



SLC[®] Series 5 Carrier System

**MC97776A1() (RT) Bank Control Unit—
5SPQ10R (MC97776A1)
5SPQABT (MC97776A1B)
5SCTEDL (MC97776A1D)
5SCTLLL (MC97776A1E)**

Features/Functions

- The bank control unit and alarm display unit together form the system bank controller
- Works with ADU to provide system options and system identification
- Has system program memory and EEPROM memory to store channel unit provisioning coefficients
- Controls drop and channel unit testing by the switch or PGTC
- Conducts internal performance monitoring and fault diagnosis
- System alarm LEDs.

Description

This data sheet describes the MC97776A1() remote terminal (RT) bank control unit (BCU) (COMCODE 106443427, MC97776A1; 106972482, MC97776A1B; 108287764, MC97776A1D; and 108669540, MC97776A1E) and is intended for the end-user of the unit. The MC97776A1C BCU number has never been assigned.

The MC97776A1() RT bank control unit is used in the SLC[®] Series 5 Carrier System remote terminal for TR-08* and SLC[®] Series 5 Feature Package C (FPC) applications. The MC97776A1() BCU is designed for applications where the RT connects directly to a TR-08 local digital switch (LDS), such as the 5ESS[®] switch with an integrated digital carrier unit (IDCU) or digital carrier line unit (DCLU).

The MC97776A1() BCU also supports connectivity to the *SLC 96*[®] Carrier System central office terminal (COT), *SLC-2000* Access System COT and *SLC* Series 5 Carrier System FPC COT. For details, see the *SLC* Series 5 Carrier System Application and Planning Guide, 363-205-010.

The MC97776A1() BCU together with the AUB27() alarm display unit (ADU) form the bank controller for the TR-08* or FPC RT in a *SLC* Series 5 Carrier System.

The BCU contains a microcomputer that provides central control functionality to the RT. It also has system program memory, electrically erasable programmable read-only memory (EEPROM) for semipermanent storage of channel unit provisioning coefficients, and random access memory. The RT communicates with the COT or switch over a data link embedded in the A digroup. The BCU controls this data link to exchange system alarms, and circuit test information between central office and the RT.

The BCU controls the framing format. In TR-08 applications the Fs format with D1D channel counting is used. In FPC applications the system operates with the extended super frame (ESF) (Fe) format with D4 counting. When the AUB27() ADU is optioned for automatic cutover, the BCU sets the framing format depending on the received line format. This permits automatic cutover from an FPC configuration to a TR-08 configuration and vice versa.

The MC97776A1E BCU has been designed to replace discontinued older-technology components. The MC97776A1E BCU is backward compatible with the MC97776A1 BCU, MC97776A1B BCU and the MC97776A1D BCU in all applications. The MC97776A1D BCU and MC97776A1E BCU supports the telemetry output feature of the AUB27() ADU. The MC97776A1D BCU and MC97776A1E BCU support telemetry output capability for major, minor, and power minor alarms, in place of miscellaneous alarm inputs, when the AUB27() ADU DL/NDL option switch is placed in the NDL position. When in the DL position, normal miscellaneous alarm transmission to the central office is provided via the TR-08 or FPC datalink.

In addition the MC97776A1B BCU, MC97776A1D BCU and MC97776A1E BCU provide the following features:

- Door alarm on white system of a dual bank is uniquely reported to the central office
- Improved handling of door alarm and power alarms for single bank applications

* Telcordia Technologies Technical Reference TR-TSY-000008 Issue 2, August 1987, and all Revisions and Supplements, *Digital Interface Between the SLC[®] 96 Digital Loop Carrier System and a Local Digital Switch*.

- Support of universal BRITE II ISDN capability in an FPC and FPC/AC configuration
- When used with an AUA105B TRU, supports hitless routine metallic drop testing by the Teradyne 4TEL* RMU in conjunction with the AUA176 line translator (LTT) and ED7C719-30 line fan-out (LTF) units.

