Secondary E1 Unit (3608-85)

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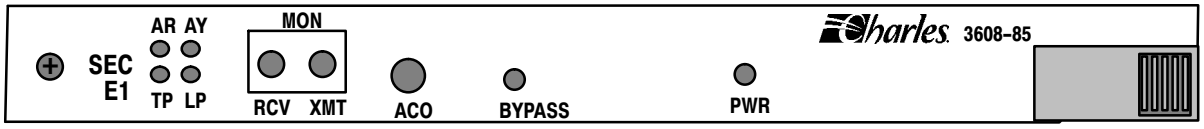


Figure 1. 3608-85 E1 Secondary Unit Front Panel

1. GENERAL

1.1 Document Purpose

This document provides general, installation and testing information for the Secondary E1 Unit (SE1U), shown in Figure 1. This document covers model number 3608-85.

1.2 Equipment Function

The SE1U is part of the 360-80 Intelligent Channel Bank (ICB). It combines the functions of a line interface unit (LIU) and a channel service unit (CSU), allowing direct connections to public E1 networks. The SE1U is a secondary E1 unit for the ICB, providing drop and re-insert (D&RI) operation when used with a E1 control unit (E1−S).

1.3 Equipment Location/Mounting

Mount the SE1U in the secondary (half-size) slot of the 360-80. One E1-S controller unit must be installed in the primary slot for proper system operation.

1.4 Equipment Features

This unit provides the following features:

- Downstream data blocking or broadcast for dropped timeslots.
- Drop and Re-insert operation with bypass.
- Front panel status LEDs.
- Front panel E1 monitor jacks.
- Time slot assignment on a per-channel basis.
- Auto framing and identification (Conventional CAS or CRC4 CAS).
- HBD3 line code.
- Hot unit insertion or extraction.
- Up to 60-channel E1 multiplexing operation.
- Temperature hardened (−40 to +65 C).
- Combines the functions of a LIU and a CSU, allowing direct connections to public E1 networks.
- Perform local loopback & performance monitoring of the E1 interface.
- UL/CSA listed and FCC verified.
- Meets Bellcore 1089, TR−57, ITU−T G.703, G.704 and Q.421 standards for E1.

1.5 Performance History

This unit stores performance history for the last 30 days in 24-hour intervals and over the last 24 hours in 15-minute intervals. This performance history includes failed seconds, errored seconds and severely errored seconds (per T1M1.3/93-00). The current 15-minute interval can be reset or the current 24-hour interval can be reset. When the current 24-hour interval is reset all 15-minute intervals within those 24 hours are reset.

1.6 Control Interface

This unit is managed through the craft port, the Network Management Software (NMS), or an SNMP Network Node Manager (NNM) that controls the provisioning of the unit and obtains status information from the unit. Provisioning is described in the Optioning section of this document. For operation, see the craft port, NMS or NNM documentation.

This unit will maintain its default provisioning until that provisioning is altered through the control interface. If this unit's provisioning is changed, it will maintain the new provisioning even if power is lost. If replaced with a new unit, the new unit will default to the same provisioning as was set for the prior unit. If this unit is installed in a loca-

tion that was used by a different type of unit, such as a 6-channel half size card, this unit will use its own default provisioning.

1.7 Status Indicators

This unit is able to provide a variety of status information. The following is a list of all status information available from the SE1U. Some status information is also provided through front panel LEDs. See individual channel units for additional status information.

- Red (AR) Alarm Status (LED)
- Yellow (AY) Alarm Status (LED)
- Loss of frame (LOF) Alarm Status
- Loss of signal (LOS) Alarm Status
- Power status (LED)
- E1 framing selected
- Line code
- Trunk processing (TP) status (LED)
- E1 loopback selected (LED)
- E1 bypass active LED

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

2.3 Static Concerns

Each unit is shipped in static-protective packaging to prevent damages from electrostatic charges. Use approved static-preventive measures, such as static-conductive wrist straps and a static-dissipative mat, when handling units outside of their protective packaging. A unit intended for future use should be tested as soon as possible and returned to its original protective packaging for storage.

STATIC-SENSITIVE

This equipment contains static-sensitive electronic devices. To prevent electrostatic charges from damaging static-sensitive units:

- **Use approved static-preventive measures (such as static-conductive wrist straps and static-dissipative mats) at all times whenever touching units outside of their original, shipped, protective packaging.**
- **Do not ship or store units near strong electrostatic, electromagnetic, or magnetic fields.**
- **Always use the original static-protective packaging for shipping or storage. Return a tested unit to its original protective packaging for storage.**

3. APPLICATION GUIDELINES

The SE1U is used only in the 360-80 ICB. Using the 3608-80 SE1U in any other Charles product will cause improper operation and could damage the equipment.

Note: When using HDSL modules for E1 transport, you may experience some problems with communication using the E1 facility data link (embedded operations channel) due to the E1 to DSL conversion/synchronization process.

3.1 Drop and Re-Insert Applications

"Drop and Re-insert" allows the E1 from the E1-S to be connected via the SE1U to a channel bank from the network (west) and the E1 from the SE1U to be connected to a channel bank toward a remote (east) location. The data/voice on the Primary E1 (which is connected through the SE1U to the E1-S) can be "dropped" to any one of the cards in the 360-80. Any data/voice that is not "dropped" to a card in the 360-80 can be re-inserted into the E1 from the SE1U and sent to the remote location. See Figure 2 for an application where the 360-80 is used to "drop" dedicated circuits from a E1 and then send the switched voice over a E1 to a PBX.

