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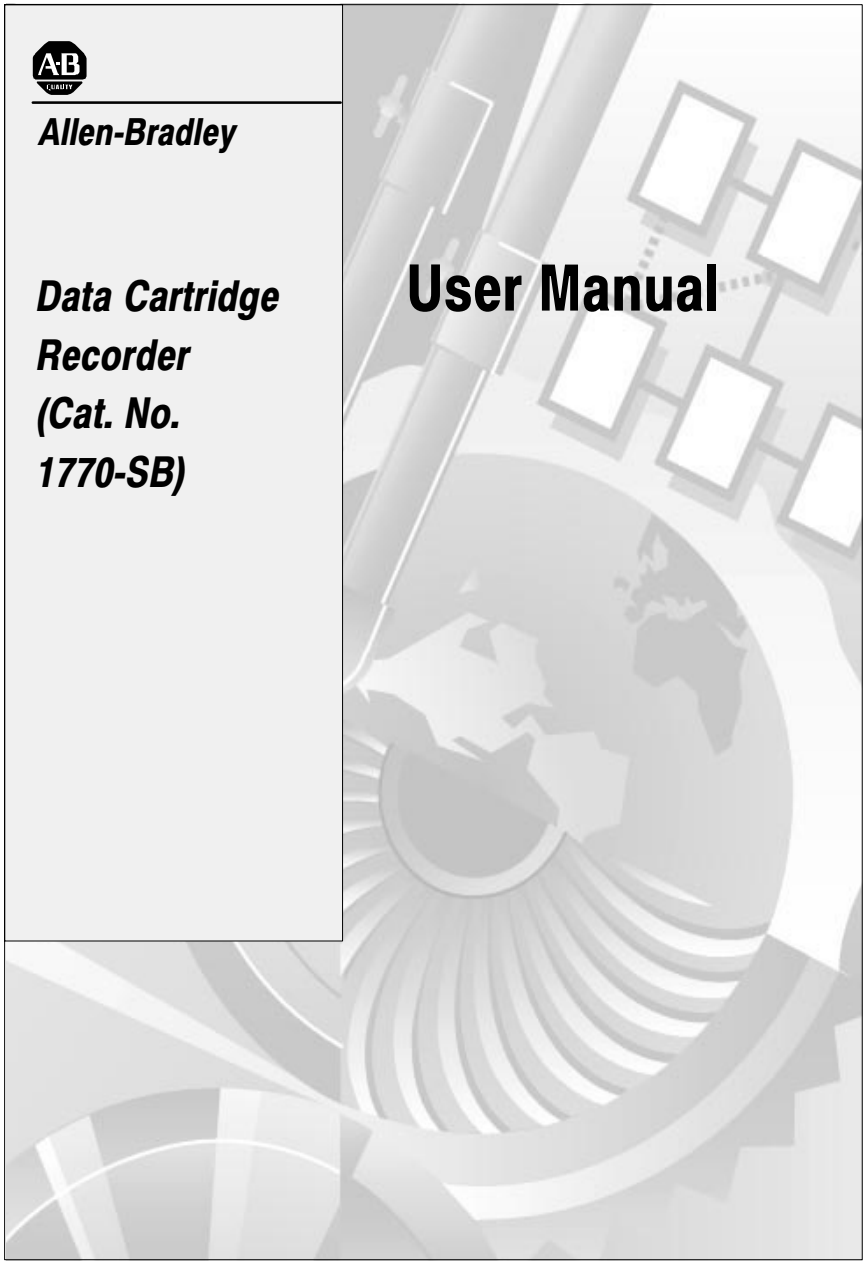
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Allen-Bradley

Data Cartridge Recorder (Cat. No. 1770-SB)

User Manual

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Chapter 1

Introduction

Scope of Manual

The Data Cartridge Recorder User's Manual describes the installation, operation, and intended uses of the Allen-Bradley Data Cartridge Recorder (cat. no. 1770-SB). Familiarity with the Allen-Bradley processor to be used with the recorder is assumed. If unfamiliar with an Allen-Bradley processor to be used with the recorder, refer to the document specified in table 1.A for further information.

Table 1.A
Supporting Documentation

Processor	Publication Tile	Publication Number
PLC-4 Microtrol	PLC-4 Microcontrol Programmable Controller Product Guide	1773-800
PLC-3	PLC-3 Programmable Controller Programming Manual	1775-801
PLC-2/30	PLC-2/30 Programmable Controller Programming and Operations Manual	1770-806
PLC-2/20	PLC-2/20 Programmable Controller Programming and Operations Manual	1772-802
Mini-PLC-2/15	Mini-PLC-2/15 Programmable Controller Programming and Operations Manual	1772-804
Mini-PLC-2	Mini-PLC-2 Programmable Controller Programming and Operations Manual	1772-821
PLC-2	PLC-2 Programmable Controller User's Manual	1772-800
PLC	PLC Programmable Controller Programming and Operations Manual and PLC Programmable Controller Program Panel Interface Module Operating Instructions	1774-800 1774-817
Series 7100 CNC	Programmable Interface User's Guide	7100-4.2
Series 8200 CNC	Programming Manual (2-axis Lathe) Programming Manual (Mill) Robot User's Manual	8200-5.2.1 8200-5.2.3 8200-5.2.4

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General Information

The Data Cartridge Recorder is a portable, light-weight, recording device. The recorder is used to load user programs into and record the contents of memories of Allen-Bradley PLC, PLC-2 Family, PLC-3 and PLC-4 Programmable Controllers; and Series 7100 and Series 8200 Computerized Numerical Controllers, and Series 8200 Robot Control.

