GENERAL

This manual covers all Line Logg-Rs equipped with software Version 1.41 or higher.

In order to provide our customers with the best possible performance features, RAN Systems is constantly enhancing the software used in the Model LMT-4911. Thus, it is impractical to list all the capabilities of your version of software in this manual.

To obtain the capabilities of the particular version of software with which your unit is equipped, enter:

DVER

Technical Specifications for the Line Logg-R are delineated in APPENDIX N.

LOGGING ON

Model 4911 is equipped with security, in the form of passwords that are required for logging on to either port. To discourage hackers, Model 4911 does not ask for the password, so the user must know the correct command (verb and modifier) to log on. After the unit has been turned on, and time has been allowed for it to boot, a power-up message will be displayed, followed by a prompt =>. If the message and/or the prompt is not displayed or is garbled, the terminal connected to the port is probably set incorrectly. Make certain that the settings are 1200 baud, 8 data bits, no parity, 1 stop bit, full duplex, and then reboot the Line Logg-R. Once the correct prompt is displayed, first time users can log on by entering:

SLOG 1

The Line Logg-R will reply: PASSWORD? Enter SUPERUSER and hit return. A welcome message should then be received and the unit is now fully operational. We strongly recommend that APPENDIX L be fully read before proceeding.

1 ABOUT THE LINE LOGG-R

The Line Logg-R monitors and tests from 1 to 80 two-wire lines, recording all the events that occur on the lines and time stamping them to the nearest 10 milliseconds. Complete reports are then available, categorized by event, statistic or summary.

The Line Logg-R stores up to two month’s of monitored call data and 2 years of pre-processed call data which can be electronically archived, if so desired.

In addition to the monitored data, the Line Logg-R stores a name or number of up to 16 characters in length for each line. Any number of lines may be grouped together for reporting purposes in one or more groups, and each group may also be named. A line may be a member of more than one group, and there can be from one to sixteen groups.

The Line Logg-R is controlled via either of two RS-232 ports. Both ports are suitable for use with a local terminal or a modem. Security is provided for both ports by means of passwords.

Depending upon the size of the installation, the Line Logg-R consists of either one or two units, both of which are the same physical size. The Common Equipment Chassis holds from 1 to 5 monitor cards, for a maximum capacity of 40 lines. An Expansion Chassis which holds an additional 16 cards may be connected to the Line Logg-R to provide a maximum 80 line capacity in a single system.

The Line Logg-R records the following events, which it uses to create reports:

Incoming Ring:
  Ring Voltage start/termination

TIP-RING Supervision Status:

  Seized/idle states, normal and reversed battery
  Normal/reversed battery
  Open/grounded states, TIP and RING

MF Digits (option -04):

  Valid Digit received/terminated

DTMF Digits (Standard):

  Valid Digit received/terminated

CND (Caller Number Delivery/Caller ID) Digits (option -25)

  Valid Digit received/terminated

Wink, Flash and Transient Events

The Line Logg-R maintains an audit trail for stored and incoming data by time stamping all data files at 10 minute intervals, and by recording both the time and the status of all lines each time it is powered-up or booted.

Additionally, the Line Logg-R can be equipped with a TMS card (option -03) which contains two VF test sets, designated A and B. Test Set A is a full TMS, and is also equipped with a DC Voltmeter which reports T-Gnd, R-Gnd and T-R voltages. This set is used for manual testing of individual lines, which can be accomplished without interrupting the monitoring of any of the lines.

Four wire private line circuits, such as dedicated modem links, may be monitored and tested with the TMS Module by installing a VF Test/Monitor Card (option -08) instead of a Line Monitoring Card.

Test Set B is a monitor only level/noise meter used for continuous monitoring of live traffic for transmission parameter analysis.

2 GETTING STARTED

Before installing the Line Logg-R, unpack all components and check for damage. Next, check the system's serial number and configuration against the information in APPENDIX A of this manual. Be certain it agrees with your order.

2.1 Installation

The correct installation sequence for the Line Logg-R is:

- Plan the installation and configure the unit.
- Physical installation, power, local ground.
- Connect modems and/or terminals.
- Connect local printer (if used).
- Operate the Unit.
- Configure the Unit Data Base.
- Connect the lines to be monitored.
- Test all lines for correct connection.
- Start monitoring with STRT command.

2.1.1 Plan The Installation and Configure the Hardware

Make a plan: decide which lines will be connected to what inputs of the system and record on the charts provided in APPENDIX A. Keep the charts current when changes are made.

Configure the hardware: Check the settings (DIP switches, jumpers, slot locations, etc.) of all cards against the intended usage. Appendices B, C, D, E, F, G, J, K, R, S, T, X and W all address hardware configuration/optioning of various Line Logg-R elements. Refer to the *"Installation and Maintenance Manual"* for more details.

2.1.2 Physical Installation, Grounding and Power

Line Logg-R requires no special installation. You may have one or two units, depending on system size. Mount them in a bay or rack, using the adjustable mounting ears (supplied), or place them on a flat surface. Each unit comes equipped with rubber feet. If you are mounting them in a rack, remove the feet. If you have two units (Common Equipment Chassis and Expansion Chassis), mount the Common Equipment Chassis below the Expansion Chassis. The two must not be separated in the rack by more that 1/2”. If you are placing them on a shelf or table place the Expansion Chassis on top of the Common Equipment Chassis.

If two units are involved, interconnect them with the following cables:

Power Cable	9402B09
Signal Cable	9402B04
Control Cable	9402B03

The Power Cable has identical connectors on both ends, and can be inserted only into the matching receptacles on the rear panels of the two units. The same is true for the Signal Cable. The Control Cable is shipped with one end connected inside the Common Equipment Chassis. Connect the other end to the corresponding connector on the rear of the Expansion Chassis.

Ground the common unit to the local power ground or telephone ground with a #18 or larger stranded ground wire. Do not rely on the third pin ground provided by the power cord. If you have an Expansion Chassis, ground it to the Common Chassis. Make certain that the power switch (on the rear panel) is in the OFF position, then plug the supplied power cord into any standard 110VAC 60HZ power receptacle. UPS power is desirable, but not mandatory, as the Line Logg-R automatically transfers its data to disk once a minute to protect against loss.

2.1.3 Connecting the Control Terminal or Modem.

Line Logg-R is equipped with two control ports, designated COM1 and COM2. The two ports are identical in function and may be used with a terminal or modem. Both ports are DTE, and Line Logg-Rs are shipped with both ports set to 1200 baud, 8 data bits, no parity, 1 stop bit, full duplex. If you require a different setting use the SCOM command to change the settings. After you have changed the settings, reboot by powering down and the system will change to the new values. Port settings are stored on the system disk, and are automatically set to the selected values on power up.

2.1.3.1 Modem

Modems may be used with either or both ports. Connect the modem with a straight through RS-232 cable equipped with a DB-25 male connector at the Line Logg-R end. Select modems that are compatible with the baud rate. See APPENDIX H.

2.1.3.2 Terminal

Terminals may be used with either or both ports. Connect the terminal via a null modem cable. Set the terminal to match the selected port characteristics.

2.1.4 Connecting the Local Printer

If a local printer is to be used for reports, connect any standard parallel printer to the printer port on the rear of the Line Logg-R. Use a standard IBM printer cable. The Line Logg-R outputs all data to the printer as a series of ASCII characters, so any printer that can reproduce parallel ASCII is satisfactory.

2.1.5 Data Storage Media

The Line Logg-R is equipped with one 3½ inch high density 1.44 megabyte disk drive on the front panel and a minimum of a 120 MB hard disk. All data, the operating system, programs, overlays and configuration files are stored on the hard disk. The hard disk also stores the user configurable data base, such as line types, off hook threshold voltages, enabled and disabled lines, line names, group names, line numbers, etc.

The data gathered by call monitoring is recorded on the internal hard disk. The drive on the front panel is used to create archive disks and load software version upgrades. Stored data from the hard drive can be transferred, on command, to a floppy disk in the front drive, which can then be removed for archiving. The unit is typically operated without a disk in the front drive. A Line Logg-R should only be powered-up with a disk in the floppy disk drive during software version upgrade procedures. Refer to APPENDIX P for details on System configuration back-up/restoration procedures.

The front drive requires a DSHD (double sided, high density) disk IBM formatted at 1.44MB.

2.1.6 Operation and Data Base Configuration

2.1.6.1 Operation

A Line Logg-R, equipped with software Version 1.41 or higher accommodates up to two users, logged on simultaneously, on different COM ports. It processes user command requests on a first in, first out basis.

A Line Logg-R is configured and activated via the terminal(s). On power up (power switch on rear panel), the Line Logg-R's computer will boot and then display its name and version on the terminal(s). This will be followed by a System prompt: **=>**

Once the prompt appears, the unit will accept a user log on. The following are requirements to access the Line Logg-R system:

1. A user must have an assigned user number and password, and must log on via the SLOG command. For more information on passwords and log on, see APPENDIX L.

2. Any user can log on to any COM port, provided the port is idle. A COM port is idle when no user is logged on to that port.

3. On occasion, a user will receive the message “SYSTEM BUSY”. This indicates that the system is processing the other COM port’s request and will process your request momentarily. This typically occurs during the creation of large detailed call reports via the CRPT command.

Initially, only the Superuser (SU) and the System Manager (SM) user numbers are active. The SU password is ‘SUPERUSER’ and the SM password is ‘SYSTEM MANAGER’. Do not type the quotation marks in the password.

Log on to either COM Port as SU, and the unit will accept commands. Each command must be followed by <ENTER>. Commands consist of four letters, followed by one or more fields (the fields vary with the commands). Commands can be separated into two groups, set commands which begin with an ‘S’, and display commands which begin with a ‘D’. Each set command as a corresponding display command. Additionally, there are several create commands, which begin with a ‘C’, for creating output. These are used to create reports from the data stored on the hard disk. They are also used to create archive disks.

The command set is specifically defined in APPENDIX M.

2.1.6.2 Data Base Configuration

In order to correctly monitor, the Line Logg-R must know, for each line, the busy (off hook) threshold voltage and type of supervision. Additionally, the date and time must be correct, and the lines to be monitored must be enabled. Line Logg-Rs are shipped with all lines disabled, thresholds set to -45 volts, line types set to Loop Start, the time to Eastern Standard Time, and all groups, group names and line names blank. Additionally, COM ports 1&2 are set to 1200 baud, 8 data bits, no parity, full duplex. These settings can be changed as required.

All settings are saved on the hard disk, and are automatically restored to the previously set values on power-up. The clock in the Line Logg-R has battery back-up, and thus runs continuously. Once the unit has been programmed, it is not necessary to reset any values on power-up.

At this time, enter the correct date and time as well as all the line and group names, so that when scanning first begins all the data will be useful. Do not enable any lines at this time, as the lines have to be connected, checked for correct TIP-RING polarity, and threshold.

Postpone the checking of threshold values for the lines (and changing them if necessary) until the lines have been connected, then proceed in accordance with Section 2.1.8.2. of this document.

2.1.7 Connecting the Lines to be Monitored

Connection is made by bridging the Line Logg-R across the pairs at any convenient point in the facility. Usually, this will be a connector block such as a Type 66 block or a distribution frame.

2.1.7.1 Via 66 Type Connector Blocks

Sets of 25 pair 'Type 66' connector blocks with mating VF cables are shipped with each Line Logg-R. One block and cable set is shipped with the Common Equipment Chassis, and up to three sets are shipped with the Expansion Chassis. Each block and cable set connects 20 lines to the Line Logg-R. Mount the block on any convenient surface and connect it to one VF connector on the rear of the Line Logg-R. Bridge the first 20 pairs on the block across the lines to be monitored by connecting pairs from the block to any convenient block in your distribution system. Additionally, connect the last two terminals to the local telephone ground. The remaining three blocks (if supplied) are connected to the connectors on the expansion chassis, and bridged across lines 21-40, 41-60 and 61-80 per APPENDIX J. If Caller ID Line Cards are used, which have 8 rather than 4 line circuits per card, lines 1-40 may be connected to the Common Equipment Chassis with lines 41-80 connected to the Expansion Chassis.

2.1.7.2 Direct Connection

The Line Logg-R may also be connected directly across the lines to be monitored, although this method of connection is not recommended. Obtain a suitable cable equipped with a standard 25 pair male ribbon connector at the Line Logg-R end, and connect the lines per APPENDIX K.

2.1.8 Checking the Line Connections

2.1.8.1 Checking for TIP-RING Reversals

Once the lines are connected, check them for correct TIP-RING polarity. The DC voltmeter in the Line Logg-R's TMS card should be used, if your unit is so equipped. If it is not equipped with a TMS Card, use any good quality voltmeter connected across the TIP and RING outputs of the type 310 TEST ACCESS connector located on the rear panel of the Common Unit. We recommend this connection so that TIP-RING reversals can be seen on the voltmeter. Proceed as follows:

First, connect the TMS or voltmeter to the line to be checked by using the STST command. Next, read the TIP and RING voltages with the TMS by using the SMES DCV R command, or directly with the voltmeter. Wait for the line to go idle (on hook). When this happens, the TIP to Ground voltage should be very close to zero (typically 0 to -3 volts), and the RING to Ground voltage should be close to -48 volts. If they are reversed, correct your connection before starting the scan.

2.1.8.2 Setting the Hold Voltage Thresholds

Check and set the thresholds as follows for each line, except for lines terminating on Caller ID Line Cards. Caller ID Card terminated lines all have preset thresholds and therefore no such threshold level determination is needed.

First, note the RING lead idle (on hook) voltage. Next, when the line comes busy, note the busy (off hook) voltage of whichever lead is the most negative. For ground start and loop start lines this will be the RING lead. For other types of lines, such as DID and reverse signaling, this may be the TIP lead. These values are needed as a guide for setting the hold voltage threshold for the line.

Finally, using the SHLV command, set the hold voltage threshold for the line to a value midway between the idle voltage level and the busy voltage level, as previously observed with the DC voltmeter. For example, if the idle voltage is 49 volts and the busy voltage is 35 volts, the difference is (49-35) = 14 volts. Half this difference is 7 volts. The correct threshold setting is therefore (49-7) = 42 volts.

Repeat this procedure for each line until every line has been verified as correctly connected. Once the unit is running, the validity of the threshold settings for each line can be verified by making test calls and checking a multi-line detail report for the test call time period.

2.2 Remote Reset Module

This optional module (option -19) permits the Line Logg-R to be remotely "rebooted" via a call placed to a pre-designated administrative line connected to the Line Logg-R. This module does not plug into the units' mother board, but rather is jumpered to cross connect punch connectors on the motherboard and to the selected admin line on the telephone line input connector block. Refer to APPENDIX G for configuration and connection details. Record the telephone number assigned to this remote reset module on APPENDIX A.

2.3 Position Identification Feature

There are two methods of position identification used by the Line Logg-R system, Tone (option -17) and Contact (option -27) driven. Only one method can be implemented in an individual Line Logg-R system. Tone position identifiers are described in APPENDIX W and Contact position identifiers are explained in APPENDIX X of this manual.

2.4 Start Monitoring

To place the Line Logg-R into operation, enable all lines to be scanned with the SENL command. The Line Logg-R will immediately start scanning all enabled lines. If the power is on and the scanning was previously stopped with the STOP command, start the scan with the STRT command.

2.5 Using the Test Set

The test Set can be used while monitoring proceeds. It can be bridged across a line that is enabled for scanning, but if so, the send tone function should not be used (to avoid inadvertent disruption of traffic). To use the set, select a line for test with the STST command and then issue the appropriate tone or measure command. When finished, select line 0 with the STST command to disconnect the test set.

3 COMMAND SET/ERROR CODES

The command set consists of three basic types of commands: (S)et, (D)isplay, and (C)reate. Each type begins with the letters C, D or S and ends with a carriage return [CR]. APPENDIX M alphabetically lists all valid commands with their respective arguments and required action.

3.1 Error Messages

3.1.1 Command Input Errors

COMMAND ERROR: Syntax.
COMMAND ERROR: Not implemented.
COMMAND ERROR: Invalid command.
COMMAND ERROR: Invalid parameter.
COMMAND ERROR: Parameter not supported.
COMMAND ERROR: No files for date requested.
COMMAND ERROR: Invalid operation requested.
COMMAND ERROR: Maximum character input limit exceeded.
COMMAND ERROR: Unknown line type, report not implemented.

3.1.2 General Disk Errors

DISK ERROR: No Disk.
DISK ERROR: Can not access disk.
DISK ERROR: Can not read file sizes.
DISK ERROR: DOS copy command failed.
DISK ERROR: Can not open file <......>.
DISK ERROR: Can not access system disk.
DISK ERROR: Write fail to file <......>.
DISK ERROR: Can not open file VERSION.TXT.
DISK ERROR: Can not save the POWERUP file.
DISK ERROR: System disk required in drive A.
DISK ERROR: Can not open data disk directory.
DISK ERROR: Data Path not set to hard disk drive C.
DISK ERROR: Can not run DOS commands from system disk.

3.1.3 Specific Disk Errors (followed by messages)

DISK ERROR: Error accessing disk drive A-- [message]
DISK ERROR: Error accessing System disk drive C-- [message]
DISK ERROR: Error accessing Data disk drive D-- [message]
DISK ERROR: Error accessing an unknown disk drive-- [message]
Messages:

- unknown command.
- unknown disk drive.
- bad request structure.
- disk error.
- write protected disk.
  Cannot write to a disk containing a write protect tab.
- disk drive not ready.
  Place a disk in the drive and close the disk drive latch.
- CRC data error.
  Back up disk immediately.
- seek error.
  Back up disk immediately.

---unknown medium error

Verify the disk is formatted for DOS.

- sector not found error.
  Back up disk immediately.
- write fault.
  Error writing to disk, check available free space.
- read fault.
  Error reading disk, Back up disk immediately.
- general failure.
  Verify the disk is formatted.

3.1.4 Other Errors

MEMORY ERROR: Memory allocation failure.

COMM ERROR: Can not communicate with printer.

TMS ERROR: Frequency port not ready.

TMS ERROR: Level or frequency out of range.

