3660-80 12-Channel Manual Ringdown Adapter

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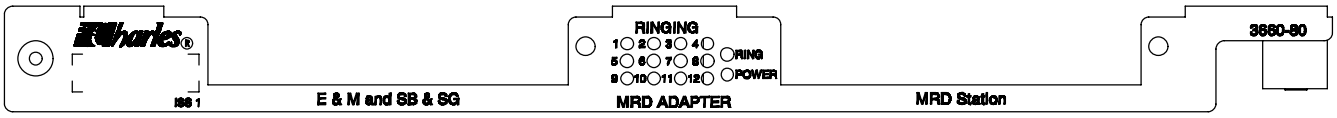

Figure 1. 3660-80 Front Panel

1. GENERAL

1.1 Document Purpose

This document provides general, installation and testing information for the 12-channel 2-wire (2W) or 4-wire (4W) Manual Ringdown Adapter card. This document covers model number 3660-80.

1.2 Equipment Function

The Manual Ringdown Adapter card is part of the 360-80 Intelligent Channel Bank (ICB).

1.3 Equipment Location/Mounting

The 3660-80 plugs into any full size slot of the Charles Industries 360-80 ICB. This unit can only be used in issue 3 or later ICB shelves. The unit can be plugged into the same shelf as the E&M unit for a total of 12 MRD Circuits. One to two units can be plugged into a separate shelf (no controller card needed) for a total of 24 MRD circuits when used with two E&M units. An external ring generator is required.

1.4 Equipment Features

This unit provides the following features:

- Supports 2W or 4W manual ringdown to E&M conversion
- Supports E&M signaling type III
- Provides E&M type signalling that is separate from the voice leads
- Supports both 2W and 4W interfaces with 600-ohm operation

1.5 Indicators

This unit provides the following status information:

- LED power indicator
- LED ring generator input indicator
- Per channel ringing LED status. Indicates ringing activity that originates from the near or far end.

1.6 Configuration

This unit provides the following hardware configurable options. There is no software management for the MRD unit, as it is an extension of the E&M unit and it can be placed in a shelf with no T1 controller.

- Per channel strap selection of 2W or 4W operation
- Per channel dipswitch selection of “No Code Manual Ringdown”, a single two second burst of ringing voltage applied towards the far end when ringing voltage is removed from the near end, or “Repeat Input Manual Ringdown”, ringing voltage repeated toward the far end as it was applied to the near end.
- Per channel ringing LED status. Indicates ringing activity that originates from the near or far end.

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 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

A typical application of the 3660–80 Manual Ringdown Adapter is shown in Figure 2. In this application, two 360–80 channel banks provide E&M signalling and audio at two locations through a T1/E1 facility. The MRD adapter provides a conversion from E&M signalling and audio to manual ringdown, as required by a manual ringdown station. The unit supports both 2W and 4W modes.

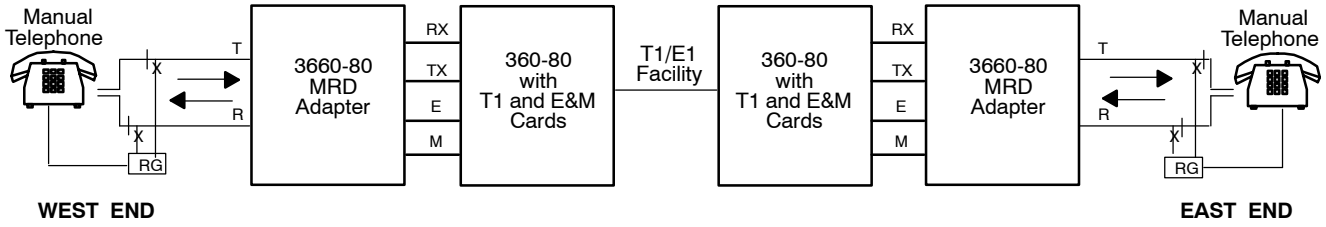

Figure 2. Typical Manual Ringdown Application

4. CIRCUIT DESCRIPTION

The following describes one of the circuits on the unit and can be considered typical of any of the circuits.