NOTE: Although programs can be duplicated from one tape to another, Allen- Bradley does not recommend this practice because there is no verification of programs when you duplicate the program. If an error occurs during the duplication, you may not be able to load the tape.

There are several reasons for recording a user program, including:

- Providing a dependable back-up to processor memory.
- Allowing off-line storage for multiple programs, including diagnostic programs.



WARNING: Never use diagnostic programs when the processor is on line. Unintended machine motion may occur causing possible equipment damage and/or injury to personnel.

- Providing a source or valid record when temporary modifications to a program are required.
- Allowing identical programs to be used on several machines.

Series B data cartridge recorders may also transmit and receive programs in the manual mode. In this mode, all control lines are disabled. Data is transmitted over a 3-conductor cable.

The manual mode of operation makes the recorder compatible with both the XL2 and XL3 translator packages.

Refer to publication 6004-800 for use with the XL2 translator package. Refer to publication 6005-800 for use with the XL3 translator package.

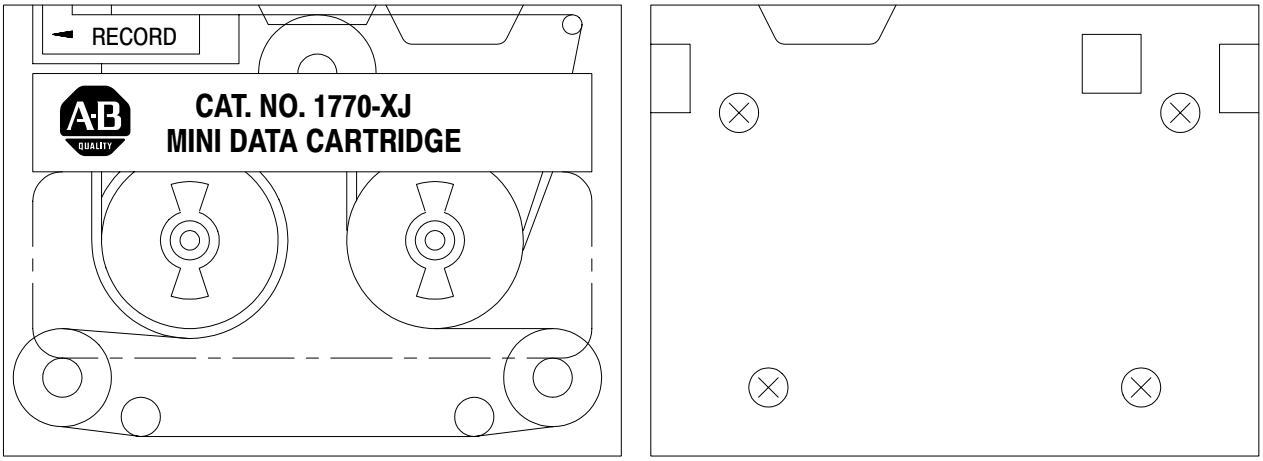
Data Cartridge

The data cartridge recorder uses the Allen-Bradley Mini Data Cartridge (cat. no. 1770-XJ). The mini data cartridge is shown in figure 1.1. It is a 2-track magnetic tape storage medium. Each track stores 72K words (max) (K-1024). Compatible tapes must conform to ANSI X3.48-1977.

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The contents of the mini-data cartridge can be protected using the RECORD tab (Figure 1.1). If the tab is positioned to the right, the tape is protected. If the tab is positioned to the left, the tape is unprotected and can be recorded on.

Figure 1.1
Mini Data Cartridge



Marking Tapes

When a program is recorded, you should mark the following information on the blank data cartridge information label provided with each cartridge.

- Tape name
- file name
- Program identification
- Processor identification
- Memory size
- Data table size
- Date

If multiple programs are recorded on one data cartridge, this information must be supplied for each program. List programs in the order that they appear on tape and list the track used for each program. It is important that this information be clearly marked on the data cartridge. Individuals unfamiliar with the contents of the tape will need this information to use the programs.

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Data Cartridge Repacking

Before inserting a data cartridge into the recorder, verify that the power ON/OFF switch is in the ON position. This ensures that when the cartridge is inserted, an automatic repacking operation is initiated. The repacking operation involves a fast forward to the EOT (end of tape) marker, and a fast reverse to the BOT (beginning of tape) marker. This operation improves the reliability of program recording and loading. If the power ON/OFF switch is turned on after the cartridge has been inserted, the tape will not be repacked.

Importance of Verification

Verifying that programs are properly transferred between the recorder and the processor is extremely important. A program which contains errors due to the data transfer has little value.

Errors in transmission can be caused by many factors, including loose connections, faulty cables, and electrical noise. If errors are found after loading a program into the processor memory, you have two options:

- The program can be re-loaded
- An Industrial Terminal (cat. no. 1770-T1,-T2,-T3,-T4) can be used to locate and correct the error

If errors are found after recording the contents of the processor memory, the only practical option is to repeat the record operation.

Another use of the recorder's verification feature is to check the contents of an improperly marked tape. If the suggestions of section 1.3 are followed, this should not be necessary.