4 OUTPUT REPORTS

4.1 Manual and Automatic Reporting

Reports may be generated manually at any time by invoking the Create Report (CRPT) command. They may also be generated automatically by invoking the Set Automatic Report Generation (SARG) command per APPENDIX Q. Manual reports may be generated regardless of whether Automatic Reporting is enabled or disabled.

4.2 Report Intervals

Reports can be requested for any interval from 1 to 24 hours, in increments of 1 hour. Any time interval, past, present or future, can be requested.

4.3 Types of Reports

Reports can be created for all lines, or for a specific group of lines. Up to 16 groups can be defined, each containing up to 80 lines. A line may be included in more than one group. The following types of reports are available:

REPORT #	TYPE	COMMENTS
1	Traffic Summary	Reports the total traffic on each circuit. This can be DATA, VOICE, GROUP(s) or ALL. For DATA and VOICE, requires VOICE GROUP and DATA GROUP be specified in the data base. Traffic density is reported in Hundred Call Seconds (CCS). One CCS is 100 seconds of call activity (36 CCS = 1 hour).
2	Average Call Duration	Reports average call duration for each circuit in the GROUP or GROUPs specified, or ALL circuits.
3	Chronological Detail	Reports number of rings, call length, DTMF and/or MF digits for each call. Also, reports originate incoming/outgoing for Loop Start & DID lines, disconnect incoming/outgoing for DID lines.

REPORT #	TYPE	COMMENTS
4	Maintenance Detail	Same as Report 3 except report presented on a per line format
5	Multi Line Detail	Same as Report 4 except does not report call failures.
6	Peg Count	Reports the number of calls originated and answered hour by hour.
7	Busy Hour	Reports traffic for the busiest hour in the requested interval. Busy hour begins at 15 min intervals. An hour is defined as any 60 minute period commencing on any 15 minute boundary. Three listings are given: ALL, INCOMING and OUTGOING.
8	Transmission Parameters (Future Release)	Reports transmission parameters averaged over the last 48 hour period for VOICE, DATA, or ALL circuits. Out of specification parameters are flagged with '*'. Requires VOICE GROUP and DATA GROUP be specified in the data base.

4.4 Report Format

4.4.1 Traffic Summary (01)

SITE NAME

TRAFFIC SUMMARY: CCS for 24 hours ending 0700, March 28, 1994
GROUP(S): Ohio 694, Ohio 293

CCS From 1900 Hours to 0600 Hours

LINE	6	5	4	3	2	1	0	23	22	21	20	19
2 694-2234	4	7	4	2	1	1	0	0	1	1	1	0
9 694-8822	6	0	0	0	1	2	0	1	0	2	0	1
13 694-8823	5	5	3	1	0	0	1	1	0	o	2	0
14 694-8834	0	0	0	0	0	0	0	0	0	0	0	0
20 694-8835	4	6	1	1	1	1	1	0	0	0	2	1
3 293-1141	3	5	2	0	0	1	2	0	1	1	0	0
4 293-1142	4	2	0	1	1	0	1	0	0	0	1	1
18 293-1143	2	5	1	0	1	1	0	0	0	0	0	2
19 293-1145	2	3	0	0	0	1	0	0	1	1	0	2

CCS From 0700 Hours to 1800 Hours

LINE	18	17	16	15	14	13	12	11	10	9	8	7
2 694-2234	4	7	4	2	6	1	1	2	0	1	0	0
9 694-8822	6	0	3	1	4	2	0	3	1	0	0	1
13 694-8823	5	5	4	1	5	3	1	0	0	1	0	0
14 694-8834	0	0	0	0	0	0	3	1	1	0	1	0
20 694-8835	4	6	6	3	4	1	1	2	0	1	0	0
3 293-1141	3	5	2	2	3	1	4	1	1	0	1	0
4 293-1142	4	2	2	4	4	2	1	1	0	3	0	0
18 293-1143	2	5	3	1	3	1	2	2	0	1	1	1
19 293-1145	2	3	5	0	6	4	1	0	4	2	0	0

REPORT STATUS: REPORT SUCESSFULLY COMPLETED

4.4.2 Average Call Duration (02)

SITE NAME

AVERAGE CALL DURATION IN MINUTES

Averaged over the 24 hours ending 0700 March 28, 1994

GROUP(S): Ohio 694, Ohio 293

LINE	INCOMING AVERAGE MINUTES	INCOMING TOTAL CALLS	OUTGOING AVERAGE MINUTES	OUTGOING TOTAL CALLS
2 694-2234	2.6	71	4.3	85
9 694-8822	1.5	12	1.0	16
13 694-8823	3.3	111	2.5	126
14 694-8834	0.0	0	0.0	0
20 694-8835	2.0	22	3.6	64
3 293-1141	9.7	2	0.0	0
4 293-1142	4.2	81	2.4	97
18 293-1143	2.1	127	5.9	110
19 293-1145	2.7	66	3.3	126

REPORT STATUS: REPORT SUCCESSFULLY COMPLETED

4.4.3 Chronological Detail (03)

CHRONOLOGICAL DETAIL CALL REPORT
Measured over the 24 hours ending 0000 Hours
START DATE: 12-27-1994, END DATE: 12-28-1994
LINE/GROUP: G1
TOTAL CALLS: 173

START TIME	LINE TYPE NUMBER	C'NECT TIME RINGS	CALL LENGTH	DISC	POS NUM	ANI DIGITS CALLER ID	DTMF DIGITS
13:04:11	DID002	00:10	00:01:22	STN	001	<KP 24933170 ST	>
04:31							F<6781123>
13:12:03	DID001	01:10	00:12:05	CO	002	<No Digits	> <No Digits>
13:20:41	DID004	00:15	00:03:22	STN	003	<KP 24930000 ST	>
21:20							F<443135>
13:21:40	CID008	3	00:02:02	STN	006	<5614221100	>
22:15							F<4432278>

4.4.4 Maintenance Detail (04)

MAINTENANCE DETAIL CALL REPORT
Measured over the 24 hours ending 0000 Hours
START DATE: 12-27-1994, END DATE: 12-28-1994
LINE/GROUP: G1
TOTAL CALLS: 173

START TIME	DISC	C'NECT TIME	CALL LENGTH	ANI DIGITS	DTMF DIGITS
13:04:11	CO	00:30	01:22	<KP 2493317 ST	>
05:15					F<6781123>
13:12:03	CO	ABNA		<No Digits	> <No Digits>
13:20:41	STN	00:45	03:22	<No Digits	>
21:45					F<443135>
13:21:40	CO	01:04	02:02	<KP 4221100 ST	>
22:55					F<4432278>
23:10					F<>
23:45					F<4432289>
13:49:31	CO	01:35	10:29	<KP 4221100 ST	> <No Digits>
14:10:02	CO	ABNA		<No Digits	> <No Digits>
14:33:42	CO	01:1	03:14	<No Digits	> <No Digits>
15:39:13	CO	PAD		<No Digits	> <No Digits>
23:37:11	STN	01:03	09:22	<No Digits	>
39:21					F<2249877>
00:22:02	CO	01:04	11:59	<KP 2493317 ST	>
23:59					F<6783419>
00:41:29	CO	01:22	07:33	<No Digits	>
43:12					F<6783477>
03:35:00	CO	00:24	03:31	<No Digits	> F<6781123>

4.4.5 Multiple Line Detail (05)

Multi Line Detail reports are essentially a series of Maintenance Detail reports printed sequentially. Due to their length, they are not illustrated here. Refer to Maintenance Detail reports for format.

4.4.6 Peg Count (06)

PEG COUNT REPORT
Measured over the 24 hours ending at 0000 Hours
START DATE: 12-02-1994 END DATE: 12-03-1994
LINE/GROUP(S): Ohio 694

TOTAL CALLS: 116

		PEG for 1200 to 2300 Hours											
LINE		23	22	21	20	19	18	17	16	15	14	13	12
2	IN	1	3	1	2	1	1	0	0	1	1	1	0
	OUT	2	0	0	0	1	2	0	1	0	2	0	1
13	IN	2	1	3	1	0	0	1	1	0	1	2	0
	OUT	1	2	1	1	1	1	1	0	0	0	2	1
3	IN	3	1	2	0	0	1	2	0	1	1	0	0
	OUT	2	2	0	1	1	0	1	0	0	0	1	1
18	IN	2	1	1	0	1	1	0	0	0	0	0	2
	OUT	2	3	0	0	0	1	0	0	1	1	0	2

		PEG for 0000 t0 1100 Hours											
LINE		18	17	16	15	14	13	12	11	10	9	8	7
2	IN	3	2	1	5	2	0	0	0	0	0	0	0
	OUT	2	0	0	0	1	2	0	1	0	2	0	1
13	IN	2	1	3	1	0	0	1	1	0	1	2	0
	OUT	1	2	1	1	1	1	1	0	0	0	2	1
3	IN	3	1	2	0	0	1	2	0	1	1	0	0
	OUT	2	2	0	1	1	0	1	0	0	0	1	1
18	IN	2	1	1	0	1	1	0	0	0	0	0	2
	OUT	2	3	0	0	0	1	0	0	1	1	0	2

REPORT STATUS: REPORT SUCCESSFULLY COMPLETED

4.4.7 Busy Hour (07)

BUSY HOUR TRAFFIC REPORT
Measured over the 24 hours ending 0000 Hours
START DATE: 12-04-1994 END DATE: 12-05-1994
LINE/GROUP(S): Ohio 694

TOTAL CALLS: 94

CIRCUIT DATA	COMBINED	INCOMING	OUTGOING
Hour Beginning	12-04-1997@0900	12-04-1997@0900	12-04-1997@0900
Max. # Ckts. Busy	16	8	8
All Busy Seconds	21	11	10
Total CCS	193	106	87
Average CCS	18	14	21
Total Calls	94	55	39
Average Call Seconds	129	103	155
Calls Ring No Answer	4	1	3

REPORT STATUS: REPORT SUCCESSFULLY COMPLETED

4.4.8 Average Transmission Parameters (08)

AVERAGE TRANSMISSION PARAMETERS:
Averaged over the last 48 hour period ending 07 AM, March 28, 1992

GROUP(S): Ohio 694, Ohio 293

TRUNK	LEVEL (dBm)	C-MSG NOISE (dBrnCO)
2 694-2234	-22	25
9 694-8822	-27	21
13 694-8823	-20	24
14 694-8834	-40 *	20 *
20 694-8835	-18 *	29
3 293-1141	-21	30 *
4 293-1142	-37 *	20 *
18 293-1143	-20	23
19 293-1145	-22	20 *

APPENDIX A: UNIT CONFIGURATION

A.1 Items Shipped

This manual shipped with Model LMT-4911-00, Serial # _____

Items Shipped

ITEM & CODE NUMBER	QTY
Basic Unit- One hard disk+floppy disk (-00)	
TMS Module (-03)	
Standard Line Monitor Cards (-01)	
Caller ID Line Monitor Cards (-06)	
CND Receiver (-25)	
Ground Start Monitor Cards (-18)	
Expansion Chassis (-02)	
MF Digit Receiver (-04)	
VF Test/Monitoring Access Card (-08)	
Position ID Tone Transmitter (-17)	
Position ID Tone Receiver Card (-20)	
Position ID Tone Receiver-Caller ID (-26)	
Remote Reset Module (-19)	
Position ID, Monitor Card (-23)	
Position Sender, Handset Driven (-24)	
Position Sender, Contact Driven (-27)	

A.2 Configuration When Shipped

A.2.1 Common Equipment Chassis

COMMON EQUIPMENT CHASSIS

Slot #	Item Installed							S#	MF Receiver -04				Ring Detect				CND Receiver -25 (for -06 card)							
	LM -01	TMS -03	CID -06	CC -15	GND -18	PID -23	Other		1	2	3	4	1	2	3	4	1	2	3	4	5	6	7	8
C1																								
C2																								
C3																								
C4																								
C5																								
C6																								
C7																								

A.2.2 Expansion Chassis

EXPANSION CHASSIS, SLOTS 1 - 16

Slot #	Item Installed					Serial Number	MF Receiver -04				Ring Detect				CND Receiver -25 (for -06 card)							
	LM -01	TMS -03	CID -06	GND -18	Other		1	2	3	4	1	2	3	4	1	2	3	4	5	6	7	8
E1																						
E2																						
E3																						
E4																						
E5																						
E6																						
E7																						
E8																						
E9																						
E10																						
E11																						
E12																						
E13																						
E14																						
E15																						
E16																						

A.3 SITE CONFIGURATION CHART

SITE NAME _____

CONFIGURATION CHART: LINES 1-20

LINE #	LINE NAME	DID	LOOP START	GND START	COMMENTS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SITE NAME _____

CONFIGURATION CHART: LINES 21-40

21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

SITE NAME _____

CONFIGURATION CHART: LINES 41-60

41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					

SITE NAME _____

CONFIGURATION CHART: LINES 61-80

61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					

SITE NAME _____

CONFIGURATION CHART: LINES 81-100

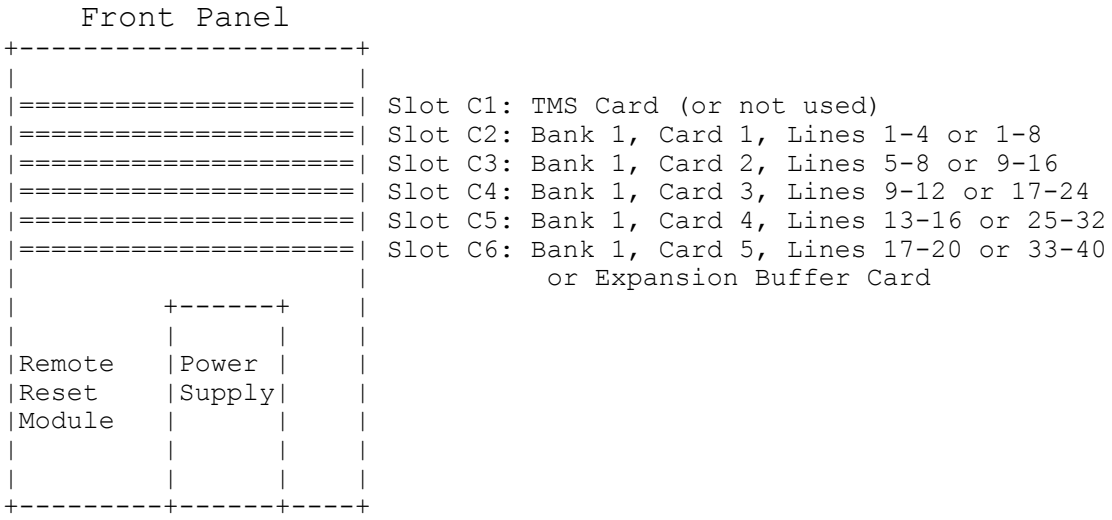
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					

APPENDIX B: CONFIGURING THE COMMON EQUIPMENT CHASSIS

The Common Equipment Chassis (Model LMT 4911-00) houses one TMS Module (-03) and any combination of one to five Standard Line Monitor Cards (-01), Caller ID Line Monitoring Cards (-06), VF Test/Monitoring Access Cards (-08) or Ground Start Monitoring Cards (-18).

B.1 Positions Of The Cards In the Common Equip. Chassis

There are six slots in the Common Equipment Chassis, designated C1 to C6. Cards should be installed in the slots as shown in the following illustration. Note that when the Expansion Chassis is not used, the card for lines 17-20 is installed in slot C6. When the Expansion Chassis is used the Expansion Buffer Card is installed in slot C6 and the card for lines 17-20 is moved to slot E1 in the Expansion Chassis. This move does not affect the location of the line inputs on the rear panel of the Common Equipment Chassis. Lines 17-20 appear on the same connector and pin numbers regardless of the location of their card. When Caller ID Cards, which provide eight lines per card, are employed, up to forty lines may be accommodated within the Common Equipment Chassis. Lines 21 to 40 are terminated on a second connector on the rear panel.



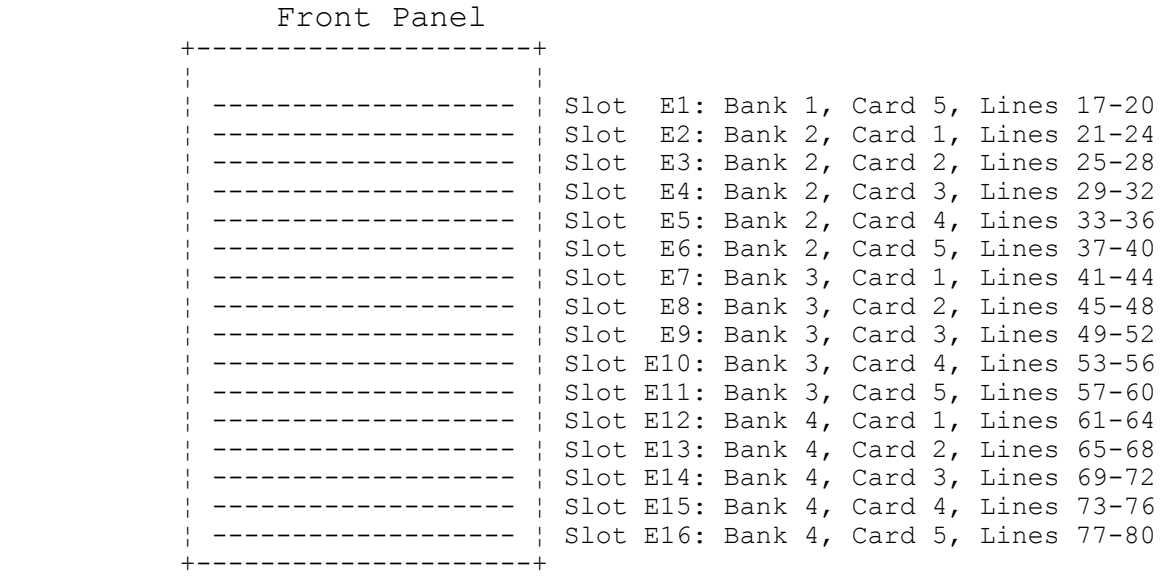
Top View Of Common Equipment Chassis With Cover Removed

APPENDIX C: CONFIGURING THE EXPANSION CHASSIS

The Expansion Chassis (Model LMT 4911-02) houses any combination of one to sixteen Standard Line Monitor Cards (-01), Caller ID Line Monitoring Cards (-06), VF Test/Monitoring Access Cards (-08) or Ground Start Monitoring Cards (-18).