Figure 1 shows the faceplate diagram for the MC97776A1E RT bank control unit. Table 1 lists the compatibility of the MC97776A1() BCU with various COTs and local digital switches. Table 2 shows the MC97776A1() BCU common unit compatibility. Table 3 lists the environmental specifications. Table 4 lists the power drain requirements. Table 5 lists the alarm responses for MC97776A1B BCU, MC97776A1D BCU and MC97776A1E BCU in FPB Mode and Table 6 lists the edge connections for the MC97776A1() BCU.

* Registered trademark of Teradyne Corporation.

Compatibility

The MC97776A1() RT bank control unit is compatible with a TR-08 local digital switch (LDS), such as the 5ESS switch SM or SM-2000 with an integrated digital carrier unit (IDCU) or digital carrier line unit (DCLU), SLC Series 5 FPC COT, SLC[®]96 TR-08 Mode 1 and Mode 2 COT, and SLC[®]-2000 COT Release R3.3. In a SLC Series 5 RT, the MC97776A1() RT BCU is compatible with the common units shown in Table 2.

Table 1. MC97776A1() BCU COT and Local Digital Switch Compatibility

MC97776A1() BCU Local Digital Compatibility* Interfaces			
Manufacturer	Model	Generic/ Release	Applications
Lucent Technologies	5ESS	5E1.2.2 and later	TR-08
	SLC 96 COT	NA	TR-08
	SLC Series 5 FPC COT	NA	FPC
	SLC-2000 COT	R3.3	TR-08

* See 363-205-010, *SLC Series 5 Carrier System Applications and Planning Guide*.

Compatibility

Table 2 is a FPB/FPC common unit compatibility matrix.

Table 2. FPB/FPC - Common Unit Compatibility

FPB/FPC - Autocut Applications										
Service	BCUs		ADUs			TRUs				LIUs
Configurations (Notes 1 and 2)	MC97776A1	MC97776A1B MC97776A1D MC97776A1E Universal BRITE II	AUB 24	AUB 26	AUB 27()	AUA 21	AUA 22	AUA 109	AUA 105()	AUA61() AUA62() AUA64()
FPB Without Provisionable Specials:										
FPB/U/M1	✓	✓	✓		✓		✓	✓	✓	Any Series
FPB/U/M2	✓	✓	✓		✓				✓	D Series
FPB/I/M1	✓	✓	✓		✓		✓	✓	✓	Any Series
FPB/I/M2	✓	✓	✓		✓				✓	D Series
FPB With Provisionable Specials:										
FPB/SS/U/M1	✓	✓			✓		✓	✓	✓	Any Series
FPB/SS/U/M2	✓	✓			✓				✓	D Series
FPB/SS/I/M1	✓	✓			✓		✓	✓	✓	Any Series
FPB/SS/I/M2	✓	✓			✓				✓	D Series
FPC & FPC With Autocut (Notes 3 and 4)										
FPC/AC	✓	✓			✓			✓	✓	C or D Series
FPC	✓	✓		✓		✓				Any Series
Notes:										
1. Where more than one unit is checked for a particular configuration, any of the units checked may be used.										
2. In all cases, Mode 2 capability can be converted to Mode 1 by changing ADU option setting and adding two LIUs.										
3. The MC97776A1B, MC97776A1D or MC97776A1E BCU is required to support BRITE services in FPC or FPC/AC. The MC97776A1() BCU does not support the DCU and therefore the MC97756A1 BCU is required.										
4. FPC/AC automatically cuts to FPB/SS/M1. By initially selecting D LIUs and AUA105B TRU, the RT will be equipped for later conversion to a Mode 2 configuration.										
Legend: ADU — Alarm Display Unit; BCU — Bank Control Unit; LIU — Line Interface Unit; TRU — Transmit/Receive Unit; FPB — Feature Package B;										
FPC/AC — Feature Package C-AutoCut; I — Integrated; U — Universal; SS — Special Services (Provisionable); M1— TR-08 Mode 1; M2— TR-08 Mode 2										

Specifications

This unit is intended for use in *SLC Series 5 Systems* located in controlled environments that conform to the specifications of Telcordia Technologies GR-63*. It may also be used in applicable Lucent Technologies cabinets designed for *SLC Series 5 System* and intended for applications in non-controlled (outside plant) environments that conform to Telcordia Technologies GR-487†. These cabinets, when properly equipped, are designed to maintain internal environmental conditions within appropriate operational limits for *SLC Series 5* equipment such that system performance meets TR-NWT-000057‡.