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Chapter 2

Recorder Hardware

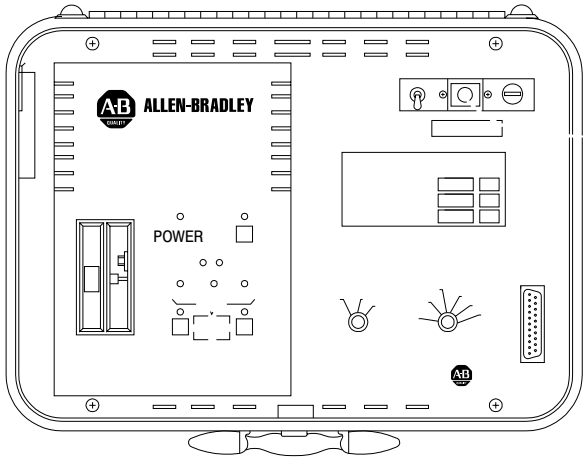
General Description

This chapter describes the various switches, indicators, connectors, and labels associated with the Allen–Bradley data cartridge recorder.

Switches

There are six switches on the recorder. Figure 2.1 shows the position of the switches on the recorder front panel. Table 2.A lists switch functions.

Figure 2.1
Data Cartridge Recorder Front Panel



10846-I

Indictors

There are ten LED indicators on the recorder. Figure 2.1 shows the position of these indicators on the recorder front panel. Table 2.B lists indicator functions.

Data Interface

The data cartridge recorder interfaces with Allen–Bradley products through a 25–pin RS–232–C connector labeled A–B CONTROLLER EQUIPMENT. This connector attaches to one end of a Cassette Recorder Interconnect Cable (cat. no. 1774– TD), or a Digital Cassette Recorder Cable (cat. no. 1772–TH).

The other end of the cable attaches to the Allen–Bradley product used with the recorder. Installation with specific products is described in chapter 3.

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Table 2.A
Data Cartridge Recorder Switches

Name	Function
POWER ON/OFF	Toggle switch. Turns recorder power on or off.
BAUD RATE	Rotary switch. Selects 300, 600, 1200, 2400, 4800 or 9600 baud operation.
TRACK SELECT	Rotary switch. Selects track 1, track 2, or continuous operation.
READ FROM TAPE	Momentary action pushbutton switch. Puts the recorder into the READ mode.
RECORD ON TAPE	Momentary action pushbutton switch. Puts the recorder into the WRITE mode.
STOP/REWIND	Momentary action pushbutton switch. Used to exit READ or WRITE mode. When the tape is stopped, the switch initiates a rewind to the Beginning Of Tape (BOT) mark.

Table 2.B
Data Cartridge Recorder Indicators

Name	Indication
POWER	Power is applies to the recorder and the toggle switch is in the ON position.
STOP/REWIND	Tape is repacking or rewinding.
BOTH TRACKS USED	TRACK SELECT switch is in CONT position and current operation (READ, WRITE or IDLE) is on track 2.
END OF TRACK	Tape has reached the end of track 1 or track 2. Illuminates between tracks and at the end of track 2 in continuous operation.
DATA IN	Recorder is receiving data.
DATA ERROR	Recorder has failed an attempted operation.
DATA OUT	Recorder is transmitting data.
RECORD ON TAPE	Recorder is in the WRITE mode.
WRITE INHIBITED	Data cartridge is protected. Data can not be recorded.
READ FROM TAPE	Recorder is in the READ mode.

230 V Fuse Kit

The data cartridge recorder includes a 230V AC fuse kit for conversion to 230V AC operation. The fuse kit includes:

- Instructions for converting to 230V AC operation
- A 230V, 0.25A fuse
- A 230V AC label

The recorder does not come with a 230V AC power cord. Therefore, the power cord must be changed for 230V AC operation.

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Chapter 3

Installation

General

PLC programmable controllers connect directly to the data cartridge recorder. Other Allen-Bradley products connect to an Industrial Terminal System (cat. no. 1770-T1,-T2,-T3,-T4), or a 1770-T12 programmer which provides the interface with the recorder. This section describes both types of installation. Table 3.A shows the cables used to connect the recorder to other Allen-Bradley products.

Table 3.A
Cables for Connecting the Data Cartridge Recorder to Other Allen-Bradley Products

Product Connected to the Data Cartridge Recorder	Cable	Cat. No.
PLC	Cassette Recorder Interconnect Cable	1774-TD
Industrial Terminal System	Digital Cassette Recorder Cable	1772-TH
PLC-4 Microtrol	Digital Cassette Recorder Cable	1772-TH
Digital Cassette Recorder	Digital Cassette Recorder Cable	1772-TH
PLC-4 Microtrol	Digital Cassette Recorder Cable	1772-TH
Series 8200 CND	Cassette Recorder Interconnect Cable	8200-CS

Connection to PLC Programmable Controllers

Use the following procedure to connect the recorder to PLC programmable controllers (Figure 3.1).

