5ESS SWITCHING EQUIPMENT
ACCESS INTERFACE UNIT
(AIU)

CONTENTS

1. GENERAL DESCRIPTION

The AIU (Access Interface Unit) is a single shelf, double high unit mounted in an SM-2000 or Classic Line Trunk Peripheral (LTP) cabinet. Up to 22 Circuit Packs (CP) may be housed in the unit. All common equipment is centralized on a single COMmon DAta and Control (COMDAC) CP, one for each of two service groups. All remaining CPs are Application Packs (AP). The unit employs two separate backplanes.

1.1 PURPOSE OF CIRCUIT

1.2 GENERAL DESCRIPTION OF OPERATION

The AP Backplane provides the interconnection of the two COMDACs and up to 20 APs, depending on equippage. Except for Ring Generator (RG) packs, these APs may be an arbitrarily mixed combination of Line Packs (LP) supporting analog (Z) interface, analog interface with 12/16 KHz PPM, and U.S. Coin Phone and multi-party/multi-frequency ringing. Ring Generator APs, when employed, will always be in pairs and take up the space otherwise used by APs 16-19. RG0 plugs into the AP 17 location, while RG1 plugs into the AP 19 location.

The Host Backplane provides interconnection between the Peripheral Interface Data Bus (PIDB)/Peripheral Interface Control Bus PICB cables and the COMDACs.

All cabling to the unit is managed from the front (component) side. Customer Lines connect via single cable and connector to each AP faceplate. Both backplanes have extensions to allow for cabling. The AP Backplane provides cable terminations for Power (-48V0, -48V1)/Altpwr/Ground (-48VRTN), Ringing (0, 1), Metallic Test Bus (MTB0, MTB1), and General Purpose Buses (0-2). Note that there are three additional General Purpose Buses (3-5) that are not accessible via cable. The Host Backplane provides the cable terminations for the PIDB/PICB cables.

1.3 DETAILED DESCRIPTION - COMDAC

Each AIU has two COMDACs operating in the active/active mode, each COMDAC serving half of the APs. There is a Data Interface and a Control Interface between each COMDAC and the APs.

The Data Interface consists of Clock (4.096 MHz), Frame Sync (8 KHz), PCM (Pulse Code Modulation) Data Up (to COMDAC), and PCM Data Down (to AP). The Data format is 32 Time Slots (TS) of 16 bits each, with 8 bits for PCM. The AP will select the TS to be used. The COMDAC is capable of connecting a given TS from any AP to the same TS on any of the PIDBs. The APs have the capability to connect any customer line to virtually any of the 32 TSs. The APs are capable of sending and receiving data to and from either COMDAC on any of the 32 TSs.

The Control Interface consists of Control Up (to COMDAC) and Control Down (to AP), both via 256K bit UART, Select, and Reset. The AP selects its control input based on the state of the Select inputs from the COMDACs. If the inputs are 00 or 11, then the AP listens to COMDAC 0; if 01 or 10, the AP listens to COMDAC 1. The control input not selected is looped back, unchanged, to the COMDAC.

COMDAC 0 and COMDAC 1 are powered off the -48V0 and -48V1 Buses, respectively; and connect to MTB0 and MTB1, respectively. Both COMDACs have access to both ringing buses and all six General Purpose Buses (0-5).

1.4 DETAILED DESCRIPTION - APPLICATION PACKS

1.4.1 Power Distribution

Power is distributed as follows: APs 0,1,4,5,8,9,12,13,16,17 are powered off of the -48V0 bus, while APs 2,3,6,7,10,11,14,15,18,19 are powered off of the -48V1 bus. The Z Line Packs, at a minimum, provide the BORSCHT functions for analog subscriber lines. The BORSCHT functions are Battery Feed, Overvoltage Protection, Ringing Access and Ring Trip, Supervision, CODEC (A-to-D and D-to-A conversion), Hybrid

(4-wire to 2-Wire conversion), and Loop Testing. The APs have access to both ringing buses as well as all six general purpose buses. Note that general purpose buses 0 and 1 are reversed for all odd-numbered APs. All APs employ the use of an 80C32 Microcontroller Complex and an AP-specific Z Access Controller device (ZAC). Brief descriptions of specific Application Packs follow.

1.4.2 POTS 32-Line Z AP

Programmable Line Card with the following per-line analog functions: DC Feed Profile, DC Current Limit, Detection Limit, Ring Lead, and software controlled Balnet, A-LAW/u-LAW, Termination, and Gain. This AP has test-in and test-out capability.

1.4.3 NP POTS 32-Line Z AP

Non-Programmable Line Card with the following per-line analog functions: Complex Balnet and Termination, A-LAW/u-LAW, 0 dB Gain, DC Current Limit (active and scan states), and detection limits for Switch Hook, Ring Trip, and Line Fault. This AP has only test-out capability.

1.4.4 PPM Z AP

This AP supports 24 lines and provides the following per-line programmable analog functions: Balnet, A-LAW/u-LAW, Termination, I-Limit, DC Feed Profile, Gain, Detection Limit, and PPM Frequency and Voltage.

1.4.5 Example of a Third Level Heading

US Coin 16-Line Z AP

This AP supports 16 subscriber interface circuits with required analog functions performed on a per-line basis. One Coin Function Power Supply and 16 Access Relays provide the signaling interface to the coin phone. Per line ground detectors are used for switch-hook detection and coin disposal relay operation.

1.4.6 Ring Generator AP

This AP provides the AC voltage necessary to ring subscriber station sets. RG0 connects to Ringing Bus 0, while RG1 connects to Ringing Bus 1. The RG supports commands to set/read the operating voltage, frequency, and bias settings.

1.5 SUBTITLES FOR HOW THE CIRCUIT OPERATES, FEATURES, FUNCTIONS, ETC.

1.5.1 Example of a Third Level Heading

2. REFERENCE DATA

2.1 WORKING LIMITS

2.2 FUNCTIONAL DESIGNATIONS

2.3 FUNCTIONS

2.4 CONNECTING CIRCUITS

2.5 MANUFACTURING TESTING REQUIREMENTS

2.6 ALARM INFORMATION

2.7 TAKING EQUIPMENT OUT OF SERVICE

3. REASONS FOR REISSUE

Not Applicable.

4. ACRONYMS, ABBREVIATIONS OR INITIALISMS

Lucent Technologies

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