AT&T Standard
Plant Training Course

Job Aid
PTC No. 315
N1, N2, Carrier
ACKNOWLEDGMENTS

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 New England Bell Telephone Company
 AT&T Long Lines (Southern Area)
 New Jersey Bell Telephone Company
 Southwestern Bell Telephone Company

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Complete test and adjustment procedures may be found in the 362 Division of the Bell System Practice's.

JOE AID - N1 CXR
Test Points, Test Levels, Electron Tubes and Their Functions.

"COM" POT ADJ. TO +3dBm AT T.P. "F"

"REL CUT" POT, ADJ TO 15 VOLTS WHILE OBSERVING METER CONNECTED TO TP1 & 2 (DISTANT END MUST LIVE ON HOOK TOWARD YOU.)

"MOD" POT, ADJ T.P. "M2" TO READING RECORD ON FORM E4559

"BRK" POT ON TYPE "E" UNITS (ONLY).

"BRK" POT ADJ BIAS OF V41. DISTANT END SENDS 12PPS @ 58% BREAK MEASURING PULSES WITH 2B SIG TST SET ADJ POT UNTIL TST SET READS 62% BREAK. INITIAL READING SHOULD BE BETWEEN 56 & 64

TP1 (POSITIVE LEAD) SHOULD READ 14-16 VOLTS

TP2 (NEGATIVE LEAD)

"SIG" POT - CONTROLS THE GAIN OF THE SIGNAL TONE AMPLIFIER (SEE NOTE 1)

"EXP" POT ADJ "E1-E2" TO +0.0dbm

TP3 - ENABLES SHUNTING DOWN THE OUTPUT LEVEL OF FILTER (3700 Hz) AS REQ IN CERTAIN LINE-UP TESTS. NO MEASUREMENTS ARE MADE FROM THIS POINT. TP3 IS A BARE PIECE OF WIRE.

"RED" POT ADJ "R1" TO READ -33dbm

NOTE 1:
CHANNEL UNIT IN TEST STAND, HAVE DISTANT END PUT AN "ON" HOOK TOWARD LINE (N LEAD). THEN STRAP S1 TO TP3 AT TESTING END. A 2B SIG TST SET REQUIRED AT BOTH ENDS.
M LEAD - OFF HOOK = -48V
M LEAD - ON HOOK = GND
E LEAD - OFF HOOK = GND
E LEAD - ON HOOK = OPEN

INTERNAL SIGNALING AMPLIFIER
 OUTPUT LEVEL OF 3700 Hz
 FILTER = SIGNAL TONE FROM
 DISTANT END (-3.4 to +4.6dBm)

"REC" POT ADJ FOR +7dB AT
 THE 6 WIRE BOARD - OVERALL
 FINAL ADJ AFTER LINE-UP
 (TONE FROM DISTANT END IS
 REQUIRED FOR THIS ADJ.)

INPUT TO THE COMPRESSOR
 I.E. TRANSMITTING (-16dBm)

OUTPUT OF THE EXPANDOR
 I.E. RECEIVING (+10dBm)
 TONE MUST BE APPLIED AT
 DISTANT END FOR THIS
 MEASUREMENT

"REC" POT ADJ FOR +7dB AT
 THE 6 WIRE BOARD - OVERALL
 FINAL ADJ AFTER LINE-UP
 (TONE FROM DISTANT END IS
 REQUIRED FOR THIS ADJ.)

"REC" POT ADJ FOR +7dB AT
 THE 6 WIRE BOARD - OVERALL
 FINAL ADJ AFTER LINE-UP
 (TONE FROM DISTANT END IS
 REQUIRED FOR THIS ADJ.)

V41 SIGNALING AMPLIFIER
 OUTPUT LEVEL OF 3700 Hz
 FILTER = SIGNAL TONE FROM
 DISTANT END (-3.4 to +4.6dBm)

V45 DC AMP (SIG.)

V42 CATHOD FOLLOWER (SIG.)

EXPANDOR SIGNALING
 SUBASSEMBLY

V101 OSCILLATOR (EFFECTS
 LEVEL AT M2)

TOTAL CXR AND SIDEBAND OUT-
PUT LEVEL OF CHANNEL. (LEVEL
HERE RECORDED ON FORM E4559
DURING INITIAL LINE-UP -
CAN BE MADE WITH OR WITHOUT
TONE ON THE CHANNEL.)