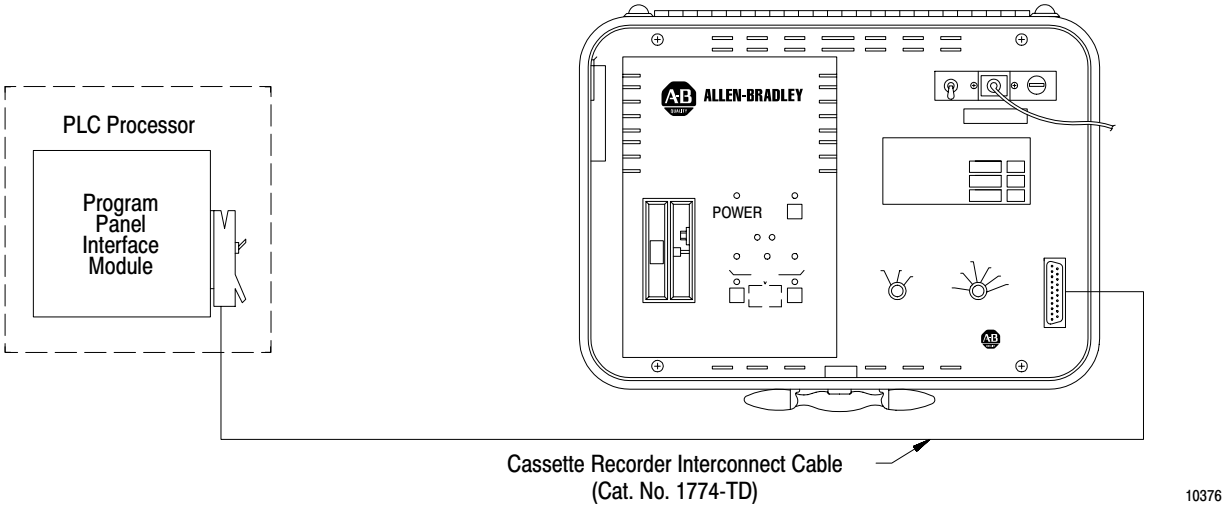
1. Connect the power cable between the recorder and a grounded 115V AC outlet.

NOTE: If the recorder has been converted to 230V AC operation, use a 230V AC outlet.

2. Connect a Cassette Recorder Interconnect Cable (cat. no. 1774-TD) between the recorder and the PLC programmable controller. Connect the end labeled CASSETTE to the connector labeled A-B CONTROLLER EQUIPMENT on the recorder. Connect the 41-pin connector to the Program Panel Interface Module (cat. no. 1774-TB, -TB2) or the On-line Programming Module (cat. no. 1774-TL2).

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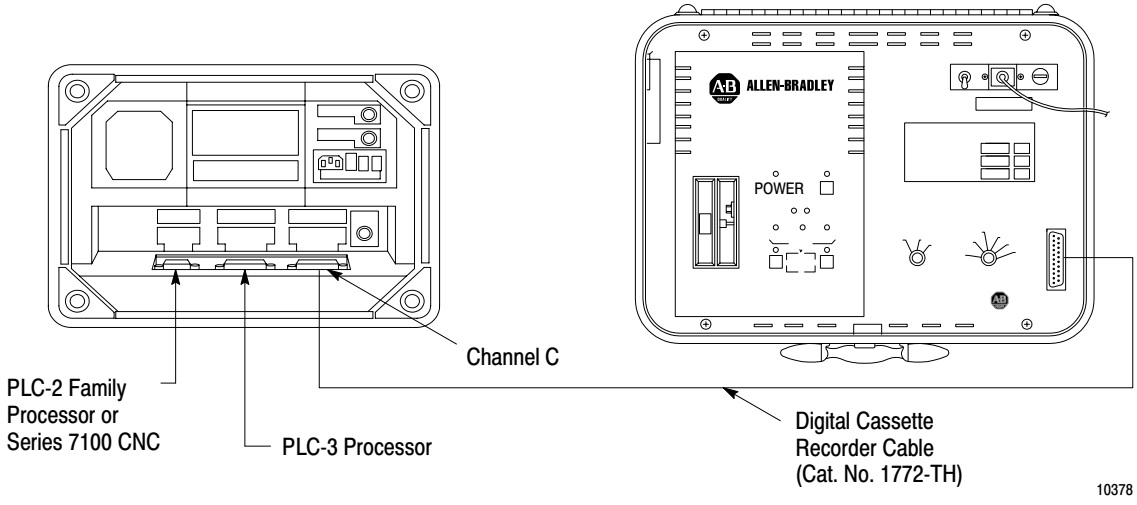
Figure 3.1
Connection to a PLC Programmable Controller



Connection to PLC-2 Family and PLC-3 Programmable Controller and Series 7100 CNCs

PLC-2 Family and PLC-3 programmable controllers and series 7100 CNCs require an industrial terminal system connected between the controller and the recorder. Connect the industrial terminal system to the controller as described in the Industrial Terminal Systems User's Manual, publication 1770-805. Connect the recorder to the industrial terminal system using the following procedure (Figure 3.2):

Figure 3.2
Connection to an Industrial Terminal System



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1. Connect the power cable between the recorder and a grounded 115V AC outlet.

NOTE: If the recorder has been converted for 230V AC operation, use a 230V AC outlet.

2. Connect a Digital Cassette Recorder Cable (cat. no. 1772-TH) between the recorder and the industrial terminal system. Connect the end labeled CASSETTE to the connector labeled A-B CONTROLLER EQUIPMENT on the recorder. Connect the other end to the connector labeled CHANNEL C on the industrial terminal system.

