01). END. Otherwise, install 89A's cover. END.

Table A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
Digital Multi-Meter (DMM)	KS-20599, L4
Circuit Pack or Equipment that may be required: LC17B 89A Control Unit 2012B Transformer	

7.3.5   If the resistance measured between BSY1, and BSY2 is less than IK OHMS,
         at PBX Cabinet install LC17B in the carrier.

7.3.6   Using DMM (Table A paragraph 7.3.4) measure DC voltage between
         COS1, and COS2 terminal on 89A Control Unit. If the DC voltage is
         not approximately -12 volts, assume trouble is in BUSY/IDLE
         circuit in customer-provided equipment or associated wiring (refer
         to section 250.23 in handbook 282, and SD-1E480-01). END.

7.3.7   If the DC voltage measured between COS1 and COS2 terminals is approximately -12 volts; then:

a) At 117-volt AC outlet, disconnect 2012B transformer (associated with 89A Control Unit) from outlet.
b) At 89A Control Unit disconnect and tag external wiring at screw terminal, and replace 89A Control Unit. Connect external wiring to screw terminals.
c) Rotate switch screws S1, S2, and S3 (Fig 1) fully clockwise, and at 117-volt AC outlet reconnect 2012B Transformer to outlet.

7.3.8   Try Code Calling test call again. If the trouble is not cleared, repeat paragraphs 7.3.6 and 7.3.7 to install the original 89A Control Unit. Assume trouble is in wiring between LC17B and 89A Control Unit (refer to section 250.23 handbook 282, and SD-1E480-01). END.

7.4   Check PROC. NO. 275, WORD 4 to determine if Code Call Digits are properly administered. If the number of Code Call Digits is correct, reinitialize the system (refer to note in paragraph 7.2.5). If it does not clear the trouble, assume trouble is in software (see step 7.11). END. But, if the number of Code Call Digits is not correct, then change number of Code Call Digits. END.

7.5.1   At 89A Control Unit, remove its cover, and connect the handset to TIP(T) and RING(R) screw terminal. Also, set switch to MON at the handset, and monitor signal while making Code Calling test call. If the Chime tone was not heard then go to 7.5.2. Otherwise go to 7.5.3.

7.5.2   At PBX Cabinet replace LC17B (see step 7.10). Also, at handset monitor signal while making Code Calling test call. If Chime tone is still not heard, then at the PBX Cabinet, install the original LC17B in the carrier (see step 7.10). Assume the trouble is in software (see step 7.11), or wiring (see SD-1E480-01). END. But, if the chime tone is heard, then disconnect the handset from 89A Control Unit, and 89A's cover. END.

7.5.3   At 117-volt AC outlet, disconnect 2012B Transformer from outlet. At 89A Control Unit, disconnect handset, and disconnect leads from CT and CR screw terminals.

7.5.4   At 117-volt AC outlet connect 2012B Transformer to outlet. At handset, set switch to MON and connect handset to CR and CT screw terminals. Monitor signal while making Code Calling test call. If the Chime tone is heard then go to 7.5.5. Otherwise go to 7.5.11.

7.5.5   Disconnect handset from 89A Contol Unit. At customer-provided equipment,
          request customer to remove power from equipment. Also, at 89A Control
          Unit, disconnect leads from CBS1, and CBS2 screw terminals. Using
          DMM (Table A in paragraph 7.3.4), measure resistance between CBS1
          and CBS2 screw terminals, while making Code Calling test call. If
          the resistance decrease to less than 30 OHMs several times during test
          call, then go to 7.5.6. Otherwise go to 7.5.7.

7.5.6   At 117-volt AC outlet, disconnect 2012B transformer. Reconnect leads
          to CT, CR, CBS1, and CBS2 screw terminals on 89A Control Unit. Put
          89A Unit's cover back on, and connect 2012B transformer to 117-volt
          AC outlet. Assume the trouble is in customer-provided equipment or
          wiring between 89A Control Unit and customer-provided equipment
          (refer to SD-1E480-01). END.

7.5.7   Do the following in order:

          1 - At 117-volt AC outlet, disconnect 2012B Transformer from outlet.
          2 - At 89A Control unit, reconnect leads to CT, CR, CBS1, and CBS2
          screw terminal.
          3 - At 117-volt AC outlet, connect 2012B transformer from outlet.
          4 - At PBX cabinet unseat LC17B from its slot (see step 7.10).
          5 - At 89A Control Unit, disconnect leads from PG1, and PG2 screw
          terminals.
          6 - At PBX Cabinet install LC17B in its slot (see step 7.10).
          7 - At 89A Control Unit, using DMM, measure DC voltage between
          leads disconnected from PG1 and PG2 while making Code Calling test
          call.