C.1 Positions of the Cards in the Expansion Chassis

There are sixteen slots in the Expansion Chassis, designated E1 to E16. Cards should be installed in the slots as shown below: **Note**, if Caller ID cards are installed, each card/slot shown below can accommodate eight rather than the four lines.



Top View Of Expansion Chassis With Cover Removed

The addresses that must be set for the Standard Line Monitor Cards, Caller ID Line Monitor Cards, and VF Test/Monitoring Access Cards are related to the numbers of the lines connected to them. All cards use a similar addressing scheme, and the DIP switch or jumper/strap settings required for each card position are given in Appendices E or F.

APPENDIX D: CONFIGURING THE TMS MODULE

The TMS Module, if equipped, is always located in Slot 1 of the Common Equipment Chassis. There are three DIP switches on the module which must be set as follows:

SWITCH SW1

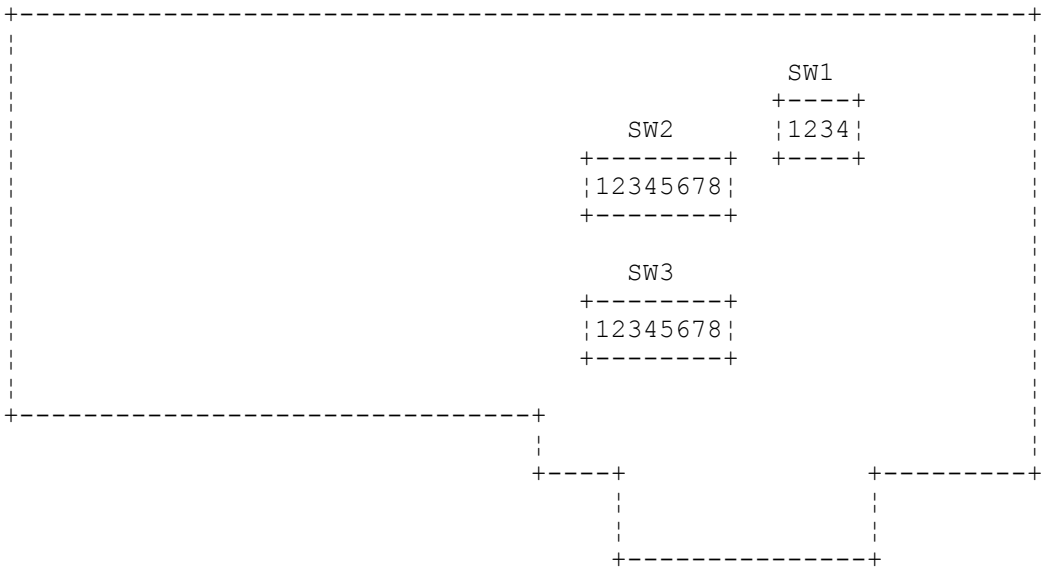
POSITION #	1	2	3	4
SETTING	OFF	ON	OFF	ON

SWITCH SW2

POSITION #	1	2	3	4	5	6
SETTING	OFF	OFF	OFF	OFF	OFF	OFF

SWITCH SW3

POSITION #	1	2	3	4	5	6
SETTING	OFF	OFF	OFF	OFF	OFF	OFF



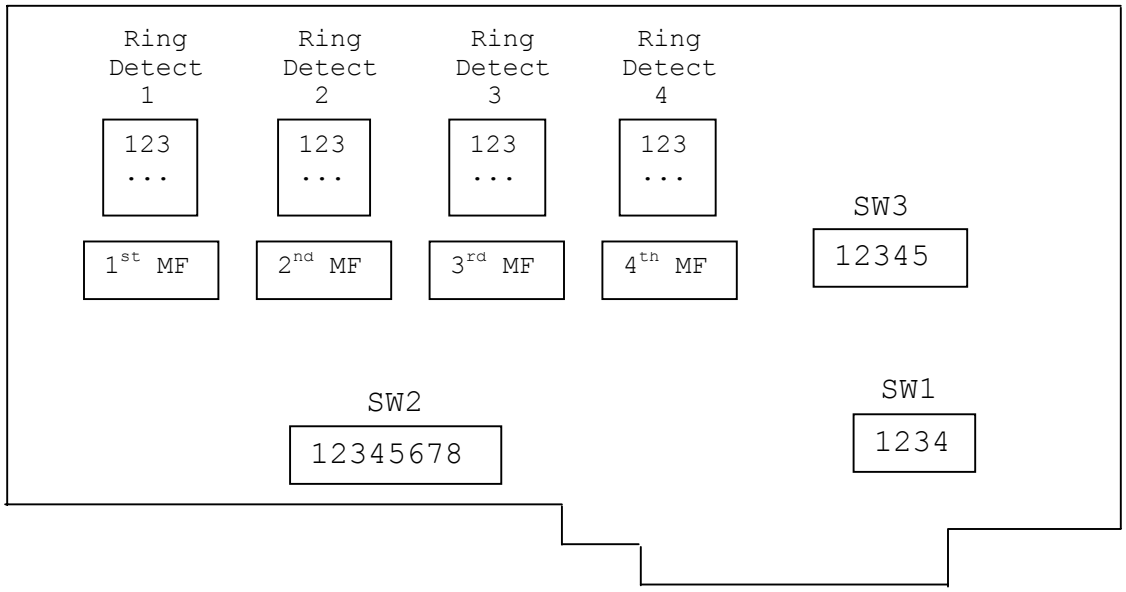
TMS MODULE DIP SWITCH LOCATIONS

APPENDIX E: CONFIGURING THE LINE CARDS

E.1 Standard Line Monitoring, Ground Start and VF Test/Monitoring Access Cards

There are three DIP switches on each Standard Line Monitoring Card and Ground Start Card designated SW1, SW2, and SW3. The VF Test/Monitoring Access Card switches are identical except that switch SW2 is omitted. The switch designations and settings are identical for all three types of cards. There are also Ring Detect jumpers on both the Standard Line Monitor and Ground Start Line Cards.

LAYOUT OF STANDARD, GROUND START AND VF TEST/MONITORING CARDS



E.1.1 DIP Switch Settings

Set DIP switches SW1 and SW3 for these line cards as covered on Chart F1 of APPENDIX F. The chart also gives the switch functions.

Set DIP switch SW2 as covered in Paragraph E.3 of this appendix.

E.1.2 Programming Strap Configuration

Configure the Standard Line Monitor Card for line types as follows:

Loop start: Jump 1-2 (Ring Detector ON), Remove MF Receiver

DID: Jump 2-3 (Ring Detector OFF), Install MF Receiver

NOTE: If MF Receivers are used on a card, there must be an MF Receiver in location 1. Locations 2-4 can be any configuration. If Tone Position Identifier capability is provided, the Tone Position Identifier Receiver must be inserted in the MF Receiver socket in addition to the MF Receiver itself per APPENDIX W.

E.2 Caller ID Line Monitoring Cards

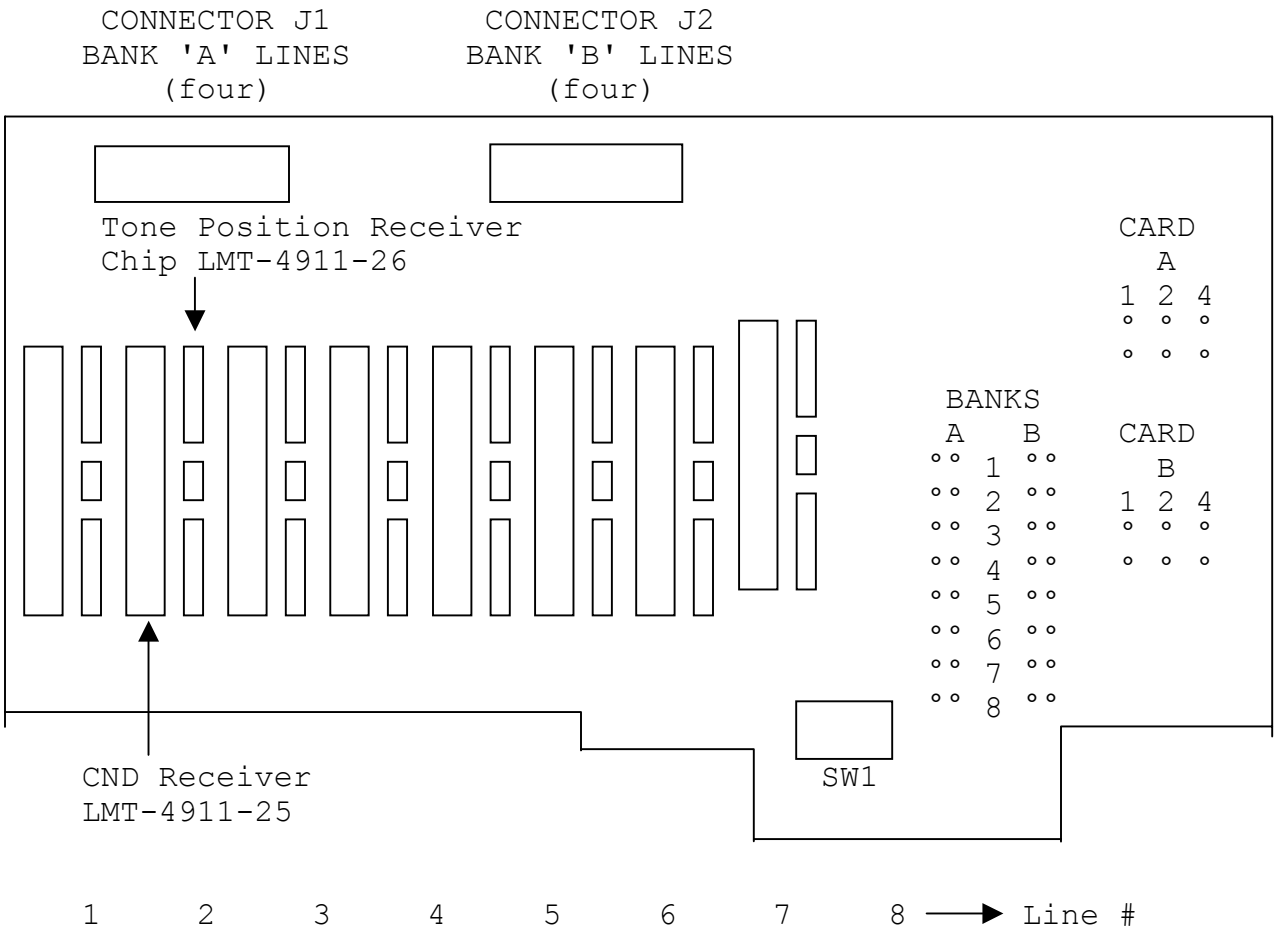
E.2.1 Card Configuration

The Caller ID Line Monitoring Card LMT 4911-06 is actually two independent four-circuit line monitors on a single card. The monitors are designated 'A' and 'B'. Each has its own input cable and an independent set of Bank and Card programming jumpers, and may be set to any Bank (1 thru 6) and Card (1 thru 5) in the system. The two monitor cards must never be set to the same combination of bank and card. They may, however, both be set to the same bank **OR** the same card.

The card is equipped with a single DIP switch (SW1) which is used to determine whether the card functions as the master, or as a slave. Set this switch as covered in Paragraph E.3 of this appendix.

The card is also equipped with eight sockets which accept CND Receivers (-25), and eight sockets which accept Tone Position Identifier Receivers (-26). Refer to the appropriate appendices for information on the installation of these devices, if required. No programming straps are associated with these devices.

LAYOUT OF CALLER ID LINE MONITORING CARD



E.2.2 Programming Strap Configuration

There are two independent sets of programming straps on the card, one for each four line monitor card. Each pair consists of a Bank Set and a Card Set and are labelled 'A' or 'B'.

E.2.2.1 Configuring the Bank Programming Straps

Each bank strap consists of a set of eight pin pairs, one for the 'A' bank, and one for the 'B' bank. The pairs are numbered 1 through 8. Place a single strap horizontally across the pair corresponding to the desired bank. If a four line monitor is to remain unused, do not strap any bank.

E.2.2.2 Configuring the Card Programming Straps

Each strap consists of a set of three pin pairs, one for the 'A' CARD, and one for the 'B' CARD. The card selected is one greater than the numerical value (from zero to four) set by placing from 0 to 2 straps across the pin pairs. The pairs are numbered 1,2 and 4 in binary fashion. The number programmed is the sum of the values of the straps placed across the pin pairs, as shown in the following table.

CARD NUMBER	STRAP # 1	2	4
1	out	out	out
2	IN	out	out
3	out	IN	out
4	IN	IN	out
5	out	out	IN

E.2.2.3 Line Number vs Strap Chart

As indicated above, two jumper/straps must be placed in order to assign each four line circuit group to a specific bank of line terminations on the Caller ID card. One of these jumper straps is placed on the strap field marked BANKS A - B and the second jumper/strap is placed on one of the two strap fields marked CARD A or CARD B. When straps are placed in the BANK A field the related jumper strap must be placed in the CARD A field and when a jumper/strap is placed in the BANK B field the corresponding jumper/strap must be placed in the CARD B field. Chart F2 in APPENDIX F shows the required strapping for each possible four line group. In actual operation, a mix of Caller ID and Standard Line Cards is anticipated and therefore all line numbers shown in Chart F2 will not necessarily be accommodated by Caller ID Cards. Nevertheless, the line numbers assigned to Caller ID Cards should be strapped as shown in Chart F2.

E.3 Master-Slave DIP Switch SW2 Settings (all card types)

On all line cards, DIP switch SW2 sets the Master-Slave function. One card in the system has to be set as Master. All others MUST be set as Slaves.

Set the Master-Slave function on DIP switch SW2 as follows:

MASTER

POSITION #	1	2	3	4	5	6	7	8
SETTING	off	off	off	ON	off	off	off	-

NOTE: Position 8 may not be equipped. If present, it is not functional and may be in either setting.

SLAVE

POSITION #	1	2	3	4	5	6	7	8
SETTING	off	off	off	off	off	off	ON	-

NOTE: On Caller ID Line Cards, the Master/Slave switch is a seven position DIP switch with the same switch assignments.

APPENDIX F: CARD DIP SWITCH SETTINGS

Chart F1 - Standard Line Monitoring Card DIP Switch Settings

On = switch position ON, x = switch position OFF

LINES	SLOT #	BNK #	CRD #	SW1-CARD# 1	2	3	4	SW3-BANK# 1	2	3	4	5
1-4	C2	1	1	On	On	On	On	x	On	x	x	x
5-8	C3	1	2	On	On	On	x	x	On	x	x	x
9-12	C4	1	3	On	On	x	On	x	On	x	x	x
13-16	C5	1	4	On	On	x	x	x	On	x	x	x
17-20	C6/E1	1	5	On	x	On	On	x	On	x	x	x
21-24	E2	2	1	On	On	On	On	x	x	On	x	x
25-28	E3	2	2	On	On	On	x	x	x	On	x	x
29-32	E4	2	3	On	On	x	On	x	x	On	x	x
33-36	E5	2	4	On	On	x	x	x	x	On	x	x
37-40	E6	2	5	On	x	On	On	x	x	On	x	x
41-44	E7	3	1	On	On	On	On	x	x	x	On	x
45-48	E8	3	2	On	On	On	x	x	x	x	On	x
49-52	E9	3	3	On	On	x	On	x	x	x	On	x
53-56	E10	3	4	On	On	x	x	x	x	x	On	x
57-60	E11	3	5	On	x	On	On	x	x	x	On	x
61-64	E12	4	1	On	On	On	On	x	x	x	x	On
65-68	E13	4	2	On	On	On	x	x	x	x	x	On
69-72	E14	4	3	On	On	x	On	x	x	x	x	On
73-76	E15	4	4	On	On	x	x	x	x	x	x	On
77-80	E16	4	5	On	x	On	On	x	x	x	x	On

Chart F2

Caller ID Line Monitoring Card Address STRAP/JUMPER Settings

LINES	BANK # PINS	CARD #	JUMP PINS
1-4	A1	A	NONE
5-8	B1	B	1
9-12	A1	A	2
13-16	B1	B	1-2
17-20	A1	A	4
21-24	B2	B	NONE
25-28	A2	A	1
29-32	B2	B	2
33-36	A2	A	1-2
37-40	B2	B	4
41-44	A3	A	NONE
45-48	B3	B	1
49-52	A3	A	2
53-56	B3	B	1-2
57-60	A3	A	4

LINES	BANK # PINS	CARD #	JUMP PINS
61-64	B4	B	NONE
65-68	A4	A	1
69-72	B4	B	2
73-76	A4	A	1-2
77-80	B4	B	4
81-84	A5	A	NONE
85-88	B5	B	1
89-92	A5	A	2
93-96	B5	B	1-2
97-100	A5	A	4

- BANK # PINS = BANKS STRAP FIELD AND PIN TO BE JUMPERED
- CARD # = THE A OR B CARD TO BE JUMPERED
- JUMP PINS = THE PINS CARD A OR B TO BE JUMPERED

APPENDIX G: REMOTE RESET CONTROL

A Line Logg-R equipped with the remote reset module can be connected in such a manner that a selected telephone line serving the facility in which it is located may be used to reset the Line Logg-R's computer.

G.1 RESET COMMAND SEQUENCE

The DTMF reset string format is: #XXX*1

Where:

- # = Clear Buffer, address follows
- XXX = 3 digit address (000-999)
  (as set by DIP switches inside the Line Logg-R)
- * = End of Address
- 1 = Reset Command

(Pound [#] symbol followed by 3 ADDRESS numbers (000 to 999), followed by star [*] symbol, followed by a the number one [1])

G.2 CONNECTING THE TELEPHONE LINE

The remote reset module input consists of a VF pair that may be connected across any telephone line in the facility that normally carries voice traffic. The unit may be reset by placing a call to that line and, once the call is answered, keying in a special DTMF code. The line used may be connected to an individual's telephone instrument or an answering machine. A FAX or modem line may not be used. The line may be one that is also being monitored by the Line Logg-R.