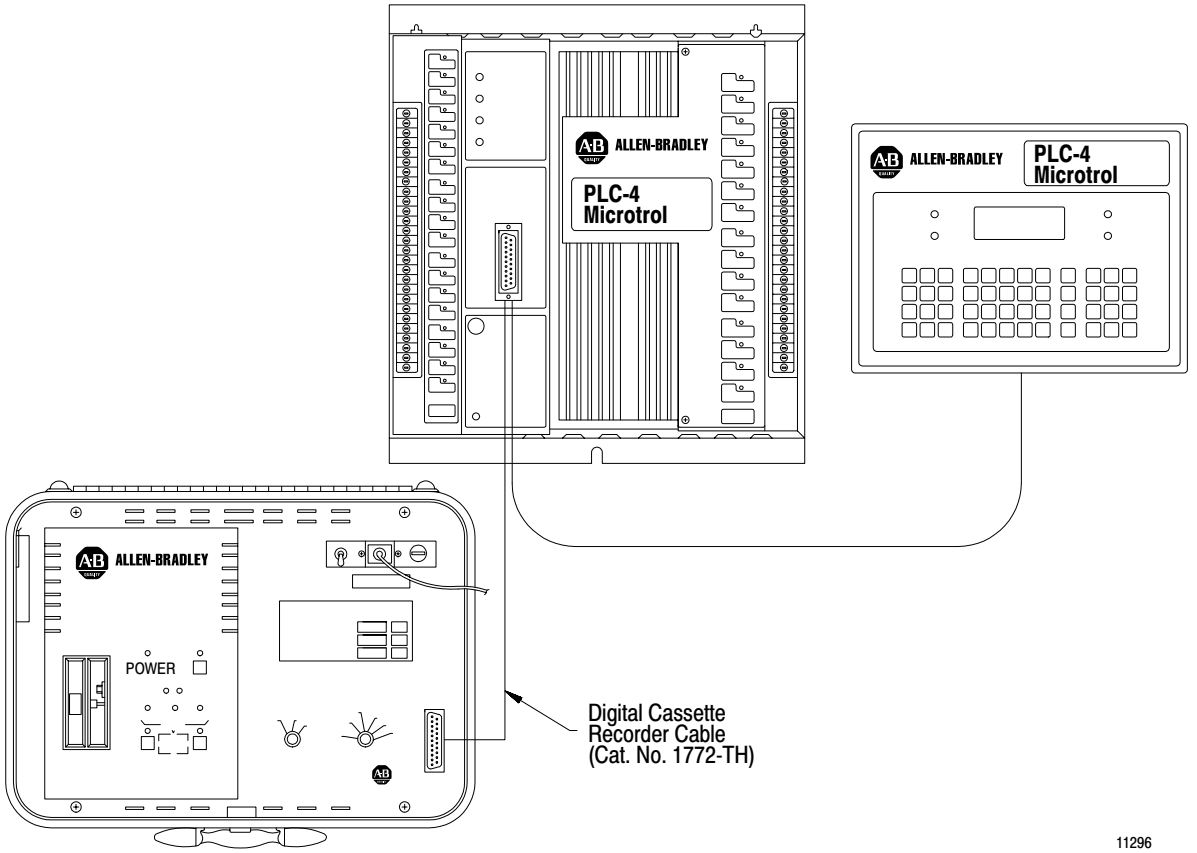
Connection to PLC-4 Microtrol Programmable Controllers

Use the following procedure to connect the recorder to PLC-4 Microtrol programmable controllers (Figure 3.3).

1. Connect the power cable between the recorder and a grounded 115V AC outlet.

NOTE: If the recorder has been converted for 230V AC operation, use a 230V AC outlet.

Figure 3.3
Connection to a PLC-4 Microtrol Programmable Controller



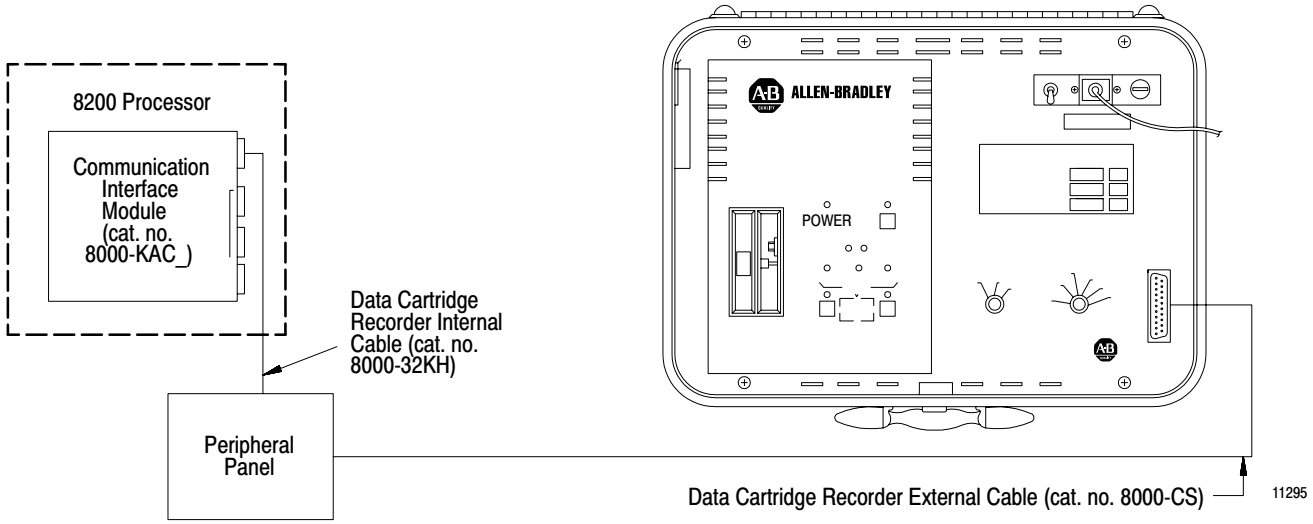
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2. Connect the 1770-T12 programmer to the PLC-4 Microtrol programmable controller as described in the PLC-4 Microtrol Programmable Controller Product Guide (publication 1773-800).
3. Connect a Digital Cassette Recorder Cable (cat. no. 1772-TH) between the recorder and the unused connector on the 1770-T12 programmer cable. connect the end labeled CASSETTE to the connector labeled A-B CONTROLLER EQUIPMENT on the recorder. Connect the other end to the unused connector on the 1770T12 Programmer cable.