The applicable outside plant environment criteria for cabinet enclosures (per GR-487) are summarized in Table 3 Environmental Specifications.

Table 3. Environmental Specifications

<p>A. Temperature Range (Ambient)</p> <ol style="list-style-type: none"> 1. Operating, per TR-NWT-000057: in Lucent Technologies cabinets exposed to ambient temperatures of -40° F (-40° C) with no solar load to +115° F (46° C) with maximum solar load and maximum power dissipation. Lucent Technologies cabinets are designed to ensure that the components within do not exceed their rated temperatures for the above conditions. 2. Storage, per TR-NWT-000057: ambient temperatures of -40° to 140° F (-40° to 60° C).
<p>B. Relative Humidity</p> <ol style="list-style-type: none"> 1. Operating, per TR-NWT-000057. For outside ambient temperature 84° F (29° C) or less, relative humidity of 5% to 95%. For ambient temperatures above 84° F (29° C), the relative humidity is limited to that corresponding to a specific humidity of 0.024 pound of water per pound of dry air. 2. Storage, per TR-NWT-000057: ambient temperatures 84° F (29° C) or less, 10% to 95%. For ambient temperatures above 84° F (29° C), the relative humidity is limited to that corresponding to a specific humidity of 0.024 pound of water per pound of dry air.

* Telcordia Technologies Generic Reference GR-63, Issue 1, October 1994, and all Revisions and Supplements, "Network Equipment-Building System Requirements: Physical Protection (a module of LSSGR, GR-64; TSGR, FR-440, and NEBS FR, FR-2063)," Telcordia Technologies, Inc.

† Telcordia Technologies General Requirements GR-487, Issue 1, June 1996, and all Revisions and Supplements. *General Requirements for Electronic Equipment Cabinets*, Telcordia Technologies, Inc.

‡ Telcordia Technologies Technical Reference TR-NWT-000057, Issue 2, January 1993, and all Revisions and Supplements, *Functional Criteria For Digital Loop Carrier Systems*, Telcordia Technologies, Inc.

Table 4. Power drain for MC9776A1() BCU

Supply	Maximum Value
+5 Volts DC	5 W

Faceplate Features

The MC9776A1() RT bank control unit faceplate is shown in Figure 1. The following LED indicators are located on the faceplate:

FAIL (Red LED): When lit indicates that a failure has been sectionalized to the BCU. This LED will light momentarily during BCU installation or resets.

PMN (Yellow LED): When lit indicates a failure in the AC power plant or a AC input failure at the RT site.

MISC1 (Yellow LED): When lit indicates that RTMISC1 input closure at the RT has been activated.*

MISC2 (Yellow LED): When lit indicates that RTMISC2 input closure at the RT has been activated (FPC only).*

A (Red LED): When lit indicates that an incoming failure has occurred on the A DS1 facility.

B (Red LED): When lit indicates that an incoming failure has occurred on the B DS1 facility.

C (Red LED): When lit indicates that an incoming failure has occurred on the C DS1 facility.

D (Red LED): When lit indicates that an incoming failure has occurred on the D DS1 facility.



NOTE:

If you lose communications completely, such as when the A data link fails, then all LEDs A, B, C, and D could be lit. Loss of 20 Hz ringing power will also result in the A and B LEDs being lit with an associated major alarm.

* For the MC9776A1D BCU or MC9776A1E BCU; If the ND Mode is selected on the AUB27() ADU the MISC1 and MISC2 inputs are converted to MJ, MN and PMN outputs and the MISC1 and MISC2 indicators are unused.