(1) N1 CARRIER CHANNEL

TEST POINTS AND TEST LEVELS ELECTRON TUBES AND THEIR FUNCTION
<table>
<thead>
<tr>
<th>TEST</th>
<th>PURPOSE OF TEST</th>
<th>TEST STAND REQ</th>
<th>MEAS. EQUIP. REQUIRED</th>
<th>MEASURE TEST POINT TO GRID, OR BETWEEN TEST POINTS</th>
<th>MEASURE TEST POINT TO GRID, OR BETWEEN TEST POINTS</th>
<th>REQUIRED VALUE</th>
<th>ADJUST</th>
<th>TEST CONDITIONS AND REMARKS</th>
<th>SECTION REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Channel Carrier Output</td>
<td>No</td>
<td>400C or D</td>
<td>—</td>
<td>M2</td>
<td>Recorded Value +0.6 db</td>
<td>Recorded Value</td>
<td>MOD</td>
<td>FA unit maintenance only. For F units and initial line-up see 362-625-502</td>
</tr>
<tr>
<td>2</td>
<td>Channel Carrier Leak</td>
<td>No</td>
<td>400C or D, 2B Sig. Set</td>
<td>—</td>
<td>M2</td>
<td>At least 18 db below TEST 1</td>
<td>—</td>
<td>FA Units or Ground TPG OFF HOOK on M lead</td>
<td>362-625-502</td>
</tr>
<tr>
<td>3 a</td>
<td>Compressor Gain</td>
<td>No</td>
<td>400C or D</td>
<td>—</td>
<td>F</td>
<td>At least +8.5 db</td>
<td>—</td>
<td>—</td>
<td>Send 1000 - at VF IN -16 dbm (4W), 0 dbm (2W).</td>
</tr>
<tr>
<td>3 b</td>
<td>Compressor Noise</td>
<td>No</td>
<td>400C or D</td>
<td>—</td>
<td>F</td>
<td>Max. -19.0 db</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Received Channel Carrier</td>
<td>No</td>
<td>400C or D</td>
<td>—</td>
<td>R1</td>
<td>-13.0 to -29.0 db</td>
<td>—</td>
<td>—</td>
<td>REG pot. set for maximum reading.</td>
</tr>
<tr>
<td>5</td>
<td>Demodulator Output</td>
<td>Yes</td>
<td>400C or D</td>
<td>—</td>
<td>Term. 6 of FL42 (168)</td>
<td>+11.0 to +14.0 db</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Expander Output</td>
<td>No</td>
<td>400C or D, 1000 - Tone 2B Sig. Set</td>
<td>—</td>
<td>E1-E2</td>
<td>+8.5 to +11.5 dbm</td>
<td>+10.0 db</td>
<td>EXP</td>
<td>Testing End: For line-up turn REG max cw, 600-ohm termination in MOD IN (2W), DEMOD OUT (4W)</td>
</tr>
<tr>
<td>7 a</td>
<td>Channel Regulation</td>
<td>Yes</td>
<td>400C or D, 1000 - Tone 2B Sig. Set</td>
<td>—</td>
<td>R1</td>
<td>—</td>
<td>-41.0 db</td>
<td>REG</td>
<td></td>
</tr>
<tr>
<td>7 b</td>
<td>Channel Regulation</td>
<td>—</td>
<td>2B Sig. Set</td>
<td>—</td>
<td>E1-E2</td>
<td>+9.0 to +10.5 db</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>7 c</td>
<td>Channel Regulation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>R1</td>
<td>—</td>
<td>-33.0 db</td>
<td>REG</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Channel Noise</td>
<td>No</td>
<td>5A Noise Set, 2B Sig. Set</td>
<td>MOD IN (2W) DEMOD OUT (4W)</td>
<td>See Section 362-626-510</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Channel Net Loss</td>
<td>No</td>
<td>Transmission, Meas. Set, 1000 - Tone 2B Sig. Set</td>
<td>MOD IN (2W) DEMOD OUT (4W)</td>
<td>#2 Wire Design Value</td>
<td>REC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Received Signal Level</td>
<td>Yes</td>
<td>400C or D, 2B Sig. Set</td>
<td>SI</td>
<td>-3.4 to +14.6 db</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Sig. Relay Current</td>
<td>Yes</td>
<td>Volt-ohm meter, 2B Sig. Set</td>
<td>TP1 to TP2 (+ to TP1)</td>
<td>14.0 to 16.0 Volts</td>
<td>15.0 V</td>
<td>REL CUR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Sig. Receiver Sensitivity</td>
<td>Yes</td>
<td>2B Sig. Set</td>
<td>2B Sig. Set</td>
<td>Eq. Jack of Test Stand</td>
<td>SIG, RELAY (K41) just operates as indicated by lamp on 2B Sig. Set</td>
<td>SIG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Per Cent Break</td>
<td>No</td>
<td>2B Sig. Set</td>
<td>2B Sig. Set</td>
<td>SIG L Jack of Patch Bay, or Eq. Jack of Test Stand</td>
<td>60 to 64%</td>
<td>62%</td>
<td>BRK</td>
<td>Distinct End: Adjust 2B Sig. Test Set to send 12 PPS at 080° break.</td>
</tr>
<tr>
<td>14</td>
<td>Min. Length of Pulse</td>
<td>No</td>
<td>2B Sig. Set</td>
<td>2B Sig. Set</td>
<td>SIG L Jack of Patch Bay, or Eq. Jack of Test Stand</td>
<td>Minimum 12%</td>
<td>—</td>
<td>—</td>
<td>Distinct End: Send 12 PPS and adjust ADJ % BRK on 2B Sig. Set slowly from extreme counterclockwise until a deflection just appears on 2B Sig. Set at testing end. Read % break at distant end.</td>
</tr>
</tbody>
</table>
If receiving level trouble:

1. Check level at "RI" jack and adjust "REG" pot for -33dBm.

   - If level OK:
     - Check level at "E1-E2" jack and adjust "EXP" pot for +10dBm.
     - If level OK:
       - Replace subassembly or check for wiring trouble.
     - If level bad:
       - Advise distant end.
   - If level bad:
     - Check with Sierra at J 13 or J 14.

2. If level bad:
   - Check level at 6 wire BD and adjust "PEC" pot for +7 if necessary.

3. If level OK:
   - Adjust to proper level.

4. Restore to service.
OPEN SYSTEM

RESTORE SERVICE BY PATCHING TO SPARE CHANNELS

OPEN TOWARD YOU

SELECT CHANNEL SIERRA SELECTOR OR GR IN
MEASURE AT J3 OR J4

LEVEL BAD

HAVE 1ST ATTENDED STATION CHECK

LEVEL GOOD AT GR IN

BAD GROUP RECEIVE UNIT

LEVEL GOOD TO 1ST STATION

TROUBLE BETWEEN 1ST STATION AND YOU

NOTIFY PROPER MAINTENANCE CENTER

LEVEL BAD TO 1ST STATION

TROUBLE BETWEEN 1ST STATION AND DISTANT END

NOTIFY PROPER MAINTENANCE CENTER

OPEN TO DISTANT END

CHECK LEVEL TRANSMITTING WITH 2J OR SIERRA AT J1 OR J2

LEVEL GOOD

HAVE 1ST ATTENDED STATION CHECK

LEVEL GOOD TO 1ST STATION

TROUBLE LOCATES BETWEEN 1ST STATION AND DISTANT END

NOTIFY PROPER MAINTENANCE CENTER

LEVEL BAD

REPLACE GROUP TRANSMIT UNIT

LEVEL BAD TO 1ST STATION

TROUBLE LOCATES BETWEEN YOU AND 1ST STATION

NOTIFY PROPER MAINTENANCE CENTER
OFFICE ALARM

DETERMINE TYPE OF ALARM

CARRIER ALARM

STATION ALARM

3700M ALARM

FUSE ALARM

RESET ALARM

SILENCE ALARM RESTORE CIRCUITS BY PATCHING TO SPARE CHANNELS

LEVEL BAD UNABLE TO ADJUST TO +3.86B WITH R4

LEVEL GOOD

FUSE O.K.

FUSE WILL NOT HOLD (BLOWS AGAIN)

REPLACE V41 TUBE IN OSCILLATOR SUBASSEMBLY

REPLACE OSCILLATOR SUBASSEMBLY

LEVEL BAD

LEVEL GOOD

REPAIR OR REPLACE DEFECTIVE EQUIPMENT

MAKE TICKET OR STROKE RECORD

LOCATE DEFECTIVE EQUIPMENT

RESTORE ALL CIRCUITS NORMAL WHEN TROUBLE CLEARED

REFERENCE

BSP 362-010-150 Order Wire and Alarm Facilities
362-010-501
362-020-503 Check of Alarm Operation

BSP TEST EQUIPMENT REFERENCE
(Specific to N1 & N2 CXR)