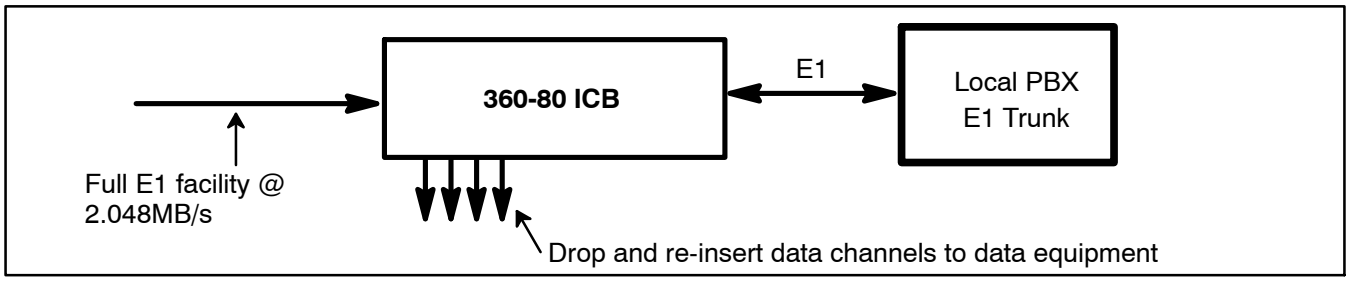


Figure 2. Drop and Re-Insert Application #1

Additionally, data/voice from cards in the 360-80 can be "re-inserted" into any vacant timeslots to the remote location. This allows better use of the E1 timeslots by keeping them as full as possible between locations. See Figure 3 for an application where the 360-80 is used to "drop" channels and re-insert channels from multiple locations to reduce the number of E1s needed between locations by keeping the E1 full. If a fault occurs in the 360-80 system, the E1 into the E1-S is connected to the E1 into the SE1U, bypassing the 360-80 system.

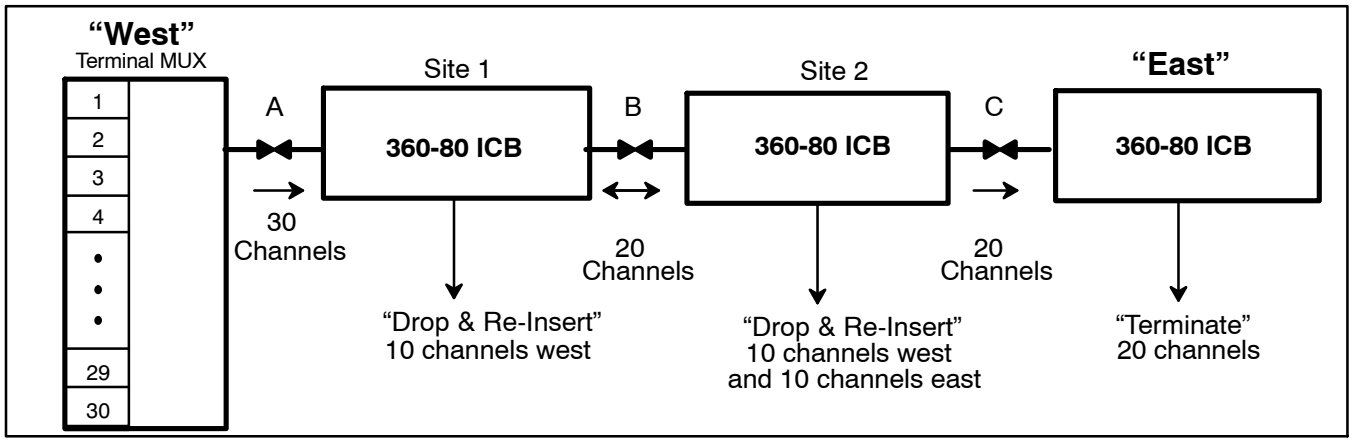


Figure 3. Drop and Re-Insert Application #2

Another configuration that can use the drop and re-insert capability allows the system to handle more than 2 types of circuits at a location. In this configuration, the drop and re-insert capability is used to combine the card types in multiple 360-80s at a single location to allow more card types at the location. Each bank has a different card type to allow more interfaces to be serviced at the location. This allows flexibility when customer requirements change.

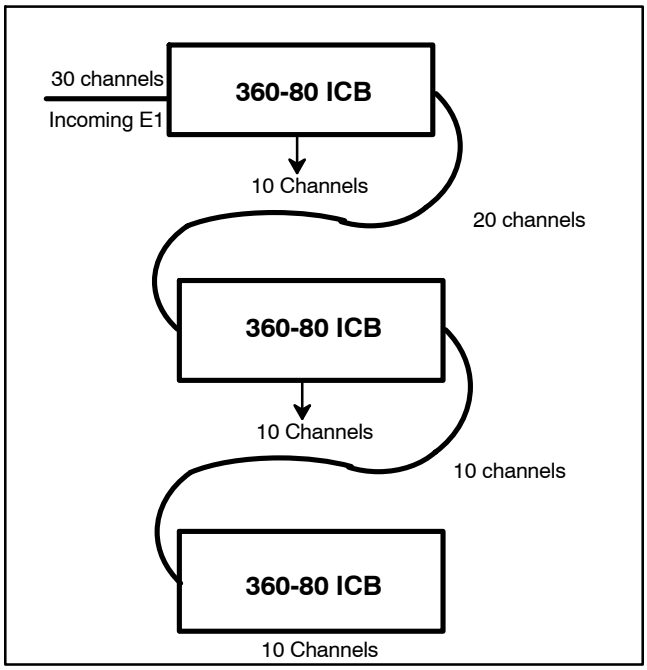


Figure 4. Drop and Re-insert Application #3

4. CIRCUIT DESCRIPTION

Figure 5 shows a block diagram of the SE1U, and its relationship to other elements of the 360-80 ICB.