Connection to Series 8200 CNCs

Use the following procedure to connect the recorder to series 8200 CNCs (Figure 3.4):

Figure 3.4
Connection to a Series 8200 CNC



1. Connect the power cable between the recorder and a grounded 115V AC outlet.

NOTE: If the recorder has been converted for 230V AC, use a 230V AC outlet.

2. Connect cable 8000-CS between the recorder and the Series 8200 control. Connect one end of the cable to the recorder connector labeled A-B CONTROLLER EQUIPMENT.

Connect the other end of the cable to the peripheral panel port labeled SERIAL 1/TAPE PUNCH if the control is a standard Series 8200 control. If the control does not have a peripheral panel, connect the cable to Port A of the communication module. If the control is a Series 8200 robot version, connect the other end of the cable to the port labeled CARTRIDGE.

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3. Set the control's baud rate of 9600 baud. The baud rate can be changed by altering the bits of PAL table 161, index 0. Change bits 2,1,0 to a value of 1,1,0. Do not alter the other bits in index 0 as they control the communications between the control and its peripheral devices. if the executive tape being used does not have PAL edit capabilities, you will not be able to change or set the control baud rate. If you do not have this capability, contact the OEM and request the change.

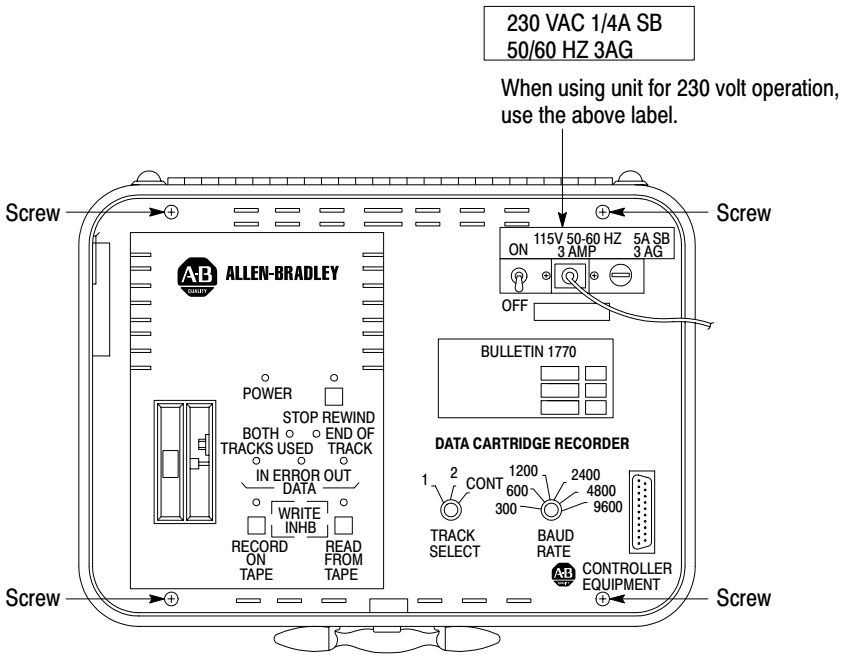
Converting for 230 V AC Operation

Use the following procedure to convert the recorder for 230V AC operation:

WARNING: Power must be moved from the recorder before converting for 230V AC operation. Performing the conversion with power applied to the recorder may cause serious injury to personnel.

1. Remove the power cord from the recorder and the grounded AC outlet.
2. Remove the four screws which attach the front panel to the case (Figure 3.5).
3. Disconnect the ground wire from the bottom of the front panel.

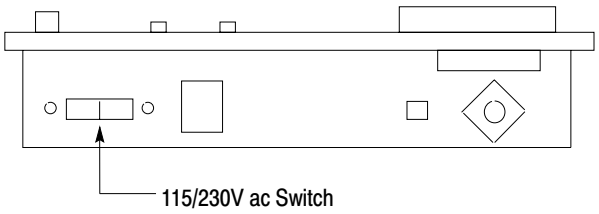
Figure 3.5
Converting to 230V Operation



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4. Remove the front panel from the case.
5. Position the switch on the power supply (Figure 3.6) to the position labeled 230.
6. Reconnect the ground wire and front panel.
7. Replace the fuse with a 0.25A slow blow 3AG fuse (included in the 2130V AC fuse kit).
8. Place the 230V AC label over the existing voltage label (Figure 3.5).
9. Replace the power cord or modify it for 230V AC operation by replacing the plug.

Figure 3.6
Power Supply Switch Position



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Chapter 4

Operation

General

The data cartridge recorder can be used to record programs at anytime. However, to provide a backup which contains proper data for startup, it is advisable to record the program before the process is started (while the processor is still in the program load mode). This chapter describes the steps required to operate the recorder with other Allen-Bradley products. Table 4.A summarizes the baud rate switch settings.