The VF pair is a monitor only pair, with a VF impedance of greater that 10,000 ohms, a ringer equivalent of 0, and a DC resistance of greater than 2 megohms. Thus, the Line Logg-R does not interfere with normal traffic on the line, but monitors for the specific DTMF string. When the string is received the Line Logg-R will reset itself unconditionally without disturbing the traffic on the pair. The reset is hardware induced, and is independent of the state of the Line Logg-R's computer.

The VF pair is connected to pins 24 and 49 or the Line Logg-R's input connector, and appears on the Type 66 block as pair 24, which may be strapped across any line, as desired. TIP/RING polarity does not have to be maintained, and any form of signaling may be used, as long as the DTMF signals generated by the remote caller appear on the pair.

G.3 SETTING THE ADDRESS

NOTE

> Line Logg-Rs are shipped with the address set to 911. If you desire a different address always turn off the power to the Line Logg-R before changing the DIP switches. The Line Logg-R reads the address DIP switches on power-up. Upon application of power, the reset module's circuitry goes through an initializing routine to "learn" its address. The address cannot be changed without removal and reapplication of power.

To set the address, first remove the top cover of the Line Logg-R. The Remote Reset Module's PC board is now accessible at the left hand side of the unit (as viewed from the rear), adjacent to the rear panel. Two DIP switches, with a total of 12 poles, will be seen. The twelve poles are used to select three 4-digit BCD numbers. The bit values and digit values of each pole are screened onto the PC board.

The address digits are coded in BCD (binary coded decimal). In this type of coding, each decimal digit of the address (there are three, 0 to 9) is coded separately with four poles of the switch. The four poles are weighted 8-4-2-1. A pole counts when it is in the off position.

NOTE

A zero in any digit is coded 1010.

For example: To select 379, the corresponding BCD codes are 0011 (3), 0111 (7), 1001 (9). Proceed as follows:

To set the most significant digit (hundreds) of the address, "3" in the this example, the four poles of the DIP switches that comprise the 100's digit should be set to:

```
Bit value 8 - ON  = 0
Bit value 4 - ON  = 0
Bit value 2 - OFF = 2
Bit value 1 - OFF = 1
                   ---
                    3
```

Similarly, to set the "tens" digit of the address, "7" in the example, the four poles of the DIP switches that comprise the 10's digit should be set to:

```
Bit value 8 - ON  = 0
Bit value 4 - OFF = 4
Bit value 2 - OFF = 2
Bit value 1 - OFF = 1
                   ---
                    7
```

Finally, to set the "units" digit of the address, "9" in this example, the four poles of the DIP switches that comprise the 1's digit should be set to:

```
Bit value 8 - OFF = 8
Bit value 4 - ON  = 0
Bit value 2 - ON  = 0
Bit value 1 - OFF = 1
                   ---
                    9
```

On all switches, the bit value is added by setting the switch handle to the "OFF" position. Conversely, zero is added when the handle placed in the "ON" position.

Once the address is set, replace the cover before connecting the power.

APPENDIX H: MODEMS

RAN Systems recommends using modems that are compatible with the Hayes Command set. Do not use modems that auto-baud (eg. a 2400 baud modem that drops to 1200 baud when noise is detected on the line). The LL (**L**ine **L**ogg-R) operates at a fixed baud rate and will not follow such changes.

When connecting a modem to a LL, a "straight" 25 pin RS232 cable should be used between the LL COM (communication) port and the attached modem.

In software versions 1.42 or higher, the LL can be user programmed to output unique modem initialization strings on each COM port. The LL initializes modems at power-up or by using the "SINT" command. This replaces the fixed modem initialization string that was previously transmitted out COM1 and COM2 at LL power-up. The default settings are **No** initialization strings being sent on any LL COM ports.

The LL modem initialization strings are displayed using the DMDM (**D**isplay **M**o**D**e**M**) command.

DMDM

The LL modem string is set using the SMDM (**S**et **M**o**D**e**M**) command.

```
SMDM 1
     1 AT&F,S0=1,E0Q1
     2
     2 AT&F,ATS0=1,ATE0Q1
     3
     3 AT&F,ATS0=1,ATE0Q1
```

where:

- 1, 2 and 3 are the COM port numbers
- AT - Hayes attention command
- &F - Loads factory Generic Template
- S0=1 - Enables Automatic Answer on first ring
- E0 - Echo Off
- Q1 - Quiet Mode: No result codes
- , - 5 second pause between commands

The previous example "SMDM 1" does not have a modem string specified, therefore the modem init string for COM1 will be cleared. When a "," is used, a 5 second pause will occur and then the command immediately following the pause will automatically be issued with the "AT" in front of the command. The modem init string "**AT&F,S0=1,E0Q1**" is a setting that allows the LL to communicate with most Hayes compatible modems.

The setting of the modem string with SMDM **does not** transmit the string out the COM port. The LL initializes modems at power-up or by using the "SINT" command.

The LL modem init string can be sent using the SINT (**S**et **INiT** string) command.

SINT 1
2
3

where:
1, 2 and 3 are the COM port numbers.

Also, the attached modem will be initialized at LL Power-up. The correct procedure for Powering-up a LL with modems attached to its COM port(s) is as follows:

1) Power-down the LL.

2) Power-down the attached modem(s).

3) Power-up the attached modem(s).

4) Power-up the LL.

APPENDIX I: RETROFIT FOR EXPANSION CHASSIS INSTALLATION

I.1 Adding an Expansion Chassis

When an Expansion Chassis is added to an existing Common Equipment Chassis, the Common Equipment Chassis must be modified to accept the Expansion Chassis connections as follows:

Required Parts:

- (1) Main Chassis Rear Power Extender Assembly
- (1) Four Conductor Power Cable(9402B09)
- (1) 50 Pin Ribbon Signal Cable(9402B04)
- (1) 20 Pin Ribbon Control Cable(9402B03)
- (1) Buffer Card(9212B04)
- (1) 66 Block for each new group of 20 lines to be added
- (1) 6/32 x 1/2 screws
- (1) #6 star washer
- (1) 6/32 hex nut

I.2 INSTALLATION PROCEDURE

1. Power down Common Equipment Chassis

2. Remove top covers from Common Equipment and Expansion Chassis

3. If there is a line card in slot#6 of the main chassis, remove it and place it in slot E1 of the Expansion Chassis per APPENDIX C.

4. Install the Buffer Card in slot C6 of the main chassis

5. Remove the slot cover located on the rear panel of the main chassis next to the power switch.

6. Attach the 50 pin Signal cable to the Buffer card in the main chassis. Run the cable along the power supply and out of the hole revealed by the removal of the slot cover.

7. Install the rear power extender assembly in place of the slot cover. The notch on the rear power extender should face the right edge of the back panel. Use the #6 screws to secure the power extender. Connect the ground cable to the back of the top screw of the rear power assembly with the lock washer and hex nut.

8. Connect the internal rear power extender cable to the main chassis power supply.

9. Replace the main chassis top cover.

10. Set the expansion chassis on top of the main chassis with both rear panels facing towards you.

11. Connect the four conductor power cable to the rear power extender on both the main and expansion chassis.

12. Connect the 50 pin Signal Cable between the two chassis.

13. Connect the 20 pin Control cable between the two chassis.

14. Verify/change the configuration of the line cards in the expansion chassis per APPENDICES C and E.

15. Replace the top cover of the expansion chassis.

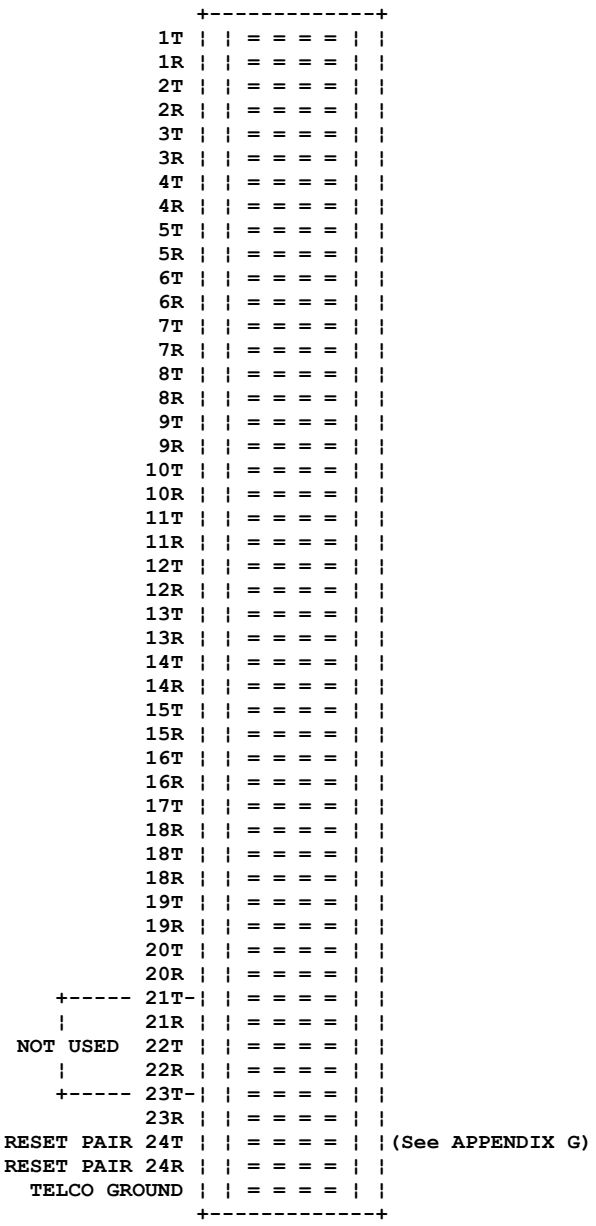
16. Power up the main chassis. The power lights on both chassis should light.

17. Connect the 25 pair VF cable between the expansion chassis' line connector and the new 66 block line terminations.

18. Configure the Line Logg-R's database for the additional lines per Section 4.0 of the "*Installation and Maintenance Manual*".

APPENDIX J: TELEPHONE LINE 66 BLOCK DIAGRAM

J.1 CONNECTOR 66 BLOCK PINOUT



APPENDIX K: DIRECT PAIR CONNECTION DIAGRAM

K.1 Direct Pair Connection Diagram

The Line Logg-R may also be connected directly across the lines to be monitored, although this method of connection is not recommended. Obtain a suitable cable equipped with a standard 25 pair male ribbon connector at the Line Logg-R end, and connect the lines as follows (Note: pins 25 and 50 should be connected to the local telephone ground.)

LINE #	T	R	LINE #	T	R	LINE #	T	R	LINE #	T	R
1	26	1	6	31	6	11	36	11	16	41	16
2	27	2	7	32	7	12	37	12	17	42	17
3	28	3	8	33	8	13	38	13	18	43	18
4	29	4	9	34	9	14	39	14	19	44	19
5	30	5	10	35	10	15	40	15	20	45	20
									RESET	49	24
									GROUND	50	25

(See APPENDIX G)

APPENDIX L: LINE LOGG-R NETWORK SECURITY SYSTEM

The Network Security System protects the Line Logg-R from unauthorized local and remote user access. To operate the Line Logg-R command set, a user must have an account (assigned user number and log on password). These can only be assigned by the Superuser (SU) or System Manager (SM) via a set of password control commands.

To additionally guard against unauthorized entry, when no user is logged on, no indication of log on requirements are sent to the terminal device. Similarly, entry of an incorrect password does not generate any such indication.

Internal security is provided by restricting the commands that can be invoked by each user, according to the responsibility level assigned to the user. Each user can be assigned an individual set of commands.

L.1 Initial Security System Configuration

When the Line Logg-R is shipped the security system is configured as follows:

1. Only the Superuser (User 01) and System Manager (User 02) accounts are active.

2. The SU's initial password is 'SUPERUSER'.

3. The SM's initial password is 'SYSTEM MANAGER'.

4. The SU has the capability of using any command unless a command was disabled by the SU with the SUSR command.

5. The set of allowed commands for the SM is restricted. The set is sufficient for most applications, and can be expanded or restricted by the SU if required. The set of allowed commands, which are stored in the software, is given in APPENDIX M.

6. The set of allowed commands for all other users (when enabled) is restricted to a minimum. The set can be expanded or restricted further by the SU. The list of allowed commands, which are stored in the software, is given in a later section of this appendix.

L.2 Logging On

Initially, only the SU or SM can log on. The SU and SM can then activate (open accounts for) new users as required. As they open accounts for others the list expands. Any user of any level can log on to either port (COM1 or COM2), and both ports can be used simultaneously (the same user may even log on to both ports simultaneously, if necessary).

The Set Log On (SLOG) command is used to log on the system. This is the only command the Network Security System will accept from an idle terminal device.

```
=>SLOG nn
          nn    = User number (01-20)
          01    = Superuser
          02    = System Manager
          03-20 = Other users
```

A user desiring to log on sees a prompt '=>', and would enter the following (SU is illustrated):

```
=>SLOG 01
```

The reply is:

```
PASSWORD?
```

The user then types his password (in this case "SUPERUSER"). The password must be 8-16 characters long (No Spaces) and all characters used must be printable. The password is not echoed to the screen. Case is ignored. If the password is correct the Line Logg-R replies with:

```
WELCOME TO THE LINE LOGG-R SYSTEM

=>
```

If the password is incorrect, the reply is:

```
COMMAND ERROR:  System Access Denied

=>
```

L.3 Logging Off

The Set Log Out (SOUT) command is used to log off the system. The user enters:

=>SOUT

The reply is:

LINE LOGG-R SYSTEM LOG OFF

=>

L.4 Activating New Users

New users can only be activated by the SU or the SM. The SU can activate (and deactivate) all users except himself (the SU can never be deactivated). The SM can activate or deactivate all users except the SU and SM.

To activate a new user, the SU or SM must first select an inactive user number. This is best done by invoking the Display Active User (DAUS) command to display a list of all assigned user accounts on the system and selecting the lowest unused number. Next, a password for the new user should be selected. The password selected should be new and original. The SU or SM must not assign temporary trivial passwords, such as 'USER #10' or 'PASSWORD', since this exposes the system to risk until the new user changes his password.

The new user is then activated by invoking the Set Password Command (SPWD), and assigning the password to the selected user number.

L.5 Changing User Passwords

L.5.1 Superuser

The Superuser (SU) can change his own and all other passwords. The Superuser's password is active at start up and has an initial password of 'SUPERUSER'. As stated earlier, the SU password should be changed immediately after initial log on. The SU must be logged on before a password change can occur. To change a password, the Superuser must invoke the Set Password (SPWD) command.

The SU need only know the user number to be changed and his own password. He then invokes the Set Password (SPWD) command:

=>**SPWD** nn

nn = User number (01-20)
01 = Superuser
02 = System Manager
03-20 = Other users

If the superuser is changing their own password, the following prompts will be received:

=>OLD PASSWORD?
=>NEW PASSWORD?
=>VERIFY PASSWORD?

If the superuser is changing someone elses password, the following prompts will be received:

=>PASSWORD?
=>NEW PASSWORD?
=>VERIFY PASSWORD?

NOTE: The '=>PASSWORD?' prompt is the superuser's password.

L.5.2 System Manager

The System Manager can change his own and all other passwords, except the Superuser's. The SM's password is active at start up and has an initial password of 'SYSTEM MANAGER'. As stated earlier, the SM password should be changed immediately after initial log on. The SM must be logged on before a password change can occur. To change a password, the SM must invoke the Set Password (SPWD) command.

The set password sequence required for the SM to change their own password or the password of another user is the same as that used by the superuser. The SM need only know the user number to be changed and his own password. He then invokes the Set Password (SPWD) command in the usual manner (see Superuser).

L.5.3 Regular User

A regular user can change only his own password. He must first be activated by the SU or SM and then must log on via the SLOG command, before a password change can occur.

The set password sequence required for the user to change his own password is the same as that used by a Superuser. The user needs to know both his user number and his own password. He then invokes the Set Password (SPWD) command in the usual manner (see Superuser).

L.6 Deactivating Users

The Deactivate User (SDUS) command is used by the SU or SM to deactivate an assigned user account from the system. Users cannot deactivate themselves or other users. Deactivation removes the user's password, thus deactivating their user number. The deactivated user number may then be reactivated at any time by assigning it a new password with the Set Password (SPWD) command. The Superuser can not be deactivated. The selected user is deactivated by entering:

=>**SDUS** nn

Where nn is the user number (02-20 for the SU, 03-20 for the SM).

L.7 User Command Restriction

A separate table of commands is stored for each user, and also for the SM, thus allowing the SU to tailor the allowed command set for each user to that user's responsibilities. The SU can change all command sets.

L.7.1 Displaying The Allowed Command Set

The set of allowed commands for any user can be displayed by invoking the Display User Command (DUSR) command:

=>**DUSR** uu
uu = User Number (02-20)

L.7.2 Changing The Allowed Command Set

To allow or disallow a command the SU invokes the Set User Command (SUSR) command:

```
=>SUSR uu cccc E
               D

          uu   = User Number (02-20)
         cccc  = Command Verb (4 letters)
          E    = Allow
          D    = Disallow
```

L.7.3 System Manager Command Set

The SM command set, when shipped, is as follows:

CRPT, DENL, DCOM, DGRP, DLNM, DGNM, DTPE, DTST, DUSR, SCOM, SDGP, SDIS, SDTE, SENL, SDUS, SGNM, SGRP, SLNM, SLOG, SMES, SOUT, SPWD, STNE, STME, STOP, STPE, STRT, STST, SHLV, DHLV, DTME, DDTE, DVER, DDIR, CARC, DARG, SARG, SUSR, SINT, DMDM, DAUS, SMNU, CSCF, RSCF, DSTE, SSTE, SIOT, SDEF, DXDB, SXDB, DXLG, DOSD, SOSD, SDOS, DALO, SALO, DCLK, SCLK, DCST, DCPP, SCPP

L.7.4 User Command Set

All user command sets, when shipped, are as follows:

CRPT, DGRP, DLNM, DGNM, DTPE, DUSR, SLOG, SOUT, SPWD, DTME, DDTE, DVER, DDIR, CARC, DARG, SMNU, DSTE

L.7.5 Automatic Log-off Feature

The Line Logg-R is equipped with automatic log-off capability. This feature logs off any user that fails to input signals on either COM port in a user defined interval. This interval is set via the SALO command as covered in APPENDIX M. The DALO command displays this interval setting.