N CARRIER SYSTEM TEST SETS

103-467-100 J98705M (5M) Channel Unit Test Stand
103-468-100 Carrier Failure Indicator
103-471-100 J94002N (2N) Group Unit Switching Set
103-472-100 J94002M (2M) Switching Set for N1 or ON Repeaters and N2 Repeaters with N2/N1 Adapters
103-473-100 J98703BD (3BD) Switching Set for N1A Repeaters and N2 Repeaters in N2/N1A Adapters.
103-474-100 J94002J (2J) Repeater Test Set
103-475-100 J94002K (2K) Tube Test Set
103-476-100 J94002P (2P) Tube Test Set
103-477-100 J98703AF (3AF) Deviation Regulator Test Set

N LINE TEST SETS

103-478-100 KS 19750 Deviation Test Set
103-478-101 Sierra Model 322A Carrier Generator

N2 SWITCHING SETS

103-480-100 & 500 J99272U Switching Set
103-480-101 & 501 J99321S Switching Set
103-481-100 & 500 J99272W Test Stand
103-481-101 & 501 J99272AH Test Stand

NOISE MEASURING SETS

103-500-100 J94007A (7A) Range 10 to 552 KHz
103-500-101 N Line Noise Sectionalization Set

Fig. 2 - N1 Carrier Frequency Allocation and Repeater Group Modulation
CHANNEL TRANS LEVEL TBL

CHANNEL OUT OF SVC TONE ON AT VFLB -16db MOD IN

CHECK LEVEL AT C1-C2 -16db

LEVEL GOOD

CHECK LEVEL AT "MI-MG" MG GROUND 16.3 to 17.3

LEVEL GOOD

CHECK LEVEL AT "MO-MG" MG GROUND -28db

LEVEL BAD

REPLACE COMPANDOR & RECHECK

LEVEL BAD

REPLACE MODEM AND RECHECK

LEVEL GOOD

CHECK LEVEL WITH SIERRA AT J1 FOR PARTICULAR CHANNEL FREQ

LEVEL BAD

TBL IN LTU, GROUP TRANS OR WIRING

LEVEL GOOD

GOOD TRANS LEVEL.
CHANNEL RECEIVE LEVEL TROUBLE

CHANNEL OUT OF SVC. HAVE DISTANT END PUT TONE ON CHANNEL -16db

CHECK LEVEL AT VFLB FOR +7db

LEVEL GOOD +7db
- RECEIVE LEVEL OK
- RESTORE TO SERVICE

LEVEL BAD ADJUST "OUTADJ" POT FOR +7db
- ADJUSTED "OUTADJ" POT TO +7db
- RECEIVE LEVEL OK
- RESTORE TO SERVICE

UNABLE TO ADJUST TO +7db

CHECK LEVEL AT "DO-DG" DG GROUND -3 TO -22db

LEVEL BAD ADJUST "OUTADJ" POT FOR +7db
- ADJUSTED "OUTADJ" POT TO +7db
- RECEIVE LEVEL OK
- RESTORE TO SERVICE

LEVEL GOOD
- CHECK LEVEL AT "DO-DG" DG GROUND -4 TO -6db

LEVEL BAD
- CHECK LEVEL AT CABLE TERM WITH SIERRA

LEVEL GOOD
- REPLACE MODEM AND RECHECK

LEVEL BAD
- BAD GROUP REC. OR WIRING TROUBLE

LEVEL GOOD
- ADJ "OUTADJ" POT FOR +7db AT VFLB

LEVEL BAD
- TROUBLE LOCATES ON LINE

UNABLE TO ADJUST TO +7db
- REPLACE COMPAENDOR & RECHECK

LEVEL GOOD
- CHECK LEVEL AT E1 TO E2 +6.8 TO +7.2db NO ADJ
- ADJ "OUTADJ" POT FOR +7db AT VFLB

LEVEL BAD
- RECEIVE LEVEL GOOD

RESTORE TO SVC.
N2 CARRIER

REFERENCE
B3P 362-603-100 thru 511 Alarm Units
362-210-100 N2, Group Alarm Unit
and Group Alarm Signal Receiver Unit
362-340-501 J99272AR Signal Receiver
362-345-100 Group Alarm and E-Signaling
### CHART 1