4.1 Transmit Call Operation

A transmit call starts when the MRD station sends a ringing signal to the MRD adapter. The MRD adapter detects the ringing when in the range of 17Hz to 33Hz with an amplitude greater than 55 Vrms. Upon ring detection, a relay opens the receive audio path to the E&M card preventing ringing from entering the audio circuits. A second relay will close, changing the state of the M-signal from - 48VDC to ground, as specified by E&M signalling type III. When the MRD station removes the ringing signal, the audio path is reestablished and the M-signal returns to -48VDC. Audio communication may proceed. Audio transmit attenuation is selected at the E&M card.

4.2 Receive Call Operation

A receive call starts when the channel bank toggles the E-signal from ground to open. When an open signal is detected on the E-signal, a relay is closed breaking the audio to the MRD station, providing a 600-ohm termination to the channel bank receive audio. A second relay is also closed, switching a ring signal to the MRD station. The ring signal is provided externally to the MRD adapter through a connector. When the E-signal is removed by

the channel bank, the 600-ohm termination and ring signals are removed. Audio communication may now take place.

4.3 Repeat Input Manual Ringdown/No Code Manual Ringdown

The MRD adapter has two different modes of ringing operation. The mode is selectable with a dipswitch setting on a per channel basis. Different modes may be set for either end of a channel.

Mode	Description
Repeat Input Manual Ringdown	Ring voltage is repeated at the near end as it was applied for the far end.
No Code Manual Ringdown	Ring voltage is applied at the near end for two seconds after ring voltage is removed at the far end.

4.4 LED indications on the MRD and E&M units

Repeat Input Manual Ringdown Near End Far End

Signalling State	MRD	E&M	MRD	E&M
Idle	Off	On	Off	On
Ring Voltage applied at Near End	On	On	On	Off

No Code Manual Ringdown Near End Far End

Signalling State	MRD	E&M	MRD	E&M
Idle	Off	On	Off	On
Ring Voltage applied at Near End	On	On	Off	Off
Ring Voltage removed from Near End. (2 second duration)	Off	On	On	On

5. INSTALLATION

5.1 Installing the Unit

5.1.1. Attaching the Rear Panel

The rear panel of the 3660-80 should be installed before all other units are installed in the shelf, and before wiring begins.

Figure 3. 3660-80 2W/4W Manual Ringdown Adapter Rear Panel

5.1.2. Installing a New Unit

Ensure that all manual optioning is done on the new unit. See Figure 4 for option locations.

Note: Any manual optioning that is not done before the card is installed will require the system to discontinue service on all circuits when the card is removed for optioning in the future.

Step	Action
1.	Set hardware options as described in the section on *Hardware Optioning* in this document.
2.	If not already installed, install the rear panel, screwing it to the appropriate mounting locations on the shelf using the provided hardware. **WARNING** **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.**
3.	Insert the unit into the shelf, making sure that the unit is aligned with the card guides inside the shelf.
4.	Slide the unit fully in to the shelf. If inserting more than one unit, it may be easier to slide in both units at the same time.
5.	Once the unit is fully inserted, tighten the securing screw on the front panel of the unit.
6.	Wire the unit per the wiring information in the wiring section.

5.1.3. Installing a Replacement Unit

If you are replacing a unit that is already in service, ensure that the unit is the same type and that the hardware has been optioned to match the unit being replaced.

Step	Action
1.	Remove the wiring connectors from the front and rear of the unit.
2.	Unscrew the front panel securing screw to release the unit from the shelf.
3.	Using the card ejector, remove the unit from the shelf.
4.	Inspect the manual optioning of the new unit and insure that the optioning is the same as the one removed.
5.	Follow the procedure for installing a new unit.

5.2 Wiring the Unit

The unit comes with two TELCO cables for interfacing to the E&M unit. The rear connector on both the MRD and E&M unit are connected together for audio. The front left connector (when viewing from the front) on the MRD connects to the front of the E&M for signalling. The front right connector on the MRD connects to the customer's MRD station equipment.