APPENDIX M: MASTER COMMAND SET

The command set consists of three types of commands: (S)et,(D)isplay, and (C)reate. Each type begins with the letter in parenthesis and ends with a carriage return [CR]. Related commands, where applicable, are included with each listed command (ie., RC=AAAA where AAAA is the related command name).

M.1 Commands

COMMAND	ACTION	REPLY
CARC	Copies raw call data files from hard disk to floppy disk without deletion. Copies one day, from 0000 to 2359 hours.	DATE (mm/dd/yy)?
CARC PP	Copies pre-processed call data files From hard disk to floppy disk without deletion. Copies one day, from 0000 to 2359 hours.	DATE (mm/dd/yy)?
CRPT r x PRN Ggg COM1 Ggg,x COM2	Creates a report r = Report Type 1 = Traffic Summary (TS) 2 = Average Call Duration (ACD) 3 = Chronological Detail (CD) 4 = Maintenance Detail (MD) 5 = Multi Line Detail (MLD) 6 = Peg Count (PC) 7 = Busy Hour (BH) 8 = Transmission Parameters (TP) (Number or acronym may be entered) gg = group (G1-G16) x = line number or numbers (1-80) 65 characters maximum per command line. (lines do not have to be in numerical order) PRN = to local printer COM1 = out RS-232 Port 1 COM2 = out RS-232 Port 2	DURATION (hh)? END (mm/dd/yy:hh)?
CSCF (See APPENDIX P)	Creates a back-up System Configuration File	
<Ctrl>X	Cancels all current user processes. (Hold down control key on the keyboard and press X.)	

DALO u — Display Automatic Log out threshold for User u
u = 1 for user 01
u = 2 for users 02 to 20

RC=SALO — Set Automatic Log out threshold

DANI — Display Enhanced ANI status
(See APPENDIX AC)
RC=SANI — Set Enhanced ANI status

DARG — Displays the hours that automatic report generation occur.
(See APPENDIX Q)

```
AUTOMATIC REPORT GEN.
REPORT ACTIVATION HRS
---------------------
0   1               12
-- ---.............---
ON OFF             OFF

13  14               23
--- ---.............--
OFF ON              ON
```

RC=SARG — Set Automatic Report Generation parameters.

DARG hh — Displays status of automatic report generation for specified hour
hh = hour of generation

```
AUTOMATIC REPORT GEN:
   TIME   - hh:00
   STATUS - on (off)
   REPORTS- (list)
   GROUPS - (list)
   OUTPUT - (Device)
   DURATION-(hours)
```

RC=SARG — Set Automatic Report Generation time

DAUS — Displays a list of all assigned user numbers

```
ACTIVE USERS:
   01,02,....20
```

RC=SPWD — Assigns new user numbers and passwords
RC=SDUS — Deactivates user number

DCCF — Display Clock Correction Factor
(See APPENDIX S)
RC=SCCF — Set Clock Correction Factor

DCLK — Display system clock mode.
(See APPENDIX O)

```
CLOCK TYPE:  External
```

RC=SCLK — Set system clock mode.

DCOM 1 Displays RS-232 Port settings COMx b,n,p,s,H
2 F
3
b = baud rate
(300,600,1200,2400,4800 or 9600)
x = port# 1 or 2
n = bits (7 or 8)
p = Parity (E,O,N)
s = Stop Bits (1 or 2)
F = Full Duplex
H = Half Duplex
RC=SCOM Set COM Port parameters

DCPP Display call pre-processing status.
(See APPENDIX AB)
RC=SCPP

DCST Show state of internal master clock,
status display feature.
(See APPENDIX O)
RC=SCST Activate and direct the internal master
clock status display.

DDIR Displays directory Directory
of raw call data

DDIR PP Displays directory of Directory
pre-processed call data

DDTE Displays date DATE: mm/dd/ccyy

RC=SDTE Set date

DENL Displays line(s) enabled LINE USE:
and disabled where: 01x,02x,....10x
x = E for enabled 11x,12x,....20x
x = - for disabled | | | |
| | | |
71x,72x,....80x
RC=SENL Enables lines for monitoring
RC=SDIS Disables lines from monitoring

DFUS x Display fuse status of specified line.
(Only valid for -01 line monitor cards)

DGNM Displays list of all GROUP NAMES:
group names versus 01:name 02:name
their numbers. | |
15:name 16:name
RC=SGNM Assign or change a new Group name

DGRP Ggg — Displays lines that are grouped together for report purposes; gg = group number (1-16). GROUP Ggg: x,.....,x / x,.....,x

RC=SGRP — Adds or deletes lines from existing groups

DHLV x — Displays hold voltage threshold for line x. LINE HOLD x: vv.vv

RC=SHLV — Set hold voltage threshold for specified lines

DLNM — Displays list of all line numbers and names.

```
LINE NAMES:
   01:name   02:name
      |         |
   71:name   80:name
```

RC=SLNM — Assigns or changes names of individual lines

DMDM — Display modem initialization strings for all communication ports.

```
MODEM INIT STRINGS
   COM1: AT&F,S0=1,E0Q1
   COM2: AT&F,S0=1,E0Q1
   COM3: Not    Assigned
```

RC=SMDM — Assigns or changes modem init string

DOGT (See APPENDIX Z) — Display Out of Service detection thresholds for all Groups. G1-4,G2-3,etc

RC=SOGT — Set Out of Service threshold for specified group

DOMX (See APPENDIX Z) — Display Out of Service Detection Matrix

DOSD (See APPENDIX Z) — Display Groups with Out of Service Detection enabled. G1,G3...

RC=SOSD — Enable Out of Service Monitoring on specified Groups

RC=SDOS — Disable Out of Service Monitoring on specified Groups

DPOS — Display position identification status.

DSTE (See APPENDIX R) — Displays site name

RC=SSTE — Assigns or changes site name

DTME — Displays time. TIME: hh:mm:ss

RC=STME — Sets current time

DTNE Displays test set tone settings (does not start or stop tone). LINE #: 01, SENDING -0dBm 1004Hz

RC=STNE	Set test set tone setting and starts/stops tone
RC=STST	Connects a specified line to the test set
RC=DTST	Displays which line is connected to the test set
RC=SMES	Make test set measurement with supplied parameters

DTPE Displays line type(s) where:
x = L for Loop start
x = G for Ground start
x = D for DID E911
x = E for GTE E911
x = R for Ring Down circuits

LINE TYPES:
01x,02x,....10x
11x,06x,....20x
| | | |
71x,72x,....80x

RC=STPE	Set line type on specified lines

DTST Displays line connected to test set TESTING: l

RC=STST	Connects specified lines to the test set

DUSR uu Displays list commands available to user uu.
uu = User Number (1-20)

USER uu COMMANDS:
CRPT,...,SMNU

DVER Displays software version, unit serial number and special notes. LINE LOGG-R: x.xx
(See APPENDIX T)

DXDB SYS
OSD
CLK
(See APPENDIX AA)

Display Exception Log Database Settings
SYS = System Exception Log
OSD = Out of Service Exception Log
CLK = Clock Synchronization Log

RC=SXDB	Activates/deactivates Exception Log
RC=DXLG	Display the Exception Log for the specified period.

DXLG SYS m,...,m com
OSD
CLK
(See APPENDIX AA)

Display Exception Log for the specified period.

SYS = System Exception Log
OSD = Out of Service Exception Log
CLK = Clock Synchronization Log
m = Calendar months to be included in the report
01=January, 02=Feb, etc. or ALL
com = devices to which report is to be sent, i.e.COM1,COM2,PRN or ALL

RC=DXDB	Display Exception Report Database Settings
RC=SXDB	Activates/deactivates Exception Log

RSCF Restores System Files from a
(See APPENDIX P) back-up disk

SALO u mm Sets Automatic Log-out threshold.
Unit will automatically log-out in
mm minutes if no input signals are
received from either COM port.
u = 1 for Superuser 01
u = 2 for users 02 to 20
mm = 1 to 120 minutes

RC=DALO Display Automatic Log-out threshold

SANI OFF Set the Enhanced ANI status
ON
(See APPENDIX AC)
RC=DANI Display Enhanced ANI status

SARG Enables and disables automatic
(See APPENDIX Q) report generation for a specific
hour.

RC=DARG Displays the times at which automatic
report generation commences.

SARG hh ON r,...,r Ggg,...,Ggg COM1 DUR
OFF ALL ALL COM2
PRN
Specifies and activates
automatic report generation.

AUTOMATIC REPORT GEN:
TIME - hh:00
STATUS - on (off)
REPORTS - (list)
GROUPS - (list)
OUTPUT - (device)
DURATION-(hours)

hh = (0 - 23) Hour in which
the reports are printed.
Reports cover a selectable
duration period ending at
the end of the previous hour.
For example, specifying a 0
report hour and 24 hour duration
will produce report for the previous
full day, hours 0-23.
ON = ARG hour enabled.
OFF = ARG hour disabled.
r = Report acronym or number.
ALL = Create reports for all MIS Report types.
Ggg = Group name or number.
ALL = All lines enabled when the report
is generated.
COM1, COM2, PRN = direct I/O destination
of selected report
DUR = 01 to 24 specifying the duration
of the selected report.

RC=DARG Display Automatic Report Generation status
for a specified period

```
SCCF +/-ss           Set Clock Correction Factor
(See APPENDIX S)        ss = +24 to -24 seconds

      RC=DCCF     Display Clock Correction Factor

SCLK SYS             Set system clock mode.                CLOCK TYPE:  External
     EXT
     TST
     INT baud,dst,tz,sc,tm,zip
                        SYS  = Use Line Logg-R's computer clock.
                        EXT  = Use external master clock.
                        TST  = Send all message received on AUX port
                               to COM2 (See APPENDIX O). This is for
                               installation testing only.
                        INT  = Use RAN Systems internal master clock.
                        baud = baud rate of time broadcast port
                               (1200, 2400, 4800, 9600)
                        dst  = daylight savings time enabled (Y or N)
                        tz   = time zone (0 - 23)
                        sc   = signature control (Y or N)
                        tm   = time message output enabled (Y or N)
                        zip  = Zip code of installation site
                               00000 (Unknown / Cold Start)
                               00001 - 99999

 (See APPENDIX O)
     RC=DCLK      Display system clock mode.

SCOM 1 b,n,p,s,F     Sets RS-232 Port attributes           COMx: b,n,p,s,F
     2         H        b = baud rate(300, 600,                      H
     3                      1200, 2400, 4800 or 9600)
                        n = bits (7 or 8)
                        p = Parity (E,O,N)
                        s = Stop Bits (1 or 2)
                        F = Full duplex
                        H = Half duplex
                      NOTE: the new settings are
                            displayed, but the port
                            is not reconfigured until
                            the unit is rebooted.

     RC=DCOM      Displays the selected COM Port parameters

SCPP OFF             Set call pre-processing.
     ON
     mm/dd/ccyy         mm = month
(See APPENDIX AB)       dd = day
                        cc = century
                        yy = year
      RC=DCPP
```

SCST OFF
COM1
COM2
(See APPENDIX O)

Activate and direct the internal master clock status display.

RC=DCST Show state of internal master clock, status display feature.

SDEF
(See APPENDIX V)

Sets all system configuration files to factory default values

SDGP Ggg x,...,x

Removes line(s) from group number gg (1-16)
x = individual line numbers from 01 to 80

GROUP Ggg:
x,x,...,x

RC=DDGP Displays individual line numbers comprising Group gg.

SDIS x,...,x
Ggg,...,Ggg

Disables line(s) or groups from monitoring.
x = line number(s) from 1 to 80
Ggg = Group numbers from 01 to 16

PROMPT

RC=SENL Enables lines or groups from monitoring
RC=DENL Displays enabled/disabled status of all lines/groups

SDOS Ggg,...,Ggg
(See APPENDIX Z)

Delete Groups gg,...,gg from Out of Service Detection monitoring
gg = group numbers 01-16

RC=DOSD Display groups with Out of Service Detection Monitoring enabled.
RC=SOSD Enable Out of Service Detection Monitoring on groups gg,...,gg.

SDTE mm/dd/yy
mm/dd/ccyy

Sets date

DATE: mm/dd/ccyy

RC=DDTE Displays the current date

SDUS uu

Deactivates user number
uu = User number (02-20)
This command can only be used by users 01 and 02.

PROMPT

RC=DAUS Displays all active user numbers
RC=SPWD Activates new user numbers/passwords

SENL	x,...,x Ggg,...,Ggg	Enables line(s) or Groups of lines for monitoring. x = line number(s) from 1 to 80 Ggg = Group numbers from 01 to 16	PROMPT
	RC=DENL	Displays enabled/disabled status of all lines	
	RC=SDIS	Disables selected lines/groups from monitoring	
SGNM	Ggg name	Assigns a name to Group gg name = 1 to 16 characters (No spaces)	PROMPT
	RC=DGNM	Displays all group names vs group numbers	
	RC=SGNM	Deletes old group name	
SGNM	Ggg	Deletes old name	
	RC=DGNM	Displays all group names vs group numbers	
SGRP	Ggg x,...,x	Adds line(s) to group gg (1-16) which are grouped together for reporting gg = Group Number (01-16) x = Line Number (1-80)	PROMPT
	RC=DGRP	Displays all lines comprising group gg	
SHLV	x,...,x vv.vv	Sets hold voltage threshold for lines x,...,x. vv.vv= voltage from 0 to 63.75 in 0.25 volt increments. Entries in other than 0.25 steps are rounded down. x = 01 to 80	PROMPT
	RC=DHLV	Displays the hold voltage threshold for lines x,x.	
SINT	1 2 3	Sends the modem initialization string to a selected communication port.	
SIOT	(See APPENDIX U)	Executes a system test of CPU, RAM & Hard drive read/write, COM and Printer ports. Directs test message of all ASCII characters to all I/O Ports. Provides a PASSED or FAILED test result message to initiating terminal.	

SLNM x name — Assigns a name and/or number to line x
x = line number (01 to 80)
name = 1 to 16 characters (No spaces)
LINE x: name

RC=DLNM Displays the name assigned to line x.
RC=SLNM Delete old name assigned to line x.

SLNM x — Delete old name assigned to line x

SLOG uu — Requests Log on of user
uu = user number (1-20)
01 = Superuser
02 = System Manager
03-20 = Other users
PASSWORD?
WELCOME TO THE
LINE LOGG-R SYSTEM

SMDM 1
1 "init string"
2
2 "init string"
3
3 "init string"
(See APPENDIX H)

Assigns or changes modem initialization string for selected communication port.
(when no string is specified, the modem init string is cleared. Do not type quote marks)

RC=DMDM Displays modem init string.

SMES LVL R
CNS
CNN
LTA
DCV
FRQ
F/L

Makes one measurement.
Parameter sets mode:
LVL = Level
CNS = C Message Noise
CNN = Noise with Tone
LTA = Long Term Average
DCV = DC Voltage where the display shows:
TIP/Gnd = -nn.n Volts
RING/Gnd = -nn.n Volts
TIP/RING = +/-nn.nn Volts
FRQ = Frequency
F/L = Frequency + Level
R = Repeat until canceled by hitting space bar.

LVL = nn.n DBM
CNS = nn DBRNC
CNN = nn DBRNC
LTA = nn DBM
FRQ = ffff HZ

RC=DTST Displays which line is connected to the test set
RC=STST Connects line x to the test set
RC=STNE Sends tone from test set

SOGT Ggg,...,Ggg hh Set time threshold for groups
(See APPENDIX Z) gg,...,gg to be considered as Out
of Service if no usage is detected
within the threshold period of hh.
gg = group numbers 01-16
hh = 0 Monitoring OFF
hh = 01 to 06 hours for Out of Service Threshold

RC=DOGT Display Out of Service Threshold
for each group with enabled Detection Monitoring.
RC=SOSD Enable Out of Service Detection Monitoring
on groups gg,…,gg.

SOSD Ggg,...,Ggg Enable Out of Service Detection
(See APPENDIX Z) Monitoring on groups gg,...,gg.
gg = group numbers 01-16

RC=DOSD Display Out of Service Detection groups
RC=SOSD Set Out of Service Detection groups

SOUT Logs out current user SYSTEM LOG OFF

RC=SLOG Request user logon.

SPWD uu Activates new user or OLD PASSWORD?
changes password of active NEW PASSWORD?
user. User is automatically VERIFY PASSWORD
activated the first time they
are given a password.
Superuser (01) can change all
passwords.
System Manager (02) can change
passwords 02-20.
Users 03-20 can only change
their own password.
uu = User number (1 - 20)

RC=SDUS Deactivates user uu
RC=DAUS Displays all active user numbers

SSND 1 "string" Send character string to specified communication port.
2 "string" (Do not use quote marks around string)
3 "string"

SSTE Set site name. Max 20 ASCII Characters (No Spaces)
(See APPENDIX R)

RC=DSTE Display site Name

STME hh:mm — Sets time, hour:minute — TIME: hh:mm
hh = hour (00 to 23)
mm = minute (00 to 59)
Time is set to 00 seconds automatically.

RC=DTME — Displays the current time.

STNE xxDBM ffffHz — Sends Tone — TONE ON
OFF — xx = level in -DBM from 0 to 39 — TONE OFF
ffff = frequency in HZ from 0400 to 3600

RC=DTST — Displays the line connected to the test set
RC=STST — Connects line xx to the test set
RC=SMES — Make test measurement with supplied parameters.

STOP — Stops call scanning — PROMPT / NOT STARTED

RC=STRT — Starts call scanning.

STPE L x,..x — Sets the line type — PROMPT
G
D
E
R
L = Loop Start
G = Ground Start
D = DID E911
E = GTE E911
R = Ring Down circuits
x = line number(s) from from 1 to 80.

RC=DTPE — Displays the type for each enabled line

STRT — Starts call scanning — PROMPT / NOT STOPPED

RC=STOP — Stops call scanning.