Table 4.A
Baud Rate Switch Settings

Processor	Baud Rate Switch Position
PLC	1200
PLC-2 Family	1200
PLC-3	9600
PLC-4 Microcontrol	1200
Series 7100 CNC	1200
Series 8200 CNC	9600

NOTE: In most applications the data cartridge recorder is used in the same manner as the Digital Cassette Recorder (cat. no. 1770-SA).

Manual Mode

Use the data cartridge recorder in the manual mode allows the recorder to be compatible with the XL2 and XL3 translator packages. In the manual mode all control lines are disabled. Data is transferred and received through a 30- conductor cable. XON and XOFF protocol provides data synchronization.

1. To send data to the data cartridge recorder under manual control, press the RECORD ON TAPE pushbutton. The tape advances and the STOP/REWIND indicator lights. When the tape stops, the STOP/REWIND indicator goes out and the RECORD ON TAPE indicator lights.
2. Press the RECORD ON TAPE switch a second time. The recorder will transmit a XON character to indicate it is ready to receive data. Start the data transmission to the cartridge recorder. If the data transmission is interrupted the recorder will issue a XOFF character. When data can again be sent a XON character will be transmitted. The DATA IN indicator will light whenever data is entering the recorder.

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3. After the required data has been entered into the recorder, you can exit the manual mode by pressing the STOP/REWIND pushbutton. You must press the STOP/REWIND pushbutton a second time to rewind.
4. To transmit data from the data cartridge recorder under manual control, press the READ FROM TAPE pushbutton. The tape advances and the STOP/REWIND indicator lights. When the tape stops the STOP/REWIND indicator goes out and the READ FROM TAPE indicator lights.
5. Press the READ FROM TAPE switch a second time (Receipt of XON after second time will also start transmission) and third time, the DATA OUT indicator lights as the data is sent from the recorder. After the data has been transferred, press the STOP/REWIND pushbutton to exit the manual mode.

If you press the READ FROM TAPE pushbutton during any read operation, or the RECORD ON TAPE pushbutton during any record operation, regardless of how the operation was initiated, the Series B recorder will enter the manual mode. The only indication of this will appear at the end of the operation, you will not be able to rewind the data cartridge. To exit the manual mode, press the STOP/REWIND pushbutton.

CAUTION: : The equipment discussed in this document is not designed to operate with a data cartridge recorder in the manual mode. Therefore, if the recorder enters the manual mode, the program may not be transmitted correctly. when this occurs, be sure to verify that the program has been transmitted correctly. If you are using a Series 8200 CNC, repeat the entire operation.

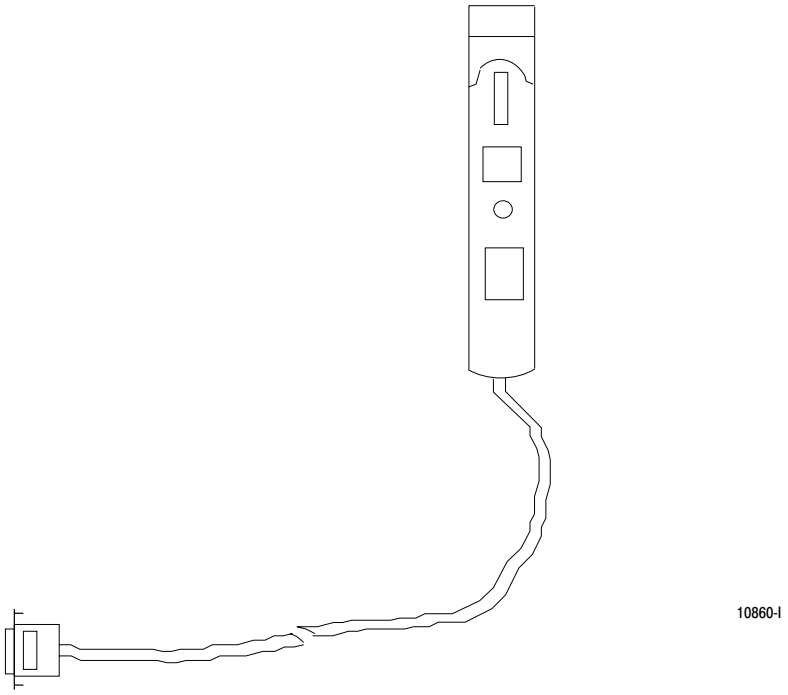
Recording PLC Programs

Use the following procedure to record programs from PLC memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Set the switch on the Cassette Recorder Interconnect Cable (cat. no. 1774-TD) to the VERIFY AND RECORD position (Figure 4.2).
7. Press the RECORD ON TAPE pushbutton.

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Figure 4.1
Error Indicator



8. Wait for the RECORD ON TAPE indicator to turn on, then off.
9. Press the STOP/REWIND pushbutton.
10. Wait for the tape to completely rewind.
11. Press the READ FROM TAPE pushbutton.
12. Wait for tape motion to stop.
13. If the ERROR indicator (Figure 4.2) on the program panel interface module or the on-line programming module illuminates, repeat the record operation.
14. When finished recording, remove the data cartridge and position the record protect tab to the right.

