**5ESS® SWITCHING EQUIPMENT
REMOTE LINE GROUP
UNIT
CIRCUIT**

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1. GENERAL DESCRIPTION

The Remote Line Group (RLG) is an extension of the Integrated Services Line Unit model 2 (ISLU2) that provides line circuits at a remote site. The ISLU2/RLG host supplies data from a Line Interface Data Bus (LIDB) and control from a Remote Interface Control Bus (RICB), which is transported over a 2.048 MB/s transmission facility to the RLG-Remote unit at the remote site and reconstructed there as a LIDB and Peripheral Control And Data Bus (PCADB). The remote unit contains an ISLU2 line group, consisting of eight Line Packs (LPs) with eight line circuits per pack, for a total of sixty-four lines.

2. ARCHITECTURAL OVERVIEW

A simplified block diagram of the RLG-Remote unit is shown in *Figure 1*. The interface to the switch side of the unit consists of Transmission (TX) facility connections, a Metallic Test Bus (MTB), and ALarM (ALM) outputs, all of which appear at the duplicated Remote Line Group Interface-Remote (RLGI-R) boards. Each RLGI-R is associated with an Enhanced High-Level Service Circuit (EHLSC). The RLGI-Rs provide the interface to the Line Packs (LPs) over bus connections internal to the unit's backplane. Eight LPs provide Tip/Ring (T/R) connections for up to sixty-four subscriber lines. Sparing for one-line circuit is available through a Sparing PLuG (SPLG) option on the backplane.
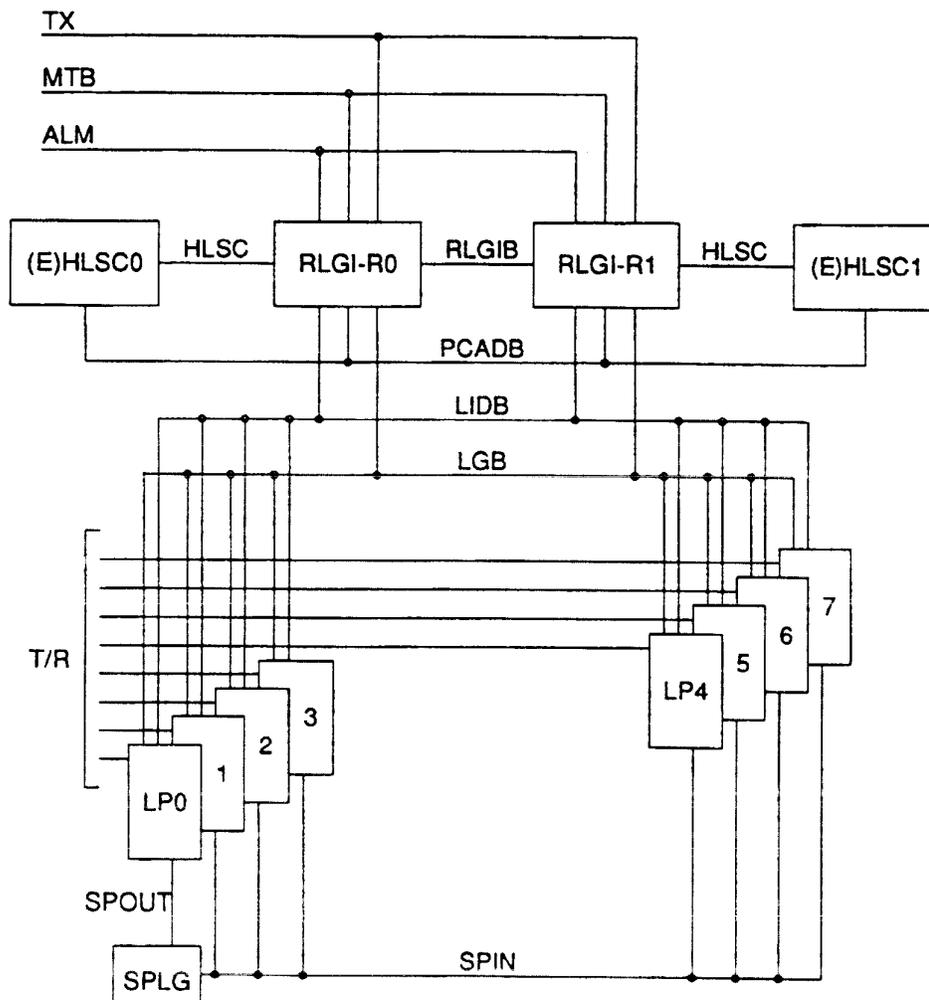

Figure 1. Remote Line Group-Remote Unit Block Diagram.