STST x — Patches line x to internal test set. Does not stop monitoring. Requires TMS card option. — PROMPT
x = Line Number (0-80)
0 = disconnects the test set

RC=DTST — Displays the line connected to the test set
RC=STNE — Sends tone from the test set
RC=SMES — Make test measurement with supplied parameters

SUSR uu cccc E — Allows or disallows user's — PROMPT
D — operation of command cccc
uu = User number (01-20)
cccc = Four letter command verb
E = Enable
D = Disable

SXDB SYS months com,...,com Activates/deactivates the exception log.
OSD
CLK
(See APPENDIX AA)

SYS = System Exception Log
OSD = Out of Service Exception Log
CLK = Clock Synchronization Log
Months = quantity of months to be included in the Exception Log 0 to 12. 0 will disable the Exception Log.
Com = COM1, COM2, PRN or ALL

RC=DXLG Displays the Exception Log for the specified time period.
RC=DXDB Displays the Exception Log's database parameters.

APPENDIX N: SPECIFICATIONS

N.1 General

Number of Lines Monitored:
- Standard System: 1 to 40
- Expanded System: Up to 80

Modularity: May be expanded in groups of 4 or 8 lines by the insertion of additional Line Monitor Cards or Caller ID cards respectively.

Expandability: Line Logg-R expansion chassis may be added to provide up to 80 lines capacity in a single system. With special assembly can provide up to 100 lines.

Types of Lines Monitored:

Number of wires: 2 Wire

Supervision (selectable independently for each line monitored):
- Loop Start
- Ground Start
- Reverse Battery DID

Impedance:
- DC: Greater than 1 Megohm
- AC: Greater than 50K

Ringer Equivalence: .1 REN

DTMF Receiver:

- Sensitivity: 0 to -30 dBm two tone average
- Digits Received: All 16, including A, B, C, D, #, *
- Digit Duration: 40 msec minimum
- Interdigit Time: 40 msec Minimum

MF Receiver:

Type:	R1 per BELL specifications
Sensitivity:	0 to -25 dBm two tone average
Digits Received:	All 15, with KP and ST, ST1, ST2,ST3
Digit Duration:	55 msec minimum
Interdigit Time	30 msec minimum

Supervision Threshold (programmable independently for each line monitored):
Line is noted as busy when lead (T or R, depending on supervision type) falls below setting:
0 to 63 VDC in 0.25 V steps

Events recorded:
Ring No Answer (number of rings)
Incoming ring (number of rings before seizure)
Seizure
DTMF digit string (up to 15 digits)
MF digit string (up to 15 digits)
Caller Identification (name and/or number)
Hook Flash
Wink
Release

Traffic Density:

Long Term Average:

Per Line:	300 calls/line per 48 hour period
System:	6000 calls per 48 hour period

Short Term Peak: 2 calls/line per minute for 4 minutes

Data Retention:

Method:	Data transferred to non-volitile storage medium once every minute
Media:	400mB or larger Hard Disk
Overflow Protection:	Oldest 1 day of data erased when disk becomes full

Retention Capability:
Hard Disk:
Time: 62 days typical
Statistical Basis:
Average traffic density: 70 calls/line/day
Number of lines monitored: 80
Total Calls: 350,000

N.2 VF Testing

Capability: Level and Noise Measurement
Tone Generation
DC Voltages T-G, R-G, T-R

Termination: Bridging across line

Level Measurement:

Frequency Range: 400 to 3600 kHz
Level Range: 0 to -40 dBm
Accuracy: +/- 0.2 dB (0 to -20 dBm)
+/- 0.5 dB (-21 to -40 dBm)
Resolution: 0.2 dB

Long Time Average (Voice Traffic Level) Measurement:

Frequency Range: 400 to 3600 kHz
Level Range: 0 to -40 dBm
Accuracy: +/- .5 dB
Resolution: 0.2 dB

Noise Measurement:

Types: C-Message and C-Notch
Filter/Notch: Per IEEE 743-1984
Measurement Range: 25 to 70 dBrnC0
Accuracy: +/- 1 dB
Resolution: 1 dB

Frequency Measurement:

Frequency Range:	300 to 5000 Hz
Level Range:	0 to -20 dBm
Accuracy:	+/1 0.1%, +/- 1 Hz
Resolution:	1 Hz

Tone Generation:

Frequency Range:	400 to 3600 Hz
Frequency Accuracy:	+/- .1%
Level Range:	0 to -39 dBm
Level Accuracy:	+/- 0.5 dB with properly terminated line
Level Resolution:	1 dB

DC Voltage Measurement:

Measurement Range:	
TIP or RING to Ground:	0 to -63 Volts DC
TIP to RING:	0 to +/- 63 Volts DC
Accuracy:	+/- 0.25 Volts
Resolution	0.25 Volts
Reporting:	Single or repetitive
Single:	Request for DC Voltage measurement produces report of all three voltages
Repetitive:	TIP to RING voltage and line number reported 10 times a second until canceled

N.3 Power

Power:	115 V AC +/- 10%, 60 Hz, 150 Watts max

N.4 Connectors

Location: All on rear panel

VF Line Connector:

Type: Standard 25 pair female

Pinout:

LINE #	T	R	LINE #	T	R	LINE #	T	R	LINE #	T	R
1	26	1	6	31	6	11	36	11	16	41	16
2	27	2	7	32	7	12	37	12	17	42	17
3	28	3	8	33	8	13	38	13	18	43	18
4	29	4	9	34	9	14	39	14	19	44	19
5	30	5	10	35	10	15	40	15	20	45	20
									RESET	49	24
									GROUND	50	25

(See APPENDIX G)

Line Under Test Connector: Type 310 and RJ-41 Jack (connected across input to TMS card)

Audio Out Connector: Type 310

Control Port Connectors:

Number: Two
Type: DB-25 Female
Format: DTE
Pinout: Per RS-232C
Signals: Tx, Rx, DSR, RTS, DTR, CTS, DCD, SGND

Printer Connector: Standard IBM PC (DB 25 Female)

Power Connector: Standard 3 pin, Type IEC-330-C-13

N.5 Mechanical

Size:	16" wide x 14" deep (excluding connectors) x 6.9" high (4 rack spaces)
Mounting:	Rack ears provided for WECO and RETMA 19" and 23" racks. May be positioned for flush panel or forward mounting
Weight:	15 Pounds

APPENDIX O: System Clock Synchronization

In software versions 1.44 or higher, the Line Logg-R clock can run in four different operating modes. Each mode has varying degrees of accuracy. The following are the four modes available:

1) **SYS** (**SYS**tem) - when the Line Logg-R is set to run in system mode, the Line Logg-R uses the system clock to maintain clock accuracy. In this mode, a CCF (**C**lock **C**orrection **F**actor) can be set via the SCCF command to maintain an accurate clock of +- 1 seconds per day. See APPENDIX S on Clock Correction Factor commands.

2) **INT** (**INT**ernal) - when the Line Logg-R is set to run in the INT clock mode, the Line Logg-R derives its time from the internal RAN Precision Clock Source. This precision clock maintains an accurate clock of +-.1 seconds when locked to the UTC time source.

3) **EXT** (**EXT**ernal) - when the Line Logg-R is set to run in the EXT clock mode, the Line Logg-R derives its time from an external precision clock source. The external time source should maintain an accurate clock of +- 0.1 seconds when locked to the UTC (**U**niversal **T**ime **C**oordinated) time source. The Line Logg-R AUX port's baud rate, data bits, stop bits and parity should be set identical to the precision clock's broadcast port. This can be accomplished via the SCOM (**S**et **COM**munication) command.

4) **TST** (**T**e**ST**) - when the Line Logg-R is set to TST clock mode, any characters received on the AUX port of the Line Logg-R will be echoed to COM2. The Line Logg-R AUX port's baud rate, data bits, stop bits and parity should be set identical to the precision clock's communication port. COM2's baud rate must be greater than the AUX port's baud rate to prevent display errors. Both can be accomplished via the SCOM (**S**et **COM**munication) command. This clock mode should only be used during the installation and test process.

The Line Logg-R Clock mode is displayed using the DCLK (**D**isplay **CL**oc**K** mode) command.

DCLK

The Line Logg-R Clock mode is set using the SCLK (**S**et **CL**oc**K** mode) command.

SCLK SYS
INT baud,dst,tz,sc,tm,zip
EXT
TST

where:

baud - baud rate of time message port 1200, 2400, 4800, 9600

dst - daylight savings time enabled
Y or N

tz - time zone
00 - 23

sc - signature control enabled
Y or N

tm - time message output enabled
Y or N

zip - zip code of installation site
00000 (Unknown / Cold Start)
00001 - 99999

During installation of the Internal RAN Precision Clock the craftsperson may want to observe the synchronization of the clock with the GPS satellites. There are two commands available to setup and watch this progress:

The command DCST (**D**isplay **C**lock **ST**atus) is to show if the Clock Status Display feature is active and on which port.

DCST

The command SCST (Set Clock STatus) is used to activate and direct the clock status display to a specified communication port of the Line Logg-R.

SCST OFF
COM1
COM2

Upon activation of the Clock Status display feature, the date, time, clock status, latitude, longitude and GPS satellites being acquired will be displayed. They will continue to be displayed until the Line Logg-R receives a valid clock string. At this time, the Line Logg-R clock will be synchronized and the clock status display will be disabled automatically.

APPENDIX P: SYSTEM CONFIGURATION FILE BACK-UP AND RESTORE CAPABILITY

In software versions beginning with 1.41 and higher System Configuration Back-up capability has been added. The capability to archive and restore the system configuration allows the craftsperson to back-up and restore the current system configuration files of the Line Logg-R. An ASCII file of the system configuration is also saved on the disk in a file named README. This permits manual restoration of the system configuration, if necessary.

The system configuration back-up files are software version dependent. Thus, backed-up system configuration on floppy disk can only be restored to its corresponding software version on the hard drive.

The System Configuration back-up command should be run, at minimum, after each Line Logg-R software installation or version update. This will insure that the Line Logg-R will be backed-up for every software version and can be restored via user command. The restore command will alert the craftsperson if there is a version mismatch. To remedy the version mismatch problem, use a back-up disk with the same version of system configuration files as the current software.

The system configuration files are backed-up by placing a formatted floppy disk in the data disk drive on the front of the Line Logg-R and using the Create System Configuration Files (CSCF) command.

CSCF

The system configuration files are restored by:

1. Placing the current software version's system configuration floppy disk in the data disk drive on the front of the Line Logg-R.

2. Using the Restore System Configuration Files (RSCF) command.

RSCF

Both the CSCF and RSCF commands require a formatted 1.44 megabyte, 3.5", double-sided, high density floppy disk.

APPENDIX Q: AUTOMATIC REPORT GENERATION

ARG (**A**utomatic **R**eport **G**eneration) is included in all Line Logg-Rs with software Version 1.38 or higher.

Q.1 Description and Function

ARG provides the capability to produce from 1 to 24 administrable automatic MIS reports each day. Reports are produced on the hour for each hour in which ARG is enabled. MIS reports can be generated for any desired duration from 1 to 24 hours with the period ending at the hour in which the reports are printed.

The user can define which MIS reports are produced, and the line groups which they cover, independently for each ARG hour. Only one set of data may be defined for each hour in the day. A block of one to five reports and a set of line groups are defined for each ARG hour. A separate block of reports is then produced for each group of lines. Any line group, however, may be used in any or all the ARG hours.

Activating an ARG hour causes the Line Logg-R to automatically generate the defined MIS reports when this time of day is reached. Reports can be directed to either COM1, COM2 or the local printer. A separate block of MIS reports is created for each line group defined for that ARG hour.

Defining the reports and groups for an ARG hour is accomplished by means of the SARG command. This command can be used in either of two ways. Reports and groups can be defined for a particular hour, or the command can be used to turn them on or off without altering their definition.

Manual reports may be generated regardless of whether Automatic Reporting is enabled or disabled. Since the user terminals are unavailable while reports are being printed, manual reports cannot be initiated while ARG reports are being printed. However, should a manual report be in the process of printing when an ARG report is due, the ARG report will be printed when the manual report printing process ends.

Q.2 Reports Generated

Any combination (or all) of the following reports can be selected for any ARG hour:

(01) Traffic Summary
(02) Average Call Duration
(03) Chronological Detail
(04) Maintenance Detail
(05) Multi Line Detail
(06) Peg Count
(07) Busy Hour

Q.3 Report Destination and Duration

In software versions beginning with 1.352 and higher, the capability of the automatic report generator has been expanded to include additional output capability and variable report durations. Reports can now be directed to either COM1, COM2 or the printer. Report durations can be set independently from 1 to 24 hours for each ARG hour.

Q.4 Activation/Deactivation

An Automatic Report Generation hour is defined and activated by invoking the Set Automatic Report Generation (SARG) command:

```
=>SARG hh ON  r,r,...,r Ggg,Ggg,...,Ggg COM1 DUR
          OFF ALL       ALL             COM2
                                        PRN
```

hh = (0 - 23) Hour in which the reports are printed. Reports cover a user specified duration period ending at the end of the previous hour. For example, specifying a 0 report hour with a 24 hour duration will produce reports for the previous full day hours 0 - 23.

ON = ARG hour enabled.
OFF = ARG hour disabled.

r = Report acronym or number.
ALL = Create reports for all MIS Report types.

Ggg = Group name or number.
ALL = All lines enabled when the report is generated.
COM1,COM2,PRN = Select the desired I/O Port for the output report
DUR = Enter XX where XX= 01 to 24 hours for report duration.

ARG can also be enabled / disabled for a particular ARG hour by using the abbreviated SARG command (see below). This command will not alter the ARG hour's report block and line group definition.

```
=>SARG hh ON
          OFF
```

hh = (0 - 23) Hour in which the reports are printed
The reports cover a user specified duration period ending at the end of the previous hour. For example, specifying a 0 report hour with a 24 hour duration will produce reports for the previous full day, hours 0 - 23.

ON = ARG hour enabled.
OFF = ARG hour disabled.

APPENDIX R: SYSTEM SITE NAME

In software versions 1.37 and higher System Site Name capability has been added. This feature allows the craftsperson to provide a meaningful site name for the Line Logg-R installation. There is one administrable site name per Line Logg-R system.

The system site name is displayed in one of two ways:

1) In the header of any report created using the CRPT command.

2) By invoking the Display Site Name command at the terminal as follows:

   DSTE

The command to set the Line Logg-R's system site name is:

SSTE name

where name = 1 to 20 ASCII characters without spaces.

APPENDIX S: CLOCK CORRECTION FACTOR

In software versions 1.37 and higher, System CCF (Clock Correction Factor) capability is provided. The CCF is a administrable value, in seconds, that is used by the Line Logg-R to automatically adjust the system clock and provide accurate time of day.

The CCF can be set from -24 to 24 seconds. This is the number of seconds the clock will be adjusted in a 24 hour period. If the system clock is 10 seconds slow in a 24 hour period, the CCF should be set to -10. Conversely, if the system clock is 10 seconds fast in a 24 hour period, the CCF should be set to +10. This feature maintains time of day accuracy to +- 15 seconds per month.

The Clock Correction Factor is displayed using the following command:

DCCF

The command to set the Line Logg-R's system Clock Correction Factor is:

SCCF ss

where ss = -24 to +24 seconds.

APPENDIX T: SYSTEM SERIAL NUMBER

In software versions 1.37 and higher the system serial number can be obtained by the craftsperson via terminal command. This feature provides a convenient method to determine the Line Logg-R's serial number.

To display the Line Logg-R's serial number use the Display Version command:

DVER

APPENDIX U: SYSTEM I/O TEST

In software versions 1.37 and higher SIOT (**S**ystem **I**/**O** **T**est) capability has been added. This feature allows the craftsperson to easily execute a system test of the CPU, RAM, Hard drive, COM ports and printer port.

The SIOT command directs an ASCII text test message to all I/O ports in the Line Logg-R system, that is, COM 1, COM 2 and the printer. The identical test message should be displayed on all three devices, otherwise an I/O error has occurred. The system I/O test will also display the status of each I/O port and a PASSED or FAILED test result message on the initiating terminal. The following is the ASCII test message:

```
------------------------------------------------------------------------
*    `1234567890-=[];',./\~!@#$%^&*()_+{}:"<>?|                        *
*    abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ              *
*                                                                      *
*    The SIOT command tests the following PC functions of the Line     *
*    Logg-R 4911 system:                                               *
*                                                                      *
*        -   RAM read / write                                          *
*        -   Hard drive read / write                                   *
*        -   Communication ports 1 and 2                               *
*        -   Printer port                                              *
*                                                                      *
*    This message should be displayed on communication ports 1 and 2,  *
*    and on the printer.                                               *
*                                                                      *
------------------------------------------------------------------------
```

The system I/O test command is invoked by using the following:

SIOT

APPENDIX V: SET SYSTEM CONFIGURATION TO DEFAULT VALUES

In software versions 1.37 and higher the ability to reset system configuration database to default values has been added. This feature provides a convenient method to reset system configuration. The system configuration database items that are reset include threshold voltage, line types, line monitoring enable, line names, group names and numbers, automatic report generation, site name, system users and passwords. This command is especially useful in portable units used for troubleshooting problems in different locations.

The Set Default command is invoked by using the following:

SDEF

APPENDIX W: TONE POSITION IDENTIFIER

W.1 OVERVIEW

Position Identifier capability provides automatic PSAP position identification on a per call-handled basis to users of RAN Systems 4911 series Line Logg-R systems. The Position Identifier continuously monitors the status of the position handset and transmits a low level identification signal to the system, which then records the position number with the call record. Since the identification signal is monitored on the trunk (CO) side of the PSAP or ACD, identification is positively correlated with the incoming call without relying on external information, such as time.

Additionally, the Position Identifier identifies secondary pick-ups, which occur after the call has been put on hold, so that hold periods and internal transfers are accurately reported.

Model 4911-17 tone transmitter functions with most standard telephone sets, either analog or digital, whether they are key sets or extensions on a PBX, ACD or other type of switch. It is externally powered, using a plug in adapter supply and can be installed without the use of special tools.

W.2 SYSTEM CONFIGURATION

There are only two basic components needed for the Tone Position Identification capability, a Tone Position ID transmitter (option -17) at the PSAP and a Tone Position ID Receiver card (option -20) for each line terminating at the PSAP. The quantity of ID Transmitters is equal to the number of positions to be identified, and the number of ID Receivers is equal to the number of lines monitored. The transmitter is electrically compatible with all types of telephone sets and may require an adapter, depending on the handset connector used. There are two types of receivers. The type used depends on the type of line monitoring card installed in the Line Logg-R.