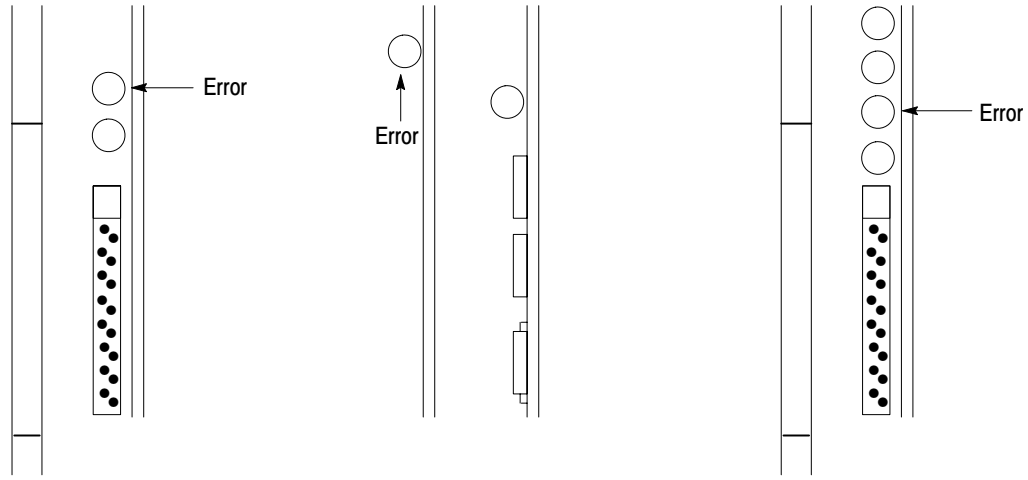
Loading PLC Programs

Use the following procedure to load a recorded program into PLC memory.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch on the ON position.
4. Insert a data cartridge into the recorder.

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Figure 4.2
Error Indicator



5. Wait for the recorder to complete the repacking operation .
6. Verify that the size of the switch-selected data table in the PLC memory is a least as large as the data table in the recorded program.
7. Verify that the total memory capacity of the PLC programmable controller is large enough to store the recorded program.
8. Set the mode select keyswitch of the PLC to the PROGRAM LOAD position.
9. Set the switch on the cassette recorder interconnect cable to the LOAD position.
10. Press the READ FROM TAPE pushbutton.
11. Wait for the READ FROM TAPE indicator to turn on, then off.
12. Press the STOP/REWIND pushbutton.
13. Set the switch on the cassette recorder interconnect cable to the VERIFY AND RECORD position.
14. Press the READ FROM TAPE PUSHBUTTON.
15. If the ERROR indicator on the program panel interface module or the on-line programming module illuminates, either locate and correct the errors or repeat the load operation.

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Verifying PLC Programs

Procedures for recording and loading include steps for verifying programs. Verification is done by the PLC programmable controller. If using a cat. no. 1774-TB, series B revision C or earlier program panel interface module, do not attempt to verify the tape after data table values have had a chance to change. With later modules, the data table is checked only if it has not had a chance to change, allowing you to verify the program at any time by using the following procedure:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Set the switch on the cassette recorder interconnect cable to the VERIFY AND RECORD position.
7. Press the READ FROM TAPE switch on the recorder.
8. Wait for the READ FROM TAPE indicator to turn off and the tape to stop.
9. If errors are found, the ERROR indicator on the program panel interface module or the on-line programming module illuminates.

Recording PLC-2 Family Programs

Use the following procedure to record PLC-2 family programs:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Place the cursor on the first program instruction.
7. Press [RECORD][0]on the industrial terminal keyboard.
8. Press the RECORD ON TAPE pushbutton.
9. Wait for the RECORD ON TAPE indicator to turn off and for the tape to stop.
10. Press the STOP/REWIND pushbutton.

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11. Wait for the tape to completely rewind.
12. Press the READ FROM TAPE pushbutton.
13. If errors are indicated on the CRT, repeat the record operation.
14. When finished recording, remove the data cartridge and position the record protect tab to the right.

NOTE: If using a 1770-T3 industrial terminal system, steps 7-12 can be replaced by pressing [RECORD][SHIFT][B] on the keyboard.

Loading PLC-2 Family Programs

Use the following procedure to load a recorded program into the memory of PLC-2 Family programmable controllers.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Verify that the memory capacity and data table size of the controller are large enough to accept the program.
7. Set the mode select switch on the controller to the PROG position.
8. Place the cursor on the first program instruction (if replacing an existing program).
9. Press [RECORD][0] on the industrial terminal keyboard.
10. Press the READ FROM TAPE pushbutton on the recorder.
11. Wait for the READ FROM TAPE indicator to turn off and for the tape to stop.
12. Press the STOP/REWIND pushbutton on the recorder.
13. Wait for tape motion to stop.
14. Press the READ FROM TAPE pushbutton on the recorder.
15. If errors are indicted on the CRT, either repeat the load operation or locate and correct the errors.
16. If an error message appears, type [SEARCH][9] to display the number of errors found.
17. If the number of errors is 19 or less, the location of each error found can be displayed by typing [SEARCH] followed by the number of

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the error. For example, the first error found is displayed after [SEARCH][0][1] is typed, while the fifth error found is displayed after [SEARCH][0][5] is typed.

NOTE: If using a 177-T3 industrial terminal system, steps 9-14 can be replaced by pressing [RECORD][SHIFT][A] on the keyboard.

Verifying PLC-2 Family Programs

The procedures for recording and loading include steps for verifying the programs. you can also verify programs at other times by using the following procedure:

NOTE: The data table is compared only on the first verification, and only if the mode select keyswitch is left in the PROG position. If it is not necessary to verify the data table, the mode select keyswitch can be in any position.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Place the cursor on the first program instruction.
7. Press [RECORD][1] on the industrial terminal keyboard.
8. Press the READ FROM TAPE switch on the recorder.
9. Wait for the READ FROM TAPE indicator to turn off and the