4.1 Drop and Re-Insert Configuration

The E1-S provides the centralized control, multiplexing and test features for the 360-80 ICB. E1 signals from and to the WEST (primary E1) direction are first routed through the SE1U to the E1-S. The SE1U uses timing from the E1-S and must be loop timed to the WEST to operate correctly.

E1 signals from and to the EAST (secondary E1) direction are routed to the SE1U. The SE1U includes a monitor jack access to the E1.

The SE1U provides a bypass relay path for the E1 facility as part of the assembly, as shown in Figure 5. When de-energized, these relays bypass the ICB and connect the WEST (primary) E1 to the EAST (secondary) E1. When the SE1U and E1-S are installed and functioning properly, these relays are energized. Figure 5 shows the relay contacts in this mode. If either of these modules fail or the E1-S is removed, the relay will release and by-pass the E1. The SE1U can also be manually selected to bypass the E1.

The SE1U provides various front panel indicators to monitor operation .

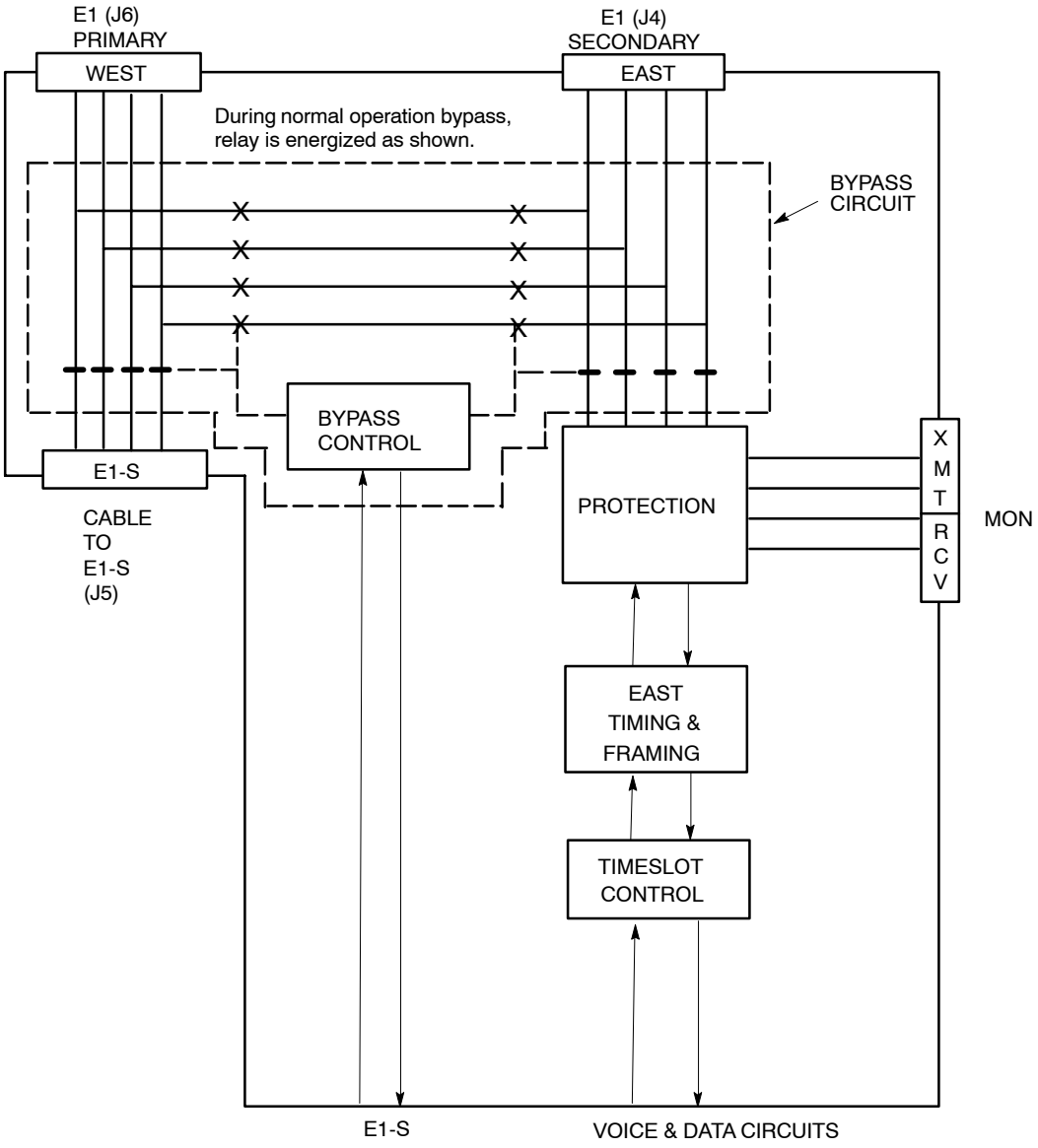


Figure 5. Secondary E1 Unit Block Diagram

4.1.1. Transmission Path, WEST RCV to EAST XMT

E1 signals received from the WEST facility (J6) pass through the SE1U bypass circuit (through the rear-panel connection, J5) into the E1-S. The information, in DS0 timeslots that are dropped at this location, can be provisioned to pass (through an internal circuit) on to the E1 on the SE1U (Broadcast) or replaced with idle code. Timeslots that are not dropped at this location can be passed through, unaltered, to the SE1U and transmitted EAST (J4). Timeslots that have been dropped can be reassigned for use towards the EAST.