          If the voltage change from 0 volts to -48 volts several times during test call, then
          go to 7.5.8. Otherwise go to 7.5.10.

7.5.8   At 117-volt AC outlet, disconnect 2012B from outlet. At 89A Control
          Unit disconnect and tag external wiring at screw terminal. Replace
          89A Control Unit, and reconnect the external wiring to the proper screw
          terminal.

7.5.9   Rotate switch screw S1, S2, and S3 (Fig. 1) fully clockwise (circuit closed).
          Install 89A's cover and at 117-volt AC outlet, connect 2012B transformer
          to outlet. At customer-provided equipment request the customer apply
          power to his equipment. END.

7.5.10   At customer-provided equipment, request the customer to apply power to his equipment. Also, do the following in order:

1. At PBX Cabinet remove LC17B from its slot in the carrier (see step 7.10).

2. At 89A Control unit; reconnect leads to PG1, and PG2 screw terminals, and install the 89A's cover.

3. At PBX Cabinet install new LC17B in its slot in the carrier (see step 7.10).

Make Code Calling test call. If the chimes were heard; this will end the correction. Otherwise, at PBX Cabinet install the original LC17B in its proper slot (see step 7.10). Assume trouble in software (see step 7.11), or wiring (refer to SD-1E480-01). END.

7.5.11   At 89A Control Unit; disconnect handset. Using DMM, measure AC voltage between AC1 and AC2 screw terminals. If DMM measures from 15 to 18 volts AC, go to 7.5.12. Otherwise, at the 117-volt AC outlet, replace 2012B transformer. END.

7.5.12   Do the following in sequence:

1. At 117-volt AC outlet; disconnect 2012B transformer.

2. At 89A Control Unit; disconnect and tag external wiring, and replace 89A Control Unit.

3. Connect external wiring to the new 89A Control Unit.

4. Rotate switch screws S1, S2, and S3 (Fig. 1) fully clockwise.

5. At 117-volt AC outlet; connect 2012B transformer to outlet.

6. Install the 89A Control Unit's cover.

7. END.

7.6.1   At 89A Control Unit; remove the cover. At handset set the switch to MON, and connect it to CT and CR screw terminals on 89A.

7.6.2   Monitor signal while making Code Calling test call. If the proper chime tone is heard, then assume that trouble is in customer-provided equipment. END. Otherwise go to 7.6.3.

7.6.3   Disconnect handset from 89A. Remove 89A's cover and connect handset
         to CT and CR screw terminal. At handset, monitor signal while making
         Code Calling test call. If proper chime tone is heard go to 7.6.4. Otherwise,
         go to 7.6.5.

7.6.4   Disconnect handset from 89A unit. At customer-provided equipment,
         request the customer to remove power from equipment, and then follow paragraphs
         7.5.8 and 7.5.9.

7.6.5   At PBX Cabinet replace LC17B from its slot (see step 7.10). Monitor
         signal while making Code Calling test call. If proper chime tone was
         heard; it ends the correction. Otherwise, at PBX Cabinet replace LC17B
         and assume trouble is in wiring (SD-1E480-01). END.

7.7.1   At PBX Cabinet replace LC17B in its slot in the Carrier (see step 7.10), and
         make Code Calling test call. If the customer-provided equipment turned
         off after chime cycles are completed, then the correction is done. Otherwise,
         go to 7.7.2.

7.7.2   Do the following in sequence:

         1. At PBX Cabinet install the original LC17B back in its slot (see step 7.10).

         2. At customer-provided equipment; request customer remove power
            from equipment.

         3. Remove 89A's cover, and disconnect leads from CBS1 and CBS2.
            Screw terminals.

         Using DMM, measure resistance between CBS1 and CBS2 screw terminals.
         If the resistance measured is not less than 30 OHMS, then, assume trouble
         is in customer provided equipment or wiring, and this ends the correction.
         Otherwise, remove 89A's cover and follow paragraphs 7.5.8 and 7.5.9.

7.7.3   Check PROC. NO. 350, WORD 2 to determine if correct answerback Dial
         Code has been assigned to Code Calling (enter encode 18 in field 1). If
         the data in PROC. NO. 350, WORD 2 is not correct, change answerback
         Dial Code. This will end the correction. Otherwise, go to 7.7.4.

7.7.4   Check PROC. NO. 350, WORD 1, to determine if first digit is correctly administered (enter the first digit in field 1). If the data in PROC. NO. 350, WORD 1 is not correct, change administration of first digit. This will end the correction. Otherwise, go to 7.7.5.

7.7.5   Reinitialize (see note in paragraph 7.2.5) the system; if this clears the trouble, this will end the correction procedure. Otherwise, assume trouble is in software (see step 7.11). END.