Note: Removal of the front E&M signalling cable during normal operation may cause ringing to occur at the far end MRD. When doing maintenance, it is recommended that the E&M unit be removed when taking off this cable to prevent the far end from ringing.

The unit is also shipped with two TELCO connector lock clips that are inserted thru the cable connectors for securing to the channel unit's connectors.

An external ring generator is required and connects to the RING GEN IN plug on the rear of the MRD unit.

Reference Table 1 to determine the correct pin connections for the TELCO connector on the back of the unit.

Table 1. Pin Chart for 50-pin Female (25-pair) TELCO Connector on BACK Panel of the 3660-80

Circuit	Pin	
Circuit 1	Pin 1 = R	Pin 26 = T
	Pin 2 = R1	Pin 27 = T1
Circuit 2	Pin 3 = R	Pin 28 = T
	Pin 4 = R1	Pin 29 = T1
Circuit 3	Pin 5 = R	Pin 30 = T
	Pin 6 = R1	Pin 31 = T1
Circuit 4	Pin 7 = R	Pin 32 = T
	Pin 8 = R1	Pin 33 = T1
Circuit 5	Pin 9 = R	Pin 34 = T
	Pin 10 = R1	Pin 35 = T1
Circuit 6	Pin 11 = R	Pin 36 = T
	Pin 12 = R1	Pin 37 = T1
Circuit 7	Pin 13 = R	Pin 38 = T
	Pin 14 = R1	Pin 39 = T1
Circuit 8	Pin 15 = R	Pin 40 = T
	Pin 16 = R1	Pin 41 = T1
Circuit 9	Pin 17 = R	Pin 42 = T
	Pin 18 = R1	Pin 43 = T1
Circuit 10	Pin 19 = R	Pin 44 = T
	Pin 20 = R1	Pin 45 = T1
Circuit 11	Pin 21 = R	Pin 46 = T
	Pin 22 = R1	Pin 47 = T1
Circuit 12	Pin 23 = R	Pin 48 = T
	Pin 24 = R1	Pin 49 = T1

5.2.1. E&M Signaling TELCO Connector

Reference Table 2 to determine the correct pin connections for the E&M Signalling TELCO connector on the front of the unit.

Note: MB is also known as SB. EB is also known as SG

Table 2. Pin Chart for 50-pin Female (25-pair) E&M Signalling TELCO Connector on FRONT of 3660-80

Circuit	Pin	
Circuit 1	Pin 1 = M	Pin 26 = E
	Pin 2 = MB	Pin 27 = EB
Circuit 2	Pin 3 = M	Pin 28 = E
	Pin 4 = MB	Pin 29 = EB
Circuit 3	Pin 5 = M	Pin 30 = E
	Pin 6 = MB	Pin 31 = EB
Circuit 4	Pin 7 = M	Pin 32 = E
	Pin 8 = MB	Pin 33 = EB
Circuit 5	Pin 9 = M	Pin 34 = E
	Pin 10 = MB	Pin 35 = EB
Circuit 6	Pin 11 = M	Pin 36 = E
	Pin 12 = MB	Pin 37 = EB
Circuit 7	Pin 13 = M	Pin 38 = E
	Pin 14 = MB	Pin 39 = EB
Circuit 8	Pin 15 = M	Pin 40 = E
	Pin 16 = MB	Pin 41 = EB
Circuit 9	Pin 17 = M	Pin 42 = E
	Pin 18 = MB	Pin 43 = EB
Circuit 10	Pin 19 = M	Pin 44 = E
	Pin 20 = MB	Pin 45 = EB
Circuit 11	Pin 21 = M	Pin 46 = E
	Pin 22 = MB	Pin 47 = EB
Circuit 12	Pin 23 = M	Pin 48 = E
	Pin 24 = MB	Pin 49 = EB

5.2.2. Manual Ringdown Station TELCO Connector

Reference Table 3 to determine the correct pin connections for the Manual Ringdown Station TELCO connector on the front of the unit.