W.2.1 Position ID Tone Transmitter LMT 4911-17

The ID Transmitter is connected in series with the position handset cord, and sends a group of two dual-tone pairs each time the position handset is enabled, and at certain other times. The tone pairs consist of combinations of special frequencies which are selected so that they will not interfere with standard tone signaling on the lines (MF or DTMF).

The transmitter automatically senses the polarity and type of handset, and will work with all types. It is equipped with standard miniature 4 position RJ series female jacks and a short male-to-male adapter cord for insertion in series with telephone sets that utilize this type of handset cord. For telephone sets that use RJ-241 (dual PJ-055) connectors, handset adapter LMT 4911-31 is required. Two strapping options are required in the transmitter to accommodate various installation situations. See section W.8 for strapping details.

W.2.2 Position ID Receivers

The Position ID Receiver is installed within the LMT 4911 monitoring system, on the Line Monitor Card(S). One receiver is required for each line being monitored.

W.2.2.1 LMT 4911-20

This version is used with Standard Line Monitoring Card LMT 4911-01, where it plugs into the MF Receiver Module socket(s). The receiver can be strapped for either incoming 911 trunks (DID) or conventional trunks. Place the strap in position 1-2 for DID lines, and position 2-3 for loop start lines. From 1 to 4 receivers may be installed on a Standard Line Monitoring Card.

W.2.2.2 LMT 4911-26

This version is used with the Caller ID Monitor Card LMT 4911-06. It plugs directly into sockets provided for it on the card. Receivers may be installed in any order or sequence in the sockets for lines 1 to 8. No strapping is required.

W.3 SPECIFICATIONS

W.3.1 General

Transmitted Code

Type: 2 digit, special frequency tone pairs
Number: Up to 40 unique codes are settable by DIP switch

Transmission Sequence

Initial Transmission: 2 seconds after the telephone set goes off hook
Repeat Transmissions (selected by straps)
Mode 1: none
Mode 2: 5 seconds after initial transmission (time value is nominal)

Power

6 VDC from plug-in adapter which is accepted by any standard 115 VAC receptacle.

Size
2" x 1.5" x 4"

W.3.2 Transmitter

Connectors

Standard (Model 4911-17): Equipped with RJ-13 Handset connectors (2) for insertion in series with RJ type handsets

Adapter (Model 4911-31): Includes PL-241 adapter (PJ-55 male pair and female pair) for insertion in series with 310 jack type handsets

Strappable Functions

Transmit Level
- High
- Medium
- Low
- Very Low

Secondary Transmission
- None
- One

Size

4.5" x 2.5"x 1.25"

Power

6 VDC from plug-in adapter (150 mw)

W.3.3 Receiver

Connectors

Plugs into MF receiver socket of LMT-4911-01, LMT 4911-18 and LMT 4911- 06 line monitor cards

Functionality

Adds reception capability for Position Locator Transmitter LMT 4911-17. Does not interfere with installation or operation of LMT 4911-04 MF digit receiver.

Strappable Functions

Line Type
- DID 911 trunk
- Loop and Ground Start

W.4 POSITION ID TRANSMITTER CODES

Model LMT 4911-17 transmits a unique 2 digit code for each position. Digits are set by means of two DIP switches, S1 and S2. S2 is a four element switch used to set the first or tens digit of the position number from 0 to 4. S1 is a ten element switch used to set the last or units digit of the position number from 0 to 9. Thus the two digits together provide the means to identify position numbers from 01 to 40. Set these switches, located as shown in W.5, as follows:

SETTING THE POSITION SWITCHES

POS. #	SWITCH SETTING S2	S1
01	1	10
02		1
03		2
04		3
05		4
06		5
07		6
08		7
09		8
10		9

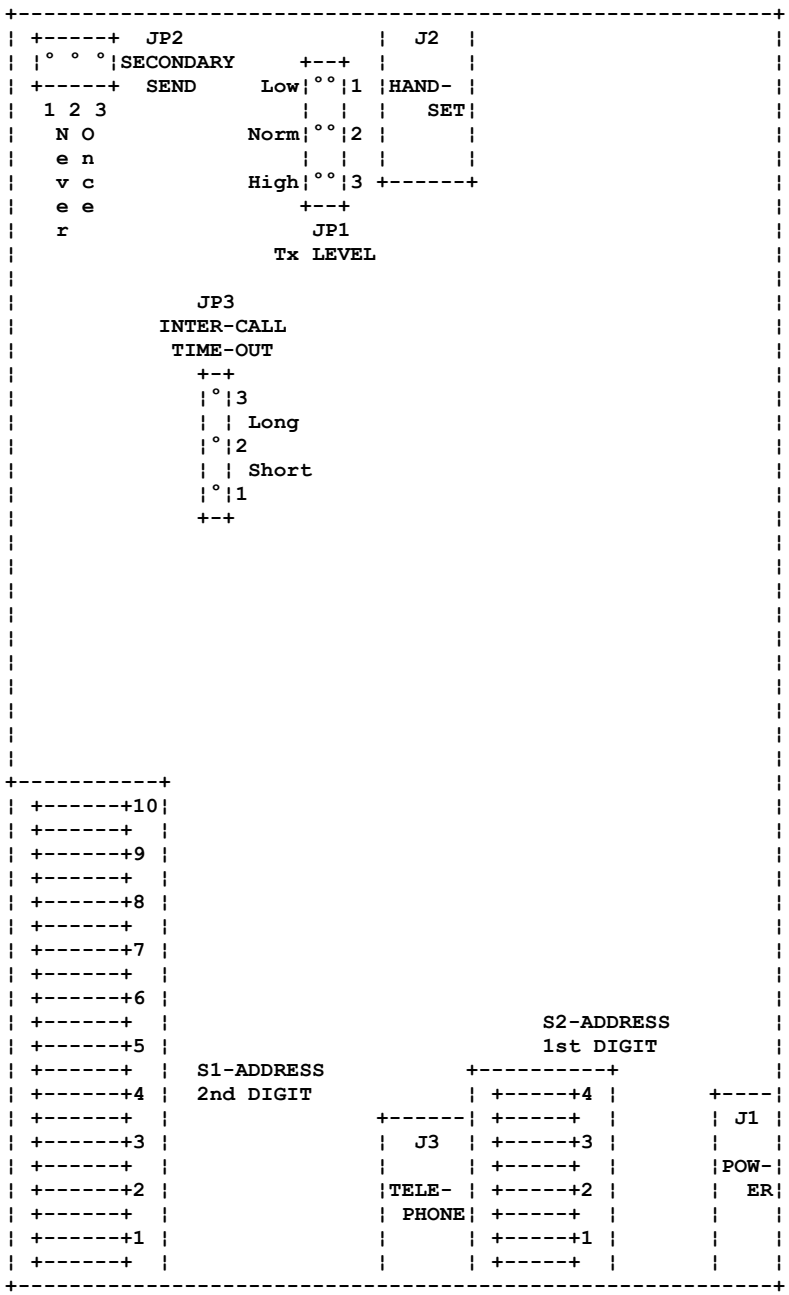
POS. #	SWITCH SETTING S2	S1
11	2	10
12		1
13		2
14		3
15		4
16		5
17		6
18		7
19		8
20		9

POS. #	SWITCH SETTING S2	S1
21	3	10
22		1
23		2
24		3
25		4
26		5
27		6
28		7
29		8
30		9

POS. #	SWITCH SETTING S2	S1
31	4	10
32		1
33		2
34		3
35		4
36		5
37		6
38		7
39		8
40		9

W.5 Transmitter DIP switch and strap locations

POSITION ID TRANSMITTER DIP/STRAPPING OPTION LOCATIONS



W.6 TRANSMITTER STRAPPING

The transmitter must be strapped at installation to agree with the type of set it is connected to, and to establish the desired transmission characteristics. Strapping information is as follows:

W.6.1 Repeat Transmit Mode

The Repeat Transmit Mode strap determines whether the transmitter will send the position ID code one or two times. Sometimes in noisy environments the initial tone transmission may be masked by ambient noise and thus be undecipherable by the receiver. In such environments, the repeat transmission option should be selected as shown in the following table. Otherwise the no repeat transmission option should be employed.

STRAP JP2 SETTING VS SECONDARY TRANSMIT MODE

MODE	FUNCTION	STRAP
1	No repeat transmissions	1-2
2	One repeat transmission	2-3

W.6.2 Transmit Level

Since the loss through the PSAP (or other equipment, if used) may widely vary, the transmit level must be set to one of four different levels via strap set JP1. If the PSAP is in very close proximity to the Line Logg-R, use the lowest output power level (i.e., no strap). Conversely if the PSAP is very remote from the Line-Logg-R, use the highest output power level (i.e., strap 3 to 3). It is generally suggested to initially use the Low-Low setting. If problems occur, such as missed transmissions, gradually increase the power level until optimum performance is achieved.

STRAP JP1 VS TRANSMIT LEVEL

TRANSMIT LEVEL	STRAP
Low-low	No strap
Low	1-1
Medium	2-2
High	3-3

W.6.3 Intercall Timeout

This option controls whether or not the position ID code is sent immediately after the the initiating station goes off-hook or is delayed a few seconds. A delay is often required when the initiating station must dial an access code e.g. 9, before seizing the dial line. In such cases the Position ID transmitter could send the code before the outgoing line is actually seized and thus would not be seen be the Position ID receiver. Strap JP3 1-2 when no delay is required or JP3 2-3 when a delay is desired.

APPENDIX X: CONTACT POSITION IDENTIFIER

X.1 DESCRIPTION

The Wired Position Identifier System relies on contact closure information to identify the times that each position goes off-hook/on-hook. These times are compared with the call event times to correlate calls with positions. The contacts are provided on the position hardware. Since other equipment may share the contacts, Position ID Contact Transmitters (option -27) are supplied. These isolate the equipment contacts, providing floating contacts to the Line Logg-R Position ID Monitor Card (option -23).

A Position ID Contact Transmitter senses the state of the contacts on the position hardware, and operates floating contacts in synchronism. These contacts are wired to the Line Logg-R, where they are sensed and entered into the database. The transmitter input and output are fully floating and are also isolated from each other. The input is high impedance and will not disturb any other equipment connected across the contacts.

A Position ID Monitor Card is a single card that installs in either the main or expansion chassis of the Line Logg-R. This card accepts 40 inputs on either an array of five 20 pin ribbon cables or a single 50 pin ribbon cable. The five connector array permits connection to an existing (unused) RJ-21 connector on the chassis, while the 50 pin cable is used to install an additional RJ-21 in situations where none are available.

X.2 INSTALLATION

X.2.1 System Installation

Wire as many position inputs to the 66 block as there are positions on the Position ID Monitor Card. The card appears to the Line Logg-R as two cards, each of which can be strapped to appear at any BANK and CARD. For normal installations, strap both cards for the lowest completely unused BANK available. Strap 'A' to CARD 1 and 'B' to CARD 2 (the card is shipped from the factory strapped for BANK 4, CARD 1 and CARD 2). This setting corresponds to lines 61 - 68. Each line enabled can monitor 5 positions. There are 8 lines on this card therefore a maximum of 40 positions may be monitored in a system.

Select a completely unused output connector, and connect the five cables from the backplane connector to the five connectors on the Position ID Monitor Card in numerical order. Thus, all 20 lines (X1 to X20) of the selected bank are available to be used for this function, and the position inputs will appear either on the selected connector on the rear of the Expansion Chassis (if there is one), or on the Main chassis. If there is no available free input connector, a special cable is available which provides an additional connector (consult factory).

If it is used in the Main Chassis, install the card in the last slot, and if an expansion chassis is used, install the card in slot 16. Install the 66 block and cable it to the selected connector.

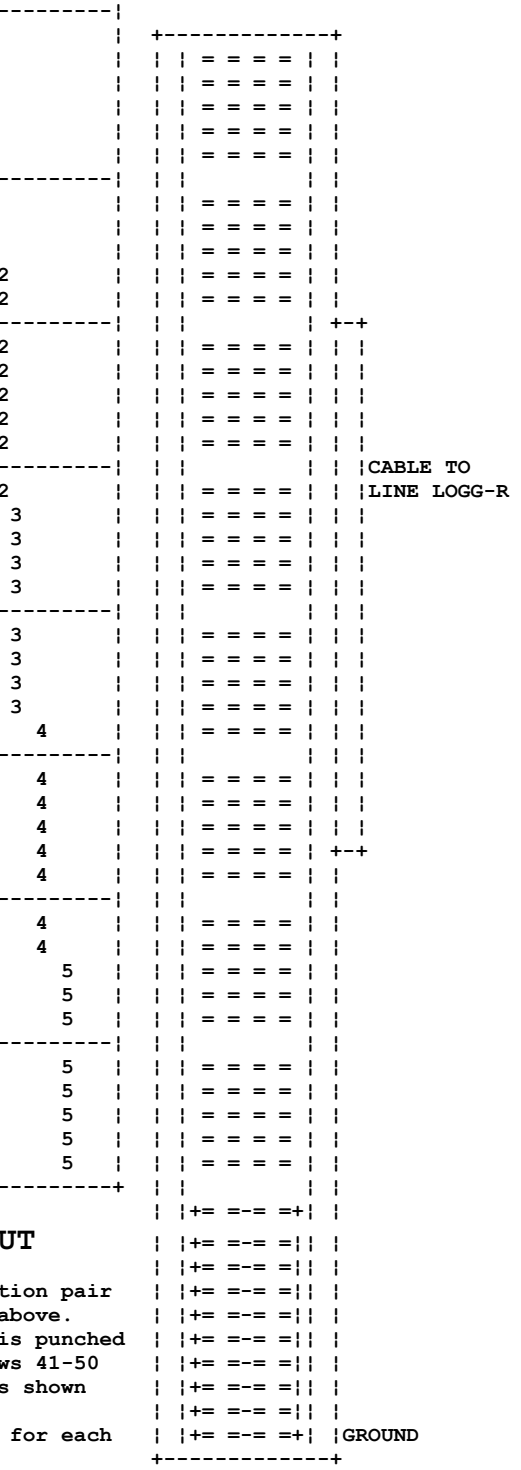
When the system is powered on, the software automatically recognizes the location of the card. Use the DHLV command to display the lines that were detected as POS-ID. Enable all the lines for the selected BANK. This activates monitoring for all 40 positions.

X.2.2 Connection of Existing Position Status Contacts

The Line Logg-R contact sensing inputs will not load existing voltages on contacts that are in use, and will also work with contacts that are not otherwise used.

Connect the input to the Position Transmitter across the relay contacts of the Operator Position, and connect the output of the Position Transmitter to the 66 block as indicated in the following figure. Connect the GROUND terminal of the 66 block to telco ground.

RING WIRE FROM POSITION #	INSTALL CABLE TO CONNECTOR #
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	2
10	2
11	2
12	2
13	2
14	2
15	2
16	2
17	3
18	3
19	3
20	3
21	3
22	3
23	3
24	3
25	4
26	4
27	4
28	4
29	4
30	4
31	4
32	4
33	5
34	5
35	5
36	5
37	5
38	5
39	5
40	5



POSITION 66 BLOCK PINOUT

NOTE: The RING wire of each position pair is punched down as shown above. The TIP wire of each pair is punched down to ground. Strap rows 41-50 of the block to GROUND as shown for this purpose. Place a strap across block for each active position.

X.3 CONTACT DRIVEN POSITION SENDER RELAY (LMT 4911-27)

This unit senses the state of the hook status relay contacts on the PSAP position, and operates the position sender relay accordingly. Since it will function in the presence of foreign voltage across the contacts it can be used in parallel with other devices that are connected across the contacts. The output contacts which drive the Line Logg-R are electrically isolated from the position contacts.

To install the unit, first connect the input across the hook status contacts, using the wires supplied with the unit. Connect the (-)input black wire to the ground contact, and the (+) input red wire to the other contact.

The position sender is then connected to the Line Logg-R position input block (usually a type 66) via a suitable cable. Each sender requires a pair. The RING wire is connected to the (-) output, and TIP wire to the (+). Any standard single pair or multi-pair inside wiring cable from 20 to 26 gauge may be used. Strip the wires 1/4 inch and insert into the holes in side of the housing until they reach the internal stop. Tighten the corresponding screws through the holes in the top of the housing.

Punch the other end of the wires down to the 66 block as described in the Contact Position Identifier Installation section of this appendix.

NOTE

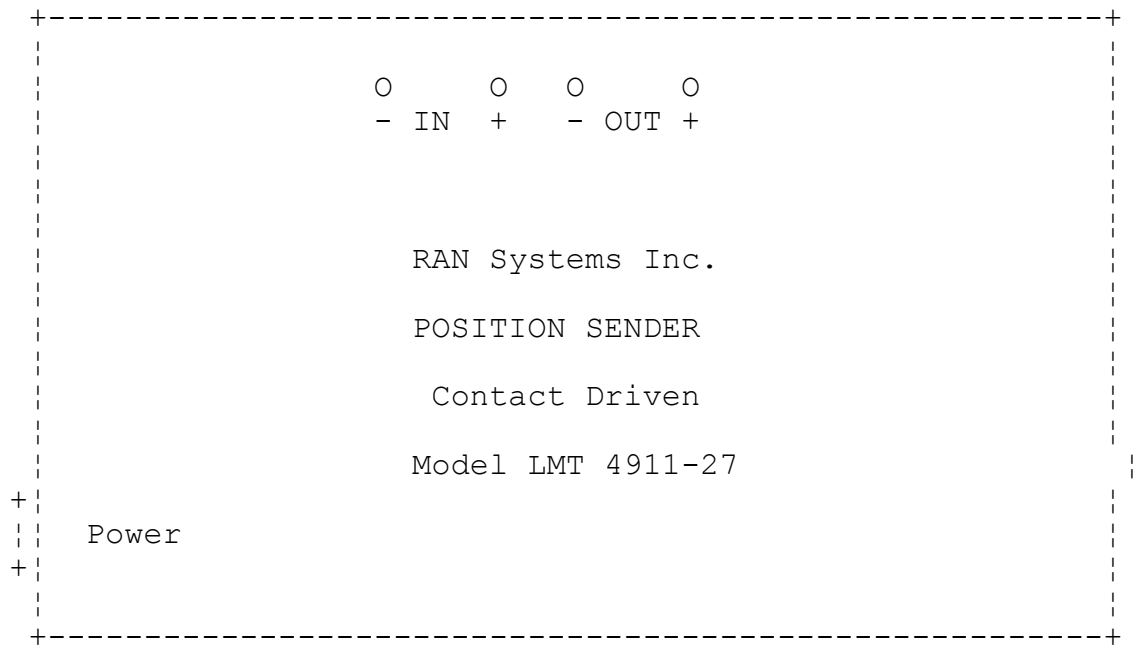
The punch-down pattern on the Contact Position 66 Block is **non-standard**. Be sure to read the manual before attempting to install.