The SE1U formats the timeslot data and inserts either conventional CAS or CRC4 framing. The data is then output to the EAST E1 connector.

4.1.2. Transmission Path, EAST RCV to WEST XMT

E1 signals received from the EAST (secondary) facility are routed to the SE1U's monitor jack and to the *EAST TIMING FRAMING* circuit. This circuit detects either conventional CAS or CRC4 framing. A loss of signal or framing will cause the AR LED to illuminate and start the alarm processing routine. The framed DS1 signal is passed on to the *TIMESLOT CONTROL* circuit. Any DS0 channel timeslot that has been provisioned to be dropped from the WEST will have it's transmit data blocked toward the WEST from the EAST E1 receive data. These EAST E1 receive timeslots can be dropped from the EAST or left unassigned. East E1 receive timeslots that are not

dropped at this location are passed through unchanged to the WEST facility. Dropped EAST E1 timeslots that are not blocked toward the WEST, due to the WEST RECEIVE E1 timelsot being dropped, may use the timeslot mode's broadcast option. This option allows timeslot data to be dropped and retransmitted toward the WEST.

The channel data at this location is re-inserted by the *TIMESLOT CONTROL* toward the WEST.

4.2 Timeslot Allocation

The following rules apply when assigning or allocating timeslots to channels when using the SE1U in conjunction with the E1−S:

- Only non-allocated timeslots can be allocated to a channel (channel number is based on chassis slot location and circuit number on card).
- Only non-allocated channels can be allocated to a timeslot.
- A timeslot/channel is de-allocated by selecting the channel and deleting its allocation.
- Timeslots can only be allocated to a single channel (see Figure 6).
- Timeslots 0 and 16 are not available (these are reserved for framing and signalling).
- When a channel uses multiple timeslots such as 64xN, ISDN, etc. there must be enough consecutive timeslots to allow the channel to be allocated (an example is shown in Figure 6 where channel 24 uses timeslots 22−24 on the primary E1).
- There are 60 timeslots available for allocation (30 for Primary E1 and 30 for Secondary E1).
- When the unit comes from the factory or a factory default reset is performed all timeslots will be allocted to the Primary E1 (similar to channels 1−5 in Figure 6).
- When the unit comes from the factory or a factory default reset is performed and a chassis slot does not have a card installed; then the timeslots normally assigned to the channels of the uninstalled card will be allocated to 'phantom channels'. These timeslots must be de-allocated before they can be allocated to a channel.
- When a different card is inserted into a chassis slot that had timeslots allocated, the system will attempt to allocate the timeslots to the card channels based on the card type.
- Timeslot allocation can be done through any of the network management interfaces.

4.2.1. Changing Channels/Timeslots

Any channel can be assigned to any timeslot (except 0 and 16). Using Figure 6 as an example, if channel 16 were allocated to timeslot 13 on the Primary E1, the following steps would be performed to change the allocation of channel 20 to timeslot 13:

Step	Action
1.	De-allocate the current allocation by selecting channel 16 in the timeslot allocation section of the network management interface and deleting its allocation.
2.	Select channel 20 and allocate it to timeslot 13 of the Primary E1.