#### CARRIER-FREQUENCY MEASUREMENTS

<table>
<thead>
<tr>
<th>TESTS/UNITS</th>
<th>JACKS</th>
<th>METER</th>
<th>ADJUST</th>
<th>REQUIREMENT</th>
<th>NOTES</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitted Carrier Channel Modem Output</td>
<td>MO-MG</td>
<td>VTVM</td>
<td>—</td>
<td>−27.5 to −29.5 dB</td>
<td>HGT</td>
<td>362-806-501</td>
</tr>
<tr>
<td>Total Power Output Group Transmitter</td>
<td>J1</td>
<td></td>
<td>2J</td>
<td>+10.0 to +14.0 dBm</td>
<td>LGT Fully equipped systems only</td>
<td>362-805-501</td>
</tr>
<tr>
<td>Group Transmitter (slope, bulge, cubic, and quartic)</td>
<td>J1</td>
<td>DTS</td>
<td>—</td>
<td>Measured slope ±1.0 dB of design value.</td>
<td></td>
<td>362-805-502</td>
</tr>
<tr>
<td>Group Transmitter (individual power outputs)</td>
<td>J1</td>
<td>CFVM</td>
<td>—</td>
<td>±1.0 dB of computed slope.</td>
<td>Adjacent carriers no greater than 1.0-dB level difference.</td>
<td>362-805-502</td>
</tr>
<tr>
<td>Total Power Output Group Receiver</td>
<td>J3</td>
<td>VTVM</td>
<td>—</td>
<td>−10.5 to −15.5 dB</td>
<td></td>
<td>362-805-503</td>
</tr>
<tr>
<td>Group Receiver (slope, bulge, cubic, and quartic)</td>
<td>J3</td>
<td>DTS</td>
<td>Repeatered Line</td>
<td>Measured slope and bulge ±1.0 dB of design value.</td>
<td></td>
<td>362-805-504</td>
</tr>
<tr>
<td>Group Receiver (individual power outputs)</td>
<td>J3</td>
<td>CFVM</td>
<td>—</td>
<td>−1.5 dB of computed slope.</td>
<td>Adjacent channels no greater than 1.0-dB level difference.</td>
<td>362-805-504</td>
</tr>
<tr>
<td>Received Carrier Channel Modem Input</td>
<td>DI-DG</td>
<td>VTVM</td>
<td>—</td>
<td>−3.0 to −22.0 dB (LC Filter)</td>
<td>Adjacent channels no greater than 5.0-dB level difference.</td>
<td>362-806-501</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−8.5 to −27.5 dB (Crystal Filter)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 362-831-501**
### Chart 2

**Voice-Frequency Measurements**

(Read 1000~ at -16 dBm in VF IN or MOD IN)

<table>
<thead>
<tr>
<th>TEST</th>
<th>UNIT</th>
<th>JACKS</th>
<th>METER</th>
<th>REQUIREMENT</th>
<th>ADJUST</th>
<th>NOTES</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VF IN</strong></td>
<td>Compandor</td>
<td>C1, C2</td>
<td>VTVM</td>
<td>-15.8 to -16.5 dBm</td>
<td>-</td>
<td></td>
<td>362-800-505</td>
</tr>
<tr>
<td>Modem</td>
<td></td>
<td></td>
<td>VTVM</td>
<td>+16.3 to +17.3 dBm</td>
<td>-</td>
<td></td>
<td>362-806-502</td>
</tr>
<tr>
<td><strong>VF OUT</strong></td>
<td>Modem</td>
<td>DO, DG</td>
<td>VTVM</td>
<td>-4.0 to -6.0 dBm</td>
<td>-</td>
<td>May be higher because of office loss to patch bay</td>
<td>362-800-505</td>
</tr>
<tr>
<td><strong>VF OUT</strong></td>
<td>Compandor</td>
<td>E1, E2</td>
<td>VTVM</td>
<td>+6.8 to +7.2 dBm</td>
<td>-</td>
<td></td>
<td>362-800-505</td>
</tr>
<tr>
<td>VF Patch Bay</td>
<td>DEMOD OUT</td>
<td></td>
<td>TMS</td>
<td>+7.0 dBm</td>
<td>OUT ADJ</td>
<td></td>
<td>362-800-505</td>
</tr>
<tr>
<td><strong>VF OUT</strong></td>
<td>Compandor</td>
<td>E1, E2</td>
<td>VTVM</td>
<td>+6.8 to +7.2 dBm</td>
<td>OUT ADJ</td>
<td>Readjust to +7.0 dBm</td>
<td>362-800-505</td>
</tr>
<tr>
<td>No VF Jacks</td>
<td>Compandor</td>
<td>E1, E2</td>
<td>VTVM</td>
<td>+6.8 to +7.2 dBm</td>
<td>OUT ADJ</td>
<td></td>
<td>362-800-505</td>
</tr>
</tbody>
</table>

### Transistor Emitter Current Test

Measure the following voltages on both the group transmitting and the group receiving units and check that they fall within the specified limits. Use the 3-volt voltmeter scale whenever possible.