7.8.1   Do the following in order:

   1. At customer-provided equipment; request the customer to get BUSY/IDLE switch to BUSY.

   2. At 117-volt AC outlet; disconnect 2012B transformer from outlet, and remove its cover.

   3. Using DMM, measure resistance between COS1 and COS2.

   If the measured resistance is not approximately 0 OHMs, then at 117-volt AC outlet, connect 2012B to outlet. Assume trouble is in customer-provided equipment or wiring. This ends the correction. Otherwise go to 7.8.2.

7.8.2   At 117-volt AC outlet, connect 2012B transformer to outlet. Also, at PBX cabinet unseat LC17B from its slot (see step 7.10), and remove 89A's cover.

7.8.3   Using DMM, measure resistance between BSY1, and BSY2 screw terminals. If the resistance measured is not less than 30 OHMs go to 7.8.4. Otherwise go to 7.8.5.

7.8.4   At customer-provided equipment, request customer to remove power from his equipment. Also, at PBX Cabinet install LC17B in its slot in Carrier (see step 7.10), and follow paragraphs 7.5.8 and 7.5.9. END.

7.8.5   Install 89A's cover and at PBX Cabinet replace LC17B (see step 7.10).

7.8.6.   Make Code Calling test call. If the Code Calling circuit is busy, then at customer-provided equipment, request the customer to set BUSY/IDLE switch to IDLE. This ends the correction. Otherwise go to 7.8.7.

7.8.7   At PBX Cabinet install the original LC17B back in slot in Carrier (see step 7.10), and assume the trouble is in wiring between LC17B and 89A Control Unit (refer to section 250.23 in handbook 282 and SD-1E480-01). END.

7.9   Reinitialize the system (see note in paragraph 7.2.5). If this clears the
        trouble then this ends the correction procedure. Otherwise, assume the
        trouble is in software (see step 7.11). END.

7.10   To determine which module, cabinet, carrier, and slot the LC17B is in; PROC.
        255 (Fig. 2) should be used. Field one (EQUIP. TYPE) should be displaying either
        0 = NO CAS or 2 = CAS.

7.11   For troubleshooting in software, contact RTAC engineer.

Fig. 1 - 89A Control Unit, Mounted with Cover Removed

NOTE: Kit of parts D-180702 might become part of main circuit board, but the X, Y, Z options are still present.

INPUT FIELDS REQUIRED:	NOTES:	9.FIELD 1 CODES:	SPECIAL ERROR CODES:
DISPLAY: 1 OR 2 & 3 ADD: 1-3 REMOVE: 1-3 CHANGE: 1-3	1.REGULAR TONE PLANT MUST BE ASSIGNED TO SAME MOD/FRM/CAR; SEE PROC 252. 2.CAS FEATURE IS LOADED, EQUIPMENT TYPE MUST BE BOTH. 3.CODE CALLING FEATURE IS NOT LOADED, EQUIPMENT TYPE MUST BE CAS ONLY. 4.CAS FEATURE IS NOT LOADED, EQUIPMENT TYPE MUST BE CODE CALLING ONLY. 5.CODE CALLING EQUIPMENT IS ASSIGNED (ONLY ONE ALLOWED). 6.CODE CALLING EQUIPMENT IS NOT ASSIGNED. 7.CODE CALLING IS ACTIVE; MUST BE INACTIVE TO REMOVE EQUIPMENT. 8.CAS IS ACTIVE; MUST BE INACTIVE TO REMOVE LAST CAS EQUIPMENT.	0=USED TO ASSIGN EQUIPMENT FOR CODE CALLING USE WHEN CODE CALLING FEATURE ONLY IS LOADED. ONLY ONE ASSIGNMENT OF THIS TYPE ALLOWED. 1=USED TO ASSIGN EQUIPMENT FOR CAS USE ONLY WHEN CAS FEATURE IS LOADED. 2=USED TO ASSIGN EQPT FOR BOTH CAS AND CODE CALLING USE;WHEN BOTH FEATURES ARE LOADED. ONLY ONE ASSIGNMENT OF THIS TYPE ALLOWED.	81-SEE NOTE 1 82-SEE NOTE 2 83-SEE NOTE 3 84-SEE NOTE 4 85-SEE NOTE 5 86-SEE NOTE 6 87-SEE NOTE 7 88-SEE NOTE 8

ISSUE L8.3 FLIPCHART	PROC 255

FLIPCHART ISSUE L8.3	AUXILIARY TONE PLANT	PROC 255

EQUIP TYPE	EQUIPMENT LOCATION				
	MODULE	CAB.	DISP. ONLY		
			CARR.	SLOT	
1	2	3	4	5	

FIG. 2 – FLIPCHART FOR PROC. 255

Reason for issue:
New section

Manager, Denver PBX BECC