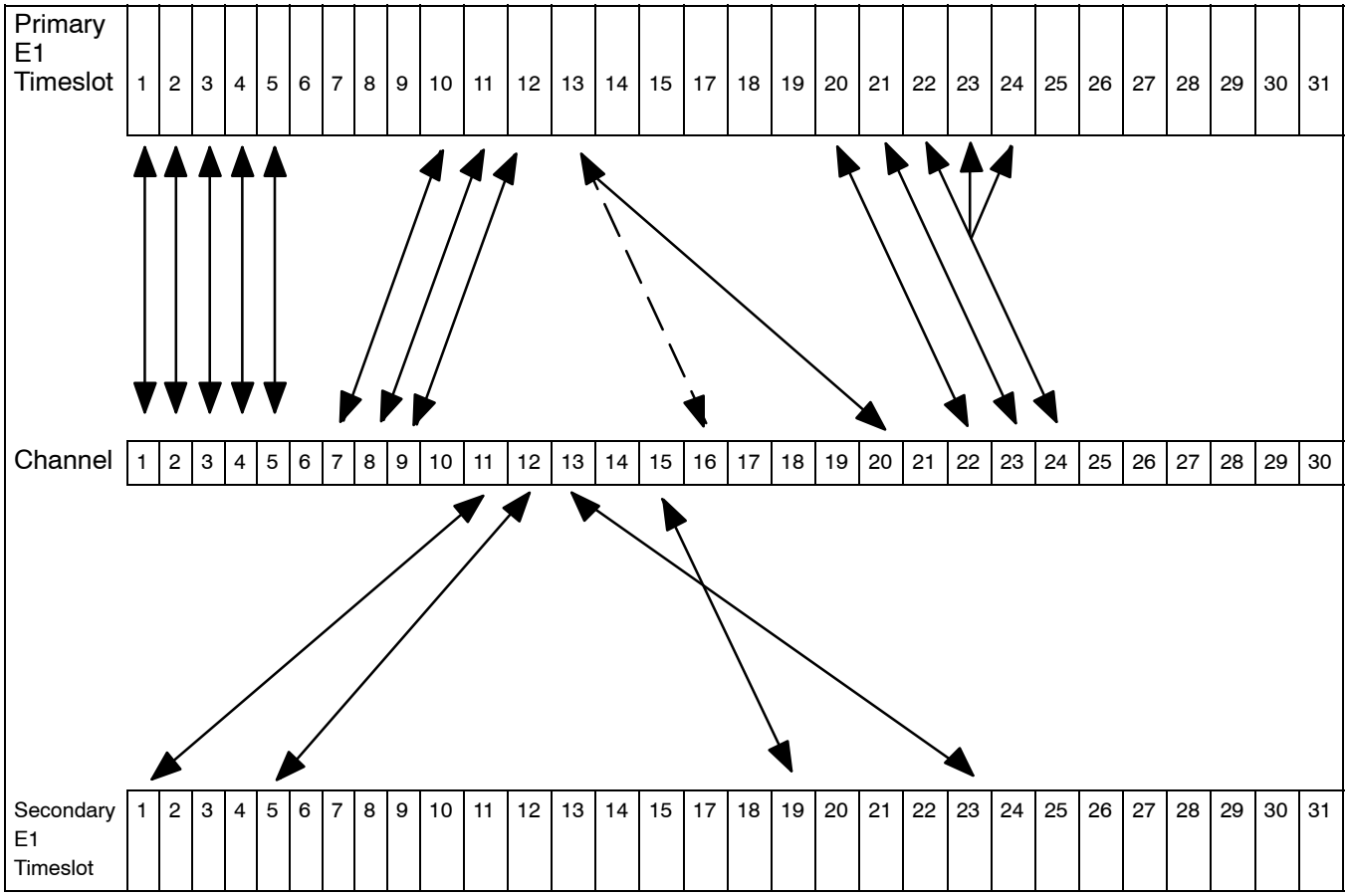


Figure 6. Timeslot Allocation with E1-S and SE1U

4.3 Timeslot Mode

The SE1U and E1-S use the timeslot mode to control the routing of data between E1-S and SE1U. The timeslot mode can be set to idle or broadcast.

4.3.1. Timeslots Allocated on both Primary and Secondary E1 Circuits

When a timeslot from the primary E1 is allocated to a channel and the same timeslot on the secondary E1 is allocated to another channel, the data is routed between the channels and the individual timeslot of the two E1s. With this allocation the timeslot mode for both the primary and secondary E1s will be ignored. This allocation mode is referred to as “Drop and Reinsert” because, the timeslot data is dropped and re-inserted between one of the E1s and the allocated channel. Data from a different channel is dropped and re-inserted or routed between the channel and the same timeslot of the other E1.

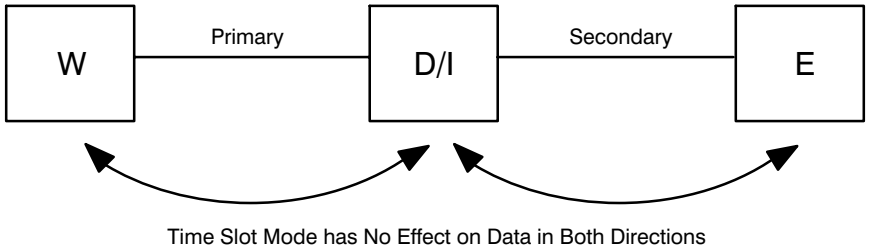


Figure 7. Drop at E1 Primary and Secondary for the Same Timeslot

4.3.2. Timeslot Allocated on the Primary E1 Circuit

When a timeslot from the primary E1 circuit is allocated to a channel, the timeslot mode of the primary E1 circuit will be ignored and not affect the routing of the data. If the timeslot on the secondary E1 circuit is set for idle,

then the output data for the timeslot on the secondary E1 circuit will be an all ones (11111111) which equates to an “idle” signal. If the timeslot on the secondary E1 circuit is set for broadcast, then the output data for that time-slot of the secondary E1 circuit will be the same data that is received from the timeslot on the primary E1 circuit. This allocation is called “Broadcast mode” because the data from the time slot on the primary E1 circuit is broad-cast to both the channel and the secondary E1 timeslot.