**Caution:** To assure that the bias voltages are not affected by over-driving the amplifier due to line noise or high signal level, do not make measurements on receiving group units unless carriers have been applied and the unit has regulated to the proper output power.

**Requirement:** The voltages shall be as follows:

<table>
<thead>
<tr>
<th><strong>Test Points</strong></th>
<th><strong>Transmitter</strong></th>
<th><strong>Receiver</strong></th>
<th><strong>Nominal Voltage</strong></th>
<th><strong>Voltage Limits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Points On Face of Group Equipment</strong></td>
<td><strong>Transmitter</strong></td>
<td><strong>Receiver</strong></td>
<td><strong>High Group</strong></td>
<td><strong>Low Group</strong></td>
</tr>
<tr>
<td>EM1 to -21V</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>EM3 to -21V</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>EM5 to -21V</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>EM6 to -21V</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOISY SYSTEM

RESTORE SERVICE BY PATCHING TO SPARE CHANNELS

SYSTEM NOISY TOWARD YOU

SYSTEM QUIET TOWARD YOU

HAVE SYSTEM LOOPED AT MIDPOINT OR ATTENDED STATION

INPUT LOOP

SYSTEM NOISY TOWARD YOU

SYSTEM QUIET TOWARD YOU

TROUBLE LOCATES BETWEEN YOU AND LOOP POINT OR AT LOOP POINT

NOTIFY PROPER MAINTENANCE CENTER

OUTPUT LOOP

SYSTEM NOISY TOWARD YOU

SYSTEM QUIET TOWARD YOU

TROUBLE LOCATES BETWEEN LOOP POINT AND OTHER OFFICE OR AT LOOP POINT

NOTIFY PROPER MAINTENANCE CENTER

SYSTEM QUIET TOWARD YOU

SYSTEM NOISY TOWARD YOU

TROUBLE LOCATES BETWEEN LOOP POINT AND OTHER OFFICE

NOTIFY PROPER MAINTENANCE CENTER

SYSTEM QUIET TOWARD YOU

SYSTEM NOISY TOWARD YOU

TROUBLE LOCATES BETWEEN YOU AND LOOP POINT

NOTIFY PROPER MAINTENANCE CENTER

SYSTEM QUIET TOWARD YOU

SYSTEM NOISY TOWARD YOU

TROUBLE LOCATES BETWEEN LOOP POINT AND OTHER OFFICE

NOTIFY PROPER MAINTENANCE CENTER

SYSTEM QUIET TOWARD YOU

SYSTEM NOISY TOWARD YOU

TROUBLE LOCATES BETWEEN YOU AND LOOP POINT OR AT LOOP POINT

NOTIFY PROPER MAINTENANCE CENTER
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1. COVER
2. ACKNOWLEDGEMENTS
3. N1 CXR, INTERNAL POT ADJUSTMENTS
4. N1 CXR, TEST POINTS / TEST LEVELS
5. BLOCK DIAGRAM, N1 CHANNEL UNIT
6. N1 CXR, LINE UP & MAINTENANCE TESTS
7. FLOW CHART - TRANSMITTING LEVEL TROUBLE
8. FLOW CHART - RECEIVING LEVEL TROUBLE
9. N1 CXR, SIGNALING TROUBLE
10. N1 CXR, OPEN SYSTEM - FLOW CHART
11. N1 CXR, OFFICE ALARM - FLOW CHART
12. BSP REF (TEST EQ) & N CXR FREQ ALLOCATIONS
13. N2 CXR, TRANSMITTING LEVEL TROUBLE
14. N2 CXR, RECEIVING LEVEL TROUBLE
15. N2 CXR, OFFICE ALARM - FLOW CHART
16. CARRIER - FREQUENCY MEASUREMENTS
17. VOICE - FREQ. MEAS. & EMITTER CURRENT TEST
18. NOISY SYSTEM, N1 OR N2

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NOTE: FLOW CHART 18 MAY ALSO BE USED TO
SECTIONALIZE AN N2 OPEN SYSTEM TROUBLE
No job is so important and no service is so urgent that we cannot take time to perform our work safely.

Bell System