3. INTERNAL BUS ARCHITECTURE

Bus paths internal to the backplane connect the twelve circuit pack positions within the RLG-Remote unit.

The Remote Line Group Interface Bus (RLGIB) provides cross-connects between the two RLGI-R boards for testing and duplex operation.

Control information is passed from the RLGI-Rs to the EHLSCs via the PCADB , which carries control information in 2.048Mbps message bursts.

Subscriber data and line group control information is passed over the LIDB between the RLGI-R and LPs. The LIDB is a bidirectional 4.096Mbps serial time-multiplexed bus that is partitioned into thirty-two sixteen-bit time slots, transmitted at an 8 MHz frame rate.

The RLG-Remote metallic architecture supports metallic access to the T/R interface of line circuits and subscriber lines for testing, diagnostics, ringing, and/or sparing. Metallic T/R access is provided for external metallic test systems from the MTB, through the RLGI-R boards and to the LPs over the Line Group Bus (LGB). Metallic T/R paths also exist from the EHLSCs over the High-Level Service Circuit (HLSC) bus, then through the RLGI-Rs to the LPs over the LGB.

4. LINE GROUP ARCHITECTURE

As in the ISLU2, the RLG may be equipped with up to sixty-four line circuits. The line circuits are implemented on N-sized circuit packs. In the present design, each line card contains eight line circuits and associated power and control circuitry. All of the line circuits on a line pack are of the same type: U, T, or Z. LPs of different or similar type may be equipped in a line group in any combination and in any position sequence, with the exception of T/R cabling differences.

5. LINE CIRCUIT SPARING

One of the line circuits in LP0 can be made available as a spare by positioning the SPLG in the spare position on the unit backplane. This option connects the T/R leads of the Spare OUT (SPOUT) bus from LP0 to the SPare IN (SPIN) bus connections of the other seven LPs.

6. METALLIC SERVICE CAPABILITIES

Metallic services are supported by the EHLSC packs, which are general purpose test and ringing circuits that can be metallically connected to the T/R interface of a line circuit and/or subscriber loop. They are used to perform per-call tests on analog lines, Network Termination (NT) mismatch testing on U-interface Digital Subscriber Lines (U-DSLs), and line circuit and metallic network diagnostics. In some applications, it is also used to provide additional ringing capacity and special purpose ringing cadences.

The EHLSC supports Periodic Pulse Metering (PPM) and also provides special or overflow ringing in countries that use earth-backed ringing. It also supports all of the capabilities on the HLSC and provides earth-backed ringing capabilities for generating and measuring low-level 0-20kHz signals. The small signal capabilities will be used to support the testing of 12kHz and 16kHz PPM circuitry on Z-packs, and will also be used to control diagnostic access and source PPM test signals to the Fifty Hertz PPM Unit (FPPMU).

The type of EHLSC packs equipped in a unit will be engineered according to the different types of lines equipped. No EHLSC packs will be required in units equipped with only T line circuits, since T-packs have no metallic access.

The EHLSCs will be used to provide certain special purpose ringing functions, including non-standard frequency ringing, ring-lead ringing, and reverse battery ringing.

7. ACRONYMS

ALM	ALarM
EHLSC	Enhanced High-Level Service Circuit
FPPMU	Fifty Hertz PPM Unit
HLSC	High-Level Service Circuit
ISLU2	Integrated Services Line Unit model 2
kHz	KiloHertZ
LGB	Line Group Bus
LIDB	Line Interface Data Bus
LP	Line Pack
Mbps	MegaBits Per Second
MHz	MegaHertZ
MTB	Metallic Test Bus
NT	Network Termination
PCADB	Peripheral Control And Data Bus
PPM	Periodic Pulse Metering
RICB	Remote Interface Control Bus
RLG	Remote Line Group
RLGI-R	Remote Line Group Interface-Remote
RLGIB	Remote Line Group Interface Bus
SPIN	SPare IN
SPLG	Sparing PLuG
SPOUT	Spare OUT
T/R	Tip/Ring
TX	Transmission
U-DSL	U-interface Digital Subscriber Lines

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