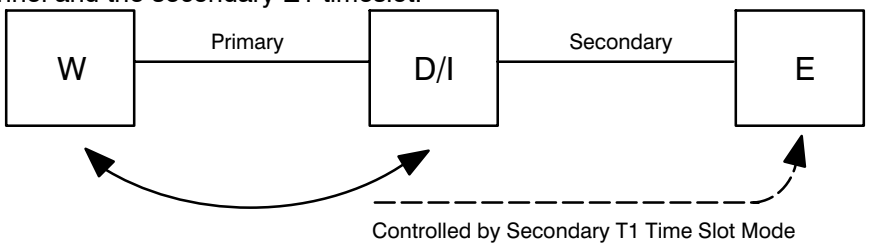


Figure 8. Drop at E1 Primary with No Drop on Secondary

4.3.3. Timeslot Allocated on the Secondary E1 Circuit

When a timeslot is allocated from the secondary E1 to a channel, the timeslot mode of the secondary E1 timeslot is ignored and does not affect the data routing. Data is routed from the allocated channel to and from the time slot on the secondary E1 circuit. If the timeslot on the primary E1 is set to idle, the output data for the timeslot on the primary E1 will be an all ones (11111111) which equates to an “idle” signal. If the time slot on the primary E1 is set to broadcast, then the output data on the primary E1 for the timeslot will be the same data that is sent from the secondary E1 to the allocated channel. This allocation is called Broadcast mode because, the data from the timeslot on the secondary E1 circuit is broadcast to the channel and to the primary E1 timeslot.

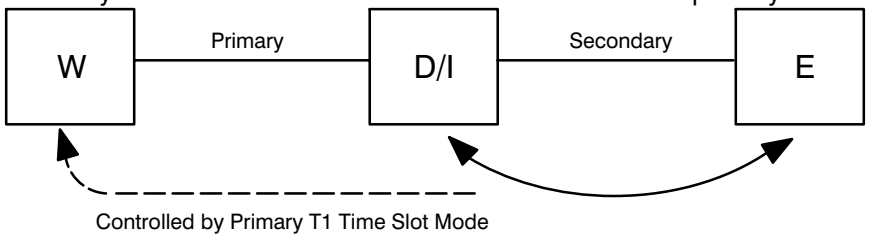


Figure 9. Drop at E1 Secondary with No Drop on Primary

4.3.4. Non-Allocated Timeslots

When a timeslot is not allocated to either the primary E1 circuit or the secondary E1 circuit, the primary and sec-ondary timeslot mode determines the data output on the respective E1. If the mode is set to idle, the output of the timeslot will be an all ones (11111111) which equates to an “idle” signal. If the mode is set to broadcast then the output of the timeslot on the E1 will be the data from the corresponding time slot on the other E1. This allocation mode is referred to as “Pass Through” because, when both primary and secondary timeslot modes are set to broadcast the data passes through the 360-80.

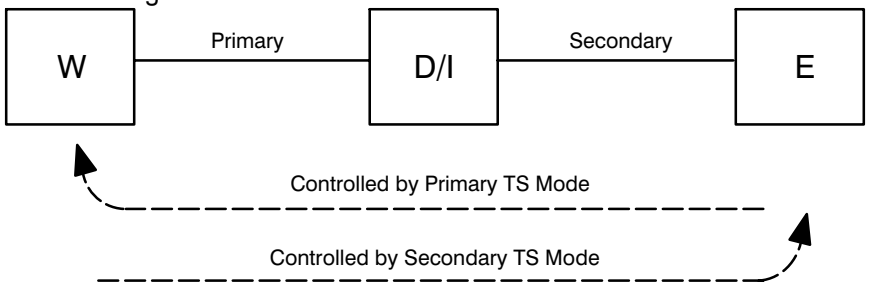


Figure 10. No Drop at E1 Primary or Secondary

4.4 Forced Bypass (Manually Selected via Management)

WARNING

If this option is selected for an ICB, it will require local intervention at the site of the ICB to reset. Restoring normal error free operation of the ICB will require a "reset" to return to stored values on a local craft interface or Ethernet connection, or removing both the E1-S and SE1U. The cards must then be reinserted in order, first the E1-S, followed by the SE1U.

Card configuration is stored in an EEPROM so no additional settings adjustments are required.

4.5 Facility Alarm Handling

The alarm timing circuit provides the indications and timing for the trunk processing. Hit integration for Frame Loss (FRL) is provided to prevent trunk processing during intermittent frame losses. LEDs are provided for local red alarm (AR) and remote yellow alarm (AY).

The E1-S provides three optional trunk processing timing options (both primary and secondary E1s are configured the same) that are selected via the NMS software.

When a loss of signal or framing is detected on the WEST receive facility, a Red Alarm (AR) is declared and the WEST AR LED is illuminated after 2.5 seconds (1 second if CM2 option is selected or immediately if the CM3 option is selected), and the unit will begin its trunk processing routine. This causes the following:

1. All channel units are busied or idled
2. A yellow alarm (AY) condition is sent to the WEST transmit facility (if CM2 or CM3 is selected, a yellow alarm is not sent)
3. An AIS signal is sent to the EAST transmit facility on all unassigned channels going between EAST and secondary
4. The alarm relay for the WEST AR and AY is activated

Trunk processing will end approximately 15 seconds (1 second for CM2, immediately for CM3) after detection of no AR alarm condition.

When the WEST receive facility receives a yellow alarm condition from a distant terminal, the unit will declare a yellow alarm and illuminate the AY LED after detecting this condition for approximately 480 ms. At this time, the unit will begin its trunk processing routine that will:

1. Busy or idle all channel units
2. Send AIS code to the EAST transmit facility
3. Activate the alarm relay for the West AR and AY

Trunk processing will end approximately 30 ms after detection of no yellow alarm.

When a red alarm (AR) is detected on the East facility, a yellow alarm (AY) is sent back on the East facility. If a yellow alarm is detected on the east facility, no other action is taken. Red or yellow alarms detected on the East facility will illuminate the respective AR and/or AY LEDs. When the red alarm condition no longer exists for approximately 15 seconds, the yellow alarm signal will stop being sent. If no yellow or red alarm conditions are detected, the LEDs will turn off.

4.6 Loopback

The loopback loops the data back toward the customer's drop-side equipment.

5. INSTALLATION

5.1 Installing the Unit

The SE1U installs in the secondary E1 slot of the 360-80. See Figure 11 for a sample of the shelf layout.

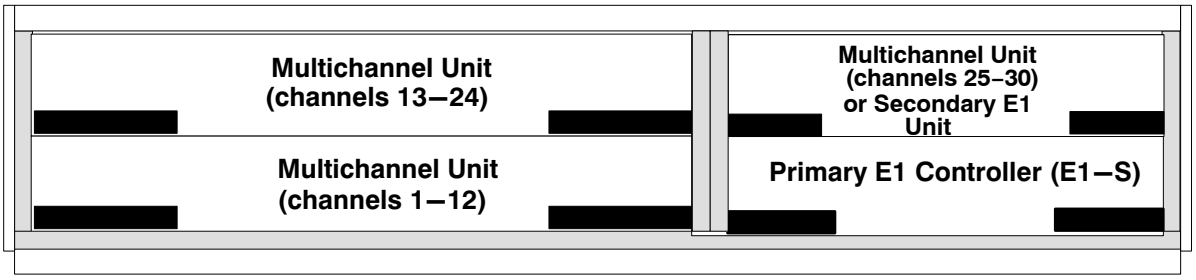


Figure 11. 360-80 ICB Common Equipment Configuration

5.1.1. Attaching the Rear Panel

The rear panel of the unit should be installed before the unit is installed in the shelf, and before wiring begins.

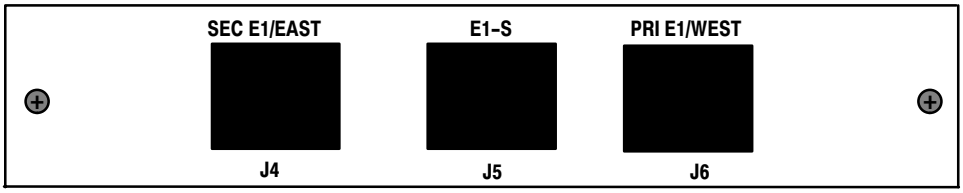


Figure 12. 3608-85 SE1U Rear Panel

5.1.2. Installing a New Unit

Use the following steps to install the SE1U.

Step	Action
1.	If not already installed, install the rear panel, screwing it to the appropriate mounting locations on the shelf using the provided hardware. **<u>WARNING:</u> If there is already a rear panel installed on the shelf, check for interference when mounting. The rear panel may need to be removed and replaced with the rear panel that has been shipped with the new unit.**
2.	Insert the unit into the shelf, making sure that the unit is aligned with the card guides inside the shelf.
3.	Slide the unit fully into the shelf. Use the insertion lever to fully seat the unit.
4.	Once the unit is fully inserted, tighten the securing screw on the front panel of the unit. When power is applied, the unit will perform a self-test to ensure that it is compatible with the network management software on the system.
5.	Wire the unit per the wiring information in the wiring section.
6.	After the self-test is performed, check the software provisioning of the unit using either the front panel craft interface on the front of the controller unit or the network management interface on the rear of the controller (see the section on network management for more information on this interface). *Note: If a Secondary E1 unit is inserted into a shelf while power to the shelf is on, the E1 controller unit will reset.*

5.1.3. Installing a Replacement Unit

If you are replacing a unit that is already in service, insure that the new unit is the same as the unit being replaced.

Step	Action
1.	Remove the wiring connectors from the front and rear of the unit (J4, J5 & J6).
2.	Unscrew the front panel securing screw to release the unit from the shelf.

Step	Action
3.	Using the card ejector, remove the unit from the shelf.
4.	Follow the procedure for installing a new unit.

5.2 Wiring the Unit

5.2.1. Drop and Re-Insert Application

If a coax (75 ohm) connection is needed, a Balun (#97−001811−A) is available to convert from twisted pair (120 ohm) to coax.

Use the following steps to wire the unit (see Figure 13).

Step	Action
1.	Connect the E1 from the WEST 360-80 ICB or equivalent to J6 of the SE1U.
2.	Using the cable provided with the unit, connect J5 to J1 on the E1-S.
3.	Connect J4 of the SE1U to the input of the next 360-80 ICB or to the EAST 360-80 ICB or equivalent.

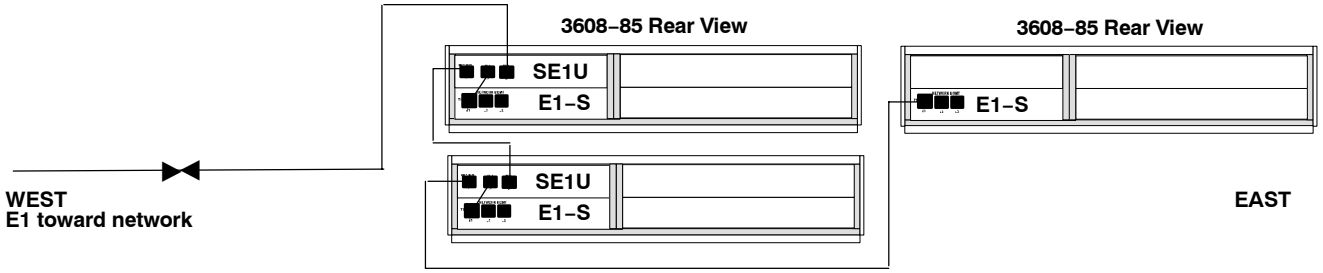


Figure 13. Wiring for Drop and Re-Insert Application

5.3 Front Panel Switch and LED Definitions

The Audible Alarm Cut Off (ACO) switch is a pushbutton used to open the audible alarm contacts from the 360-80 system. This switch will only mask audible indications of present alarm conditions—it does NOT clear the alarm. If a new alarm occurs, the audible indication will re-enable.