Next, connect the power to the position sender, using the supplied plug-in adapter transformer. Verify the operation of the sender by taking the position off-hook and then replacing it. The relay should close and open, producing two audible clicks. If no clicks are heard move the input programming straps (inside) from the 'N' position to the 'R' position and retest.

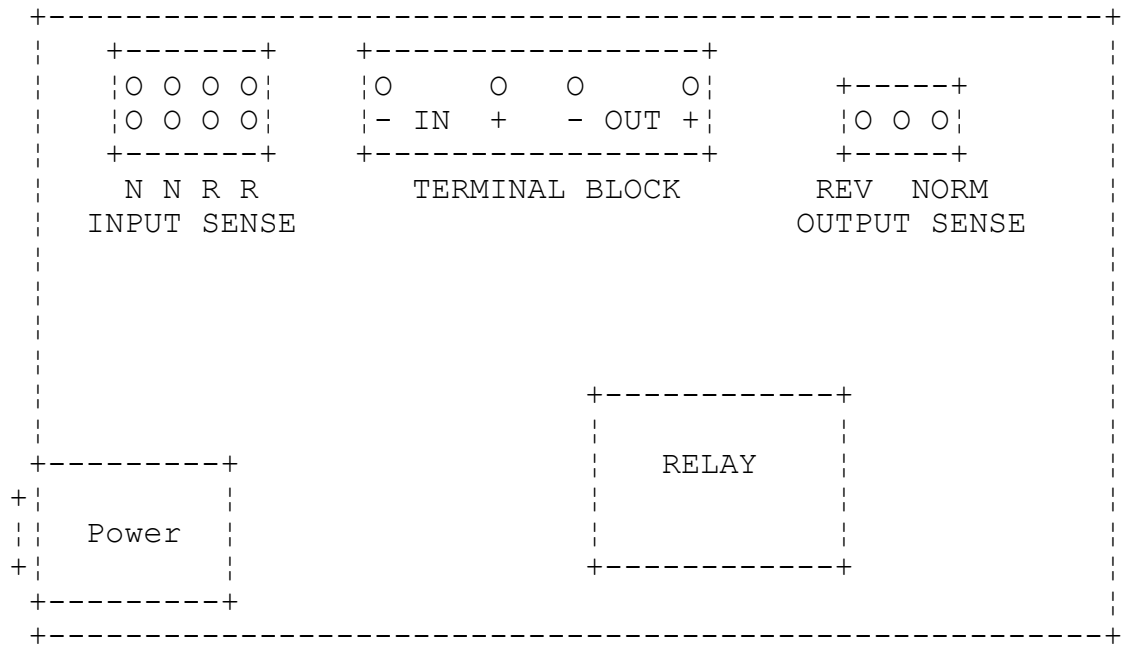
The wiring can then be verified by using one of the two following methods:

1. From the keyboard type DPOS (enter). This will continuously display the status of all positions in the Line Logg-R. When the hand set is On-hook there should be a "0" in that position's column. When the hand set is Off-hook there should be a "1" in that positions column. If the sequence is reversed move the OUTPUT SENSE programming strap from the NORM to the REV position and retest. Any position that is enabled but does not have a position connected to it, will display a "1". Any position that is disabled will show an "x". To exit the DPOS command hit the spacebar several times.

2. Measure across the pair at the 66 block. With the handset on hook, the voltage should be zero and should rise to 5 Volts when it goes off hook. If the sequence is reversed, move the OUTPUT SENSE programming strap from the NORM to the REV position and retest.



EXTERNAL VIEW



INTERNAL VIEW

X.4 HANDSET DRIVEN POSITION SENDER RELAY (LMT 4911-24)

This unit (option -24) senses the on-hook/off-hook status of the position handset, and operates the position sender relay accordingly. Since it automatically compensates for different handset voltages and polarities, there are no user adjustments or programming straps inside.

To install the unit, connect it in series with the handset cable via the two RJH series handset jacks on the side of the housing. The handset cable may be inserted into either connector, and the other connected to the telephone base or cabinet via the short cable supplied.

The sender is then connected to the Line Logg-R position input block (usually a type 66) via a suitable cable. Each sender requires a pair. The RING wire is connected to the N/C OUTPUT, and TIP wire to the COMMON. Any standard single pair or multi-pair inside wiring cable from 20 to 26 gauge may be used. Strip the wires 1/4 inch and insert into the holes in side of the housing opposite to the handset receptacles until they reach the internal stop. Tighten the corresponding screws through the holes in the top of the housing.

Punch the other end of the wires down to the 66 block as described in the Contact Position Identifier Installation section of this appendix.

NOTE

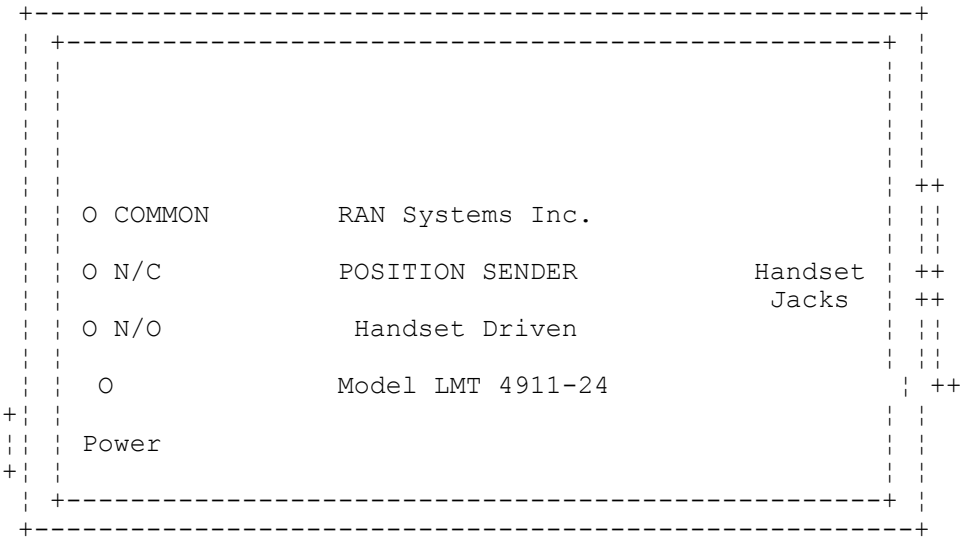
The punch-down pattern on the Contact Position Sensor 66 Block is non-standard. Be sure to read the manual before attempting to install.

Next, connect the power to the sender, using the supplied plug-in adapter transformer. Correct operation can be verified by observing the LED power indicator. The LED output should dim when the handset is taken off hook. This indicates that the sender relay is drawing power. If the sequence is reversed, move the RING lead to the N/O OUTPUT.

The wiring can then be verified by using one of the two following methods:

1. From the keyboard type DPOS (enter). This will continuously display the status of all positions in the Line Logg-R. When the hand set is On-hook there should be a "0" in that position's column. When the hand set is Off-hook there should be a "1" in that positions column. If the sequence is reversed move the OUTPUT SENSE programming strap from the NORM to the REV position and retest. Any position that is enabled but does not have a position connected to it, will display a "1". Any position that is disabled will show an "x". To exit the DPOS command hit the spacebar several times.

2. Measuring across the pair at the 66 block. With the handset on hook the voltage should be zero, and should rise to 5 Volts when it goes off hook.



APPENDIX Z: OUT-OF-SERVICE DETECTION

Z.1 GENERAL

In order to prevent extended out-of-service durations, automatic monitoring is performed on each E911 trunk. This monitoring is done continuously, evaluated periodically, and suspected trouble conditions reported automatically. This monitoring process establishes that each E911 trunk is functional up to the point of presence between the serving RBOC Central Office and the related PSAP.

Monitoring is only performed on E911 trunks with service evaluation done on an hourly basis. Each hour the data collected during the preceding hour is processed and evaluated for every E911 trunk. Under normal operation, each trunk in a given trunk group should experience uniform call traffic. Thus once sufficient call data has been collected, an inoperative or malfunctioning trunk can be readily identified by comparing its utilization relative to other members of the same trunk group. If any trunk in a group is detected as having no usage for a period of time, optionally established by the user, an output report is automatically generated and directed to the COM port specified by the SXDB command.

A call will be credited to a trunk each time the trunk experiences an off-hook, a wink and a on-hook in that specific sequence. Once adequate call data has been recorded and analyzed, the calls for the entire trunk group are sorted. Then the call rotation through the full trunk group is charted. Individual trunks will then be alarmed on the following basis:

- Trunk Inactive - During the most recent rotation of the trunk group, the trunk did not register a call.

- Trunk Out-of-Service - During the two most recent rotations of the trunk group, the trunk did not register any calls.

- Tip Fuse Blown - Trunk Inactive or Out-of-Service and determined to have no voltage on the tip conductor probably indicating a blown fuse.

- Ring Fuse Blown - Trunk Inactive or Out-of-Service and determined to have no voltage present on the ring conductor probably indicating a blown fuse.

The conditions listed above result in alarms being presented as follows:

NO ALARM - Normal activity, all trunks in all trunk groups are In-Service
CAUTION - Trunk Inactive during the most recent rotation
WARNING - Trunk Out-of-Service or possible blown fuse
FAILURE - Trunk group xx% Out-of-Service.

Z.2 OUT-OF-SERVICE DETECTION ADMINISTRATION

The following commands provide the user with the capability of setting, deleting and displaying OSD monitor groups:

- DOMX (See format at end of this appendix)	Display Out-of-Service Matrix
- DOSD	Display Out-of-Service Detection monitoring status by individual trunk groups
- SOSD Ggg,...,Ggg	Enable Out-of-Service Detection monitoring on trunk groups. Enter group number to enable monitoring gg = 01 to 16
- SDOS Ggg,...,Ggg	Disable Out-of-Service Detection monitoring on trunk groups gg,...,gg gg = 01 to 16
- DOGT	Display Out-of-Service threshold time for all trunk groups.

- SOGT Ggg,...,Ggg hh

  Set Out-of-Service threshold time for trunk groups gg,...,gg. Since Out-of-Service Detection Monitoring is triggered by comparing usage between different trunks in the same trunk group, if all trunks in a given trunk group have no registered usage in a given rotation, no problem detection process is initiated. However, this could potentially mask a major problem condition with the entire trunk group (i.e. cable failure). This command establishes threshold time, in hours, that the Out-of-Service Detection Monitoring process will wait, in the absence of any calls for an entire trunk group, before it initiates a test on each individual trunk in the trunk group.
  gg = 01 to 16
  hh = 0 threshold timing OFF
  hh = 1 to 6 hours

When the SOGT hh period has been reached with no calls registered for the trunk group, exception reports will be generated as follows:

```
09/08/1995  10:01:56  OUT OF SERVICE DETECTION       LL_OSD.022
WARNING:  NO CALL ACTIVITY FOR 4 HOURS - GROUP 03

09/08/1995  10:59:59  OUT OF SERVICE DETECTION       LL_OSD.021
WARNING:  INSUFFICIENT CALL DATA TO PERFORM OSD - GROUP 03
```

Z.3 DOMX OUTPUT REPORT MATRIX

```
SYSTEM MESSAGE:  Out-of-Service Detection active.

Reading call data from 09/18/1995:09
Reading call data from 09/18/1995:08
Reading call data from 09/18/1995:09
Reading call data from 09/18/1995:07
Reading call data from 09/18/1995:08
Reading call data from 09/18/1995:09

                  CALL ACTIVITY MATRIX
                  GROUP 2 (No Name)

                            |   I     I-1    I-2    I-3
--------------------------  |-----------------------------
 Line  9 No Name            |   C      C      C      C
 Line 10 No Name            |   C      C      C      C
 Line 11 No Name            |   C      C      C      C
 Line 12 No Name            |   C      C      C      C

                  CALL ACTIVITY MATRIX
                  GROUP 3 (No Name)

                            |   I     I-1    I-2    I-3
--------------------------  |-----------------------------
 Line 13 No Name            |   C      C      C      C
 Line 14 No Name            |   C      C      C      C
 Line 15 No Name            |   C      C      C      C
 Line 16 No Name            |   C      C      C      C

SYSTEM MESSAGE:  Out-of-Service Detection complete.

=>
```

Note that a "C" indicates that a call was registered during that particular interval(I). Any trunk that registered no calls in two or more of the most recent intervals, will cause an exception report to be generated and should be investigated.

APPENDIX AA: EXCEPTION REPORTING

AA.1 OVERVIEW

The Line Logg-R maintains a running log of all system failures, clock status and Out-of-Service conditions detected on E911 trunks. The Exception Reporting feature permits the user to access the information contained in this running event log for any specified period of time and to direct this output data to any desired COM port. The criteria for an event to be recorded in this running log is pre-established for internal system failures. However, E911 trunk Out-of-Service criteria is user definable as covered in APPENDIX Z of this manual. Output reports are automatically generated and directed to the specified COM port(s) on a per case basis for both system and E911 trunk suspected failures.

Three discrete exception logs are maintained within the Line Logg-R. These being:

1) System Exception Log(SYS). This log records system problems such as disk failures, memory allocation failures, CPU failures, etc.

2) Out-of-Service Detection Exception Log(OSD). This log records all suspected E911 trunk Out-of-Service conditions as covered in APPENDIX Z of this manual.

3) Clock (CLK). This logs status of master clock synchronization.

AA.2 Automatic Output Reports

An output report is automatically generated for each event as discussed above. These reports appear in the following formats:

```
09/15/1995 12:14:50  SYSTEM MEMORY MANAGEMENT      LL SYS.007
Memory allocation failure

09/18/1995 09:32:44  OUT-OF-SERVICE DETECTION      LL OSD.014
Group 50% Out-of-Service - Group 03 (E911 Group 00003)
```

AA.3 User Requested Output Reports

To display all or portions of an Exception Log, employ the DXLG (**D**isplay **E**xception **L**og) command as follows:

DXLG SYS m,...,m com,...,com
OSD
CLK

where:
m = 01 to 12, ALL where January = 01, Feb = 02, etc
com = COM1, COM2, PRN or ALL specifies the device to which the selected report is to be directed.

AA.4 Exception Log Database

To display an exception log's database settings, use the Display Exception Database (DXDB) command.

DXDB SYS
OSD
CLK

To activate or deactivate an exception log use the Set Exception Database (SXDB) command.

SXDB SYS m,...,m com,...,com
OSD
CLK

where:
m = 00 to 12 with January = 01, Feb = 02, etc and 00 = disable exception log.
Com = COM1, COM2, PRN, or ALL Specifies the device to which all automatically generated exception reports are to be directed.

APPENDIX AB: Pre-Processed Call Data

In Software versions 1.46 and higher, the Pre-Processed Call Data feature is equipped. The Pre-processing feature provides the following capabilities:

- Enables Line Logg-R unit to store 2 years of pre-processed call data in addition to 60 days of raw data. This 2 years of pre-processed call data can only be accessed by CRPT 5, DDIR PP, and the CARC PP commands, and the MIS Logg-R download process.
- When MIS Logg-R software downloads pre-processed call data, the downloading time is significantly decreased.
- This feature is automatically enabled at installation time. The default start date of capturing pre-processed calls is the date the software is installed. For example, Line Logg-R upgraded on 2/13/98 to 1.46b1. In the early AM hours of 2/14/98, the Line Logg-R unit will pre-process the raw data of 2/13/98 and save it to disk.
- Allows user to cancel any active user process with **Ctrl+X** key sequence.
- New Line Logg-R commands:

Syntax	Description
DCPP	**D**isplay **C**all **P**re-**P**rocessing setting.
SCPP OFF	**S**et **C**all **P**re-**P**rocessing **OFF**.
SCPP mm/dd/yy	**S**et **C**all **P**re-**P**rocessing ON and start with call data on **mm/dd/yy**.
SCPP ON	**S**et **C**all **P**re-**P**rocessing **ON** and use current date for first day's data.
DDIR PP	**D**isplay **DIR**ectory for **P**re-**P**rocessed call data.
CARC PP	**C**reate **ARC**hive of **P**re-**P**rocessed call data.
<Ctrl>X	Cancels all current active user processes.
DPOS	**D**isplay **POS**ition Identification status

The Line Logg-R can pre-process call data up to 4 days every morning. This allows the Line Logg-R to 'catch up' if the pre-process start date is set to a date, prior to the current date.

For example, today is 2/13/98. The SCPP 01/01/98 command was issued. Starting at 2am on 2/14/98 the Line Logg-R pre-processes calls for 1/1/98, 1/2/98, 1/3/98, and 1/4/98. On 2/15/98, calls for 1/5/98, 1/6/98, 1/7/98, and 1/8/98 are pre-processed. By 2/27/98 the Line Logg-R pre-processing call data will be current. On 2/28/98 calls for 2/27/98 are pre-processed

APPENDIX AC: ENHANCED ANI

In Line Logg-R software versions 1.48 and higher, EANI(Enhanced Automatic Number Identification) handling is provided. This feature increases the ANI fields in the Chronological, Maintenance and Multi-line Detailed reports to accommodate 10/20 digit ANI. The EANI feature is administrable on a system wide basis and can be activated / deactivated via user command.

Customers using the MIS Logg-R software will be required to purchase an upgrade to MIS Logg-R V1.20 or higher. This software will accurately store and report the increased ANI fields provided to the MIS Logg-R from the Line Logg-R download.

The Enhanced ANI feature status is displayed using the following command:

DANI

The command to set the Enhanced ANI feature is:

SANI ON
OFF