Table 3. Pin Chart for 50-pin Female (25-pair) Manual Ringdown Station TELCO Connector on FRONT of 3660-80

Circuit	4-Wire Pinouts		2-Wire Pinouts	
Circuit 1	Pin 1 = R	Pin 26 = T		
	Pin 2 = R1	Pin 27 = T1	Pin 2 = R	Pin 27 = T
Circuit 2	Pin 3 = R	Pin 28 = T		
	Pin 4 = R1	Pin 29 = T1	Pin 4 = R	Pin 29 = T
Circuit 3	Pin 5 = R	Pin 30 = T		
	Pin 6 = R1	Pin 31 = T1	Pin 6 = R	Pin 31 = T
Circuit 4	Pin 7 = R	Pin 32 = T		
	Pin 8 = R1	Pin 33 = T1	Pin 8 = R	Pin 33 = T
Circuit 5	Pin 9 = R	Pin 34 = T		
	Pin 10 = R1	Pin 35 = T1	Pin 10 = R	Pin 35 = T
Circuit 6	Pin 11 = R	Pin 36 = T		
	Pin 12 = R1	Pin 37 = T1	Pin 12 = R	Pin 37 = T
Circuit 7	Pin 13 = R	Pin 38 = T		
	Pin 14 = R1	Pin 39 = T1	Pin 14 = R	Pin 39 = T
Circuit 8	Pin 15 = R	Pin 40 = T		
	Pin 16 = R1	Pin 41 = T1	Pin 16 = R	Pin 41 = T
Circuit 9	Pin 17 = R	Pin 42 = T		
	Pin 18 = R1	Pin 43 = T1	Pin 18 = R	Pin 43 = T
Circuit 10	Pin 19 = R	Pin 44 = T		
	Pin 20 = R1	Pin 45 = T1	Pin 20 = R	Pin 45 = T
Circuit 11	Pin 21 = R	Pin 46 = T		
	Pin 22 = R1	Pin 47 = T1	Pin 22 = R	Pin 47 = T
Circuit 12	Pin 23 = R	Pin 48 = T		
	Pin 24 = R1	Pin 49 = T1	Pin 24 = R	Pin 49 = T

6. OPTIONING

Each of the channels in the MRD unit is individually controlled and optioned.

6.1 Hardware Optioning

To set hardware options, the MRD unit must be removed from service. Hardware options should be set prior to installing the unit to prevent further interruption of service.

Table 4. Hardware Options

Option	Choices	Set Jumpers...
2W/4W Mode. Set using 2 jumpers. Both jumpers for that circuit must be changed together when the module is removed from the slot.	2W	Jx1 and Jx2 to jumper pin 2W
	4W (default)	Jx1 and Jx2 to jumper pin 4W
Repeat Input Manual Ringdown / **No Code Manual Ringdown Mode**	Repeat Input Mode (default)	S1, S2 – CHx to off
	No Code Mode	S1, S2 – CHx to on
Note: The x in Jx and CHx represents any of the channels.		