Table 1. LED Definitions

Label	Color	Indicates that...
POWER	Green	The unit is receiving power
AR	Red	The unit is detecting a red alarm on the E1 interface caused by a loss of signal (LOS) or a loss of framing (LOF) or out of frame (OOF) condition.
AY	Yellow	The unit is receiving a YELLOW alarm condition on the E1. This indicates that a problem is upstream at some other device or network node.
TP	Yellow	The system is processing the trunk signaling data based on detected alarm conditions.
LP	Green	The unit is in a loopback condition. This indication only occurs during testing.
BYPASS	Green	The unit is in a bypass condition.

5.4 Connector Definitions

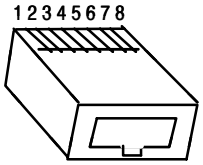
5.4.1. Bantam Jacks

The two bantam jacks on the front of the unit allow monitoring of the transmit (XMT) and receive (RCV) sides of the secondary E1 signal without interfering with operation.

5.4.2. E1 Jacks

The RJ48 connectors on the rear of the SE1U are for the E1-S, east/secondary E1 and west/primary E1.

Table 2. RJ-48C E1 Jack Pinouts



Pin #	Use
1	R (RCV from network)
2	T (RCV from network)
3	—
4	R1 (XMIT to network)
5	T1 (XMIT to network)
6	—
7	—
8	—

6. OPTIONING

This unit comes from the factory with default provisioning, which can be changed through the Network Management software (NMS) or the craft terminal interface. See the NMS or craft terminal interface documentation for procedures. The provisioning options are as follows with the default optioning noted:

Option	Choices	Default
E1 Frame format	Conventional CAS, CRC4 CAS	CRC4
Remote Control Method	None, Occupy One Channel, Facility Data Link	Facility Data Link
Bypass	Auto Bypass, Forced No Bypass	Auto Bypass

7. ALARMS

This unit provides for alarm contacts for audible and visual alarms. Access to the alarm contacts is provided on the 360-80 shelf. Pressing the audible alarm cut-off (ACO) switch on the SE1U clears the secondary alarm indication for the audible alarm contacts, stopping the audible notice of the alarm (the alarm itself is NOT cleared by pressing the ACO switch). See the shelf documentation for information on wiring. The unit generates alarm indications based on the configuration of the PRI E1 alarm registers (Normal, CM2, CM3). See section on network management for more information.

8. TECHNICAL ASSISTANCE

If technical assistance is required, contact Charles Technical Services Center at:

847-806-8500
847-806-8556 (FAX)
800-607-8500
techserv@charlesindustries.com (e-mail)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles offers a 2-year warranty on this product. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles
5600 Apollo Drive
Rolling Meadows, Illinois 60008-4049
847-806-6300 (Main Office)
847-806-6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles offers an “advanced replacement” service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the pre-addressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles for either repair and quality testing or exchanged for a replacement unit, as determined by Charles. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the Charles Service Center at 217-932-5292 (FAX 217-932-2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   – Company name and address
   – Contact name and phone number
   – Inventory of equipment being shipped
   – Particulars as to the nature of the failure
   – Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   Charles Service Center
   503 N.E. 15th St, P.O. Box 339
   Casey, IL 62420-2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS

10.1 Electrical

Parameter	Specification
Carrier Mode	Pulse Code Modulation (PCM)
2.048MB/S Framing Format	E1 interface complies with the ITU−T G.703, G.704. G.775
Line code	HDB3
Input/output impedances	120 Ohms
Transmission Rate	2.048 MB/s ± 32 ppm
ICB timing	Timing from E1-S
E1 CONNECTOR (rear panel.)	RJ-48C
E1 monitor bantam jacks (On front panel only)	Use to monitor the secondary E1 signal (both transmit and receive) without interference.
Alarm interface and contacts	The system provides visual and audible alarm contact closure when the channel bank is in alarm or there is a loss of power. When the ACO (Audible Alarm Cut Off) is activated, the audible alarm contacts return to open circuit.
ACO switch (front panel)	Use to silence the audible alarm contacts
Voice port test and 0 dBm calibration tone (software selectable on a per-channel basis)	DTMF port test sequence or 1 KHz 0 dBmO level calibration tone
Power supply input voltage range	−42V to −56V
Power supply current	.063 amp (normal), .038 amp (bypass)
Heat dissipation	3.15 watts (normal), 1.94 watts (bypass)

10.2 Physical

See Table 3 for the physical characteristics of the unit.

Table 3. Physical Specifications

Feature	U.S.	Metric
Height	0.75 inch	1.9 centimeters
Width	5.64 inches	14.32 centimeters
Depth	9.25 inches	23.49 centimeters
Weight	0.64 pound	290 grams
Temperature	−40° to +149° F	−40° to +65° C
Humidity	to < 95%	