For FPB applications, the LED indications on the faceplate of the BCU provide the following functions:

PMN (Yellow LED): When lit and with the BCU placed in a lower blue bank, indicates a failure in the AC power plant or a AC input failure at the RT site. When the MC97776A1 BCU is placed in an upper white bank, this LED indicates the same AC failure as does the BCU in the lower bank. See Table 6 below for MC97776A1B, MC97776A1D and MC97776A1E BCU alarm responses.

MISC1 (Yellow LED): When lit indicates that RTMISC1 input closure at the RT has been activated. When the BCU is placed in the lower blue bank, this LED is accompanied by the MN and NE LEDs on the ADU and an MN alarm data link message is transmitted to the CO. This feature may be used in single bank applications*. When the BCU is placed in the upper white bank, this LED is accompanied by the NE LED on the ADU and a P/M data link message is transmitted to the CO. See Table 6 below for MC97776A1B, MC97776A1D and MC97776A1E BCU alarm responses.

MISC2 (Yellow LED): This LED is not used in FPB applications. Any active signals on the RTMISC2 input will be ignored.

Table 5. MC97776A1B, MC97776A1D & MC97776A1E BCU Alarm Responses in FPB Mode

MC97776A1B, MC97776A1D & MC97776A1E BCU Alarm Responses in FPB Mode				
Bank	Event	Input Lead Used	BCU/ADU LEDs	Data Link Alarms
Blue	AC loss	Internal	PMN, NE	P/M
Blue	Door	MISC1	MISC1, MN, NE	MN
White	Door	MISC1	MISC1, NE	P/M
White	AC loss	None	None	None

The performance of the MC97776A1B BCU, MC97776A1D and MC97776A1E BCU has been enhanced by removal of the P/M alarm from the data link when the BCU is located in the upper white bank, in response to a loss of AC power serving both banks. This redundant alarm, if retained, would mask the door alarm for the white bank, which sends P/M over the data link.

* For single bank applications, the door alarm may be wired to the RTMISC1 input of the lower blue bank. When activated, this condition will cause the MISC1, MN, NE indicators to light in the BCU/ADU pair, and an MN alarm to be transmitted to the CO over the TR-08 data link. Existing installations of a single bank that transmit a door alarm using the open battery alarm associated with the power shelf are not affected. No action is required to retain this alarm feature upon replacement of an existing BCU with the MC97776A1B I1:1, MC97776A1D I1:1 and MC97776A1E I1:1 BCUs.

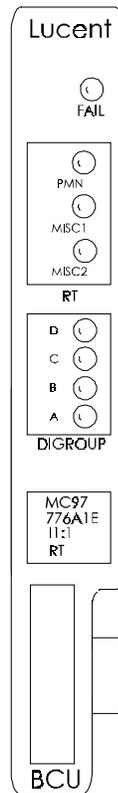


Figure 1. MC9776A1E Faceplate Diagram

Table 6. Edge Connections For MC9776A1() Bank Control Unit

Finger	Function
1	Frame Ground
18, 50, 60, 87	Circuit Ground
20	+ 5 Volts DC

References

The following documents provide additional information about the use of this unit in the *SLC Series 5 Carrier System*:

363-099-105TD	<i>SLC Series 5 Carrier System Integrated Network Access - Remote Terminal</i>
363-205-010	<i>SLC Series 5 Carrier System Application and Planning Guide</i>
363-205-401	<i>SLC Series 5 Carrier System Remote Terminal - Acceptance and Turnup</i>
363-205-402	<i>SLC Series 5 Carrier System Channel Unit Installation and Testing</i>
363-205-500	<i>SLC Series 5 Carrier System Maintenance and Trouble Clearing</i>
915-710-115	<i>SLC Series 5 Carrier System Application Engineering</i>

Technical Assistance

Follow local procedures for obtaining technical assistance. Lucent Technologies also provides in-hours or emergency out-of-hours help for the *SLC Series 5 Carrier System*. Call the Lucent Technologies Regional Technical Assistance Center at 1-800-225-RTAC.

Ordering Information

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Comments

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