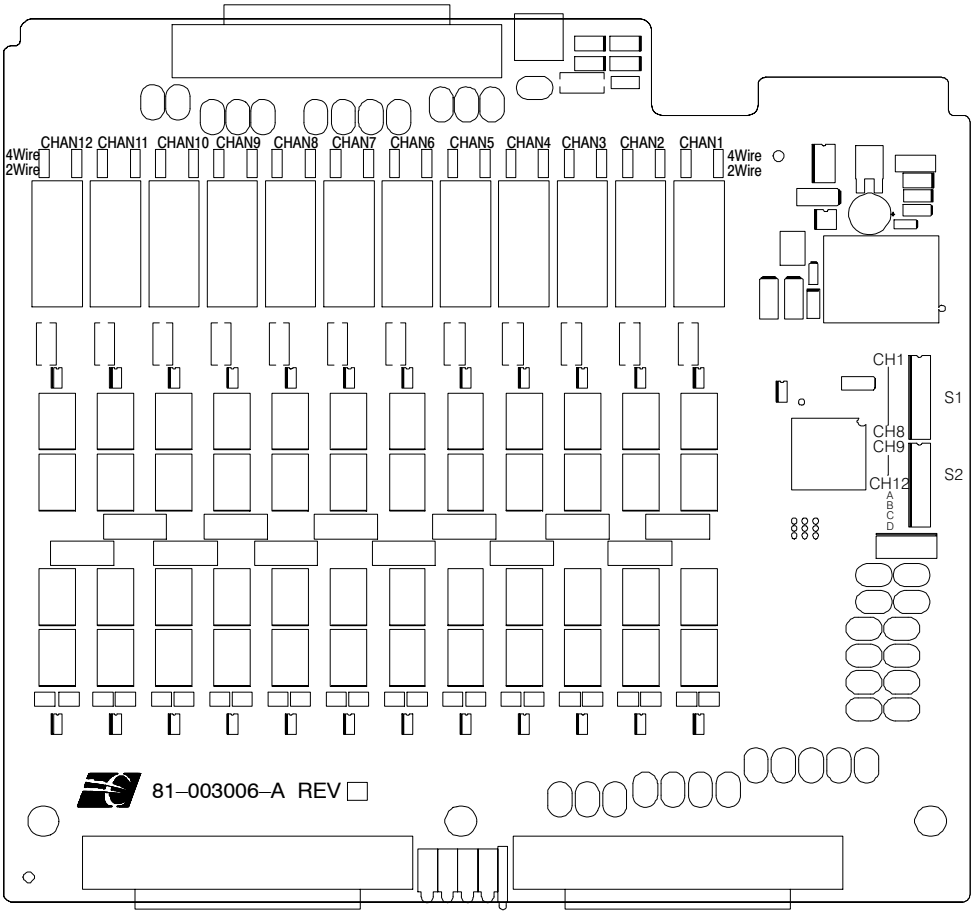

Figure 4. Location of Optioning Jumpers—3660-80

7. 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)

8. WARRANTY & CUSTOMER SERVICE

8.1 Warranty

Charles Industries, Ltd. 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 Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008-4049
U.S.A.
847-806-6300 (Main Office)
847-806-6231 (FAX)

8.2 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 Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

8.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. 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 preaddressed shipping label provided. Call your customer service representative at the telephone number above for more details.

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

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. 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 217-932-5288 (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
   U.S.A.

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.

9. SPECIFICATIONS

9.1 Regulatory

UL/CSA listed and FCC verified.

9.2 Electrical

Parameter	Function Specification	
Number of subscribers for each unit	12 circuits	
Operating mode	EM type III 2 or 4 wire	
Insertion Loss	0 dB ± 0.5 dB (@ 1004 Hz)	
Loss with Frequency Change (maximum) 300 – 3000 Hz 3000 to 3400 Hz	2 wire: –0.2 to +0.0 dB –0.2 to +0.0 dB	4 wire: –0.2 to +0.0 dB –0.15 to +0.0 dB
Impedance	4W Mode: 600 Ohm 2W Mode: 600 ohm + 2.16uf	
Longitudinal Balance with E&M Card 300 – 600 Hz 600 – 2400 Hz 2400 – 3000 Hz 3000 – 3400 Hz	2 wire: ≥ 58 dB ≥ 58 dB ≥ 58 dB ≥ 53 dB	4 wire: ≥ 64 dB ≥ 64 dB ≥ 64 dB ≥ 69 dB
Cross Talk Attenuation	> 65 dB	
LED Ringing POWER RING GEN	Ringing LEDs will be lit to indicate ringing status on a per channel basis. Power LED will be lit to indicate –48VDC is present. RING GEN LED will be lit to indicate ring voltage is present.	
Power Supply Current	0.242 amp. max	
Heat Dissipation	11.62 watts max	

9.3 Physical

See Table 5 for the physical characteristics of the unit.

Table 5. Physical Specifications Manual Ringdown Adapter Card (3660-80)

Feature	U.S.	Metric
Height	0.75 inch	1.9 centimeters
Width	9.625 inches	24.45 centimeters
Depth	9.25 inches	23.49 centimeters
Weight	1 pound, 10 ounces	.737 kilogram
Temperature	–32° F to + 120° F	–0° C to + 50° C
Humidity	<95% (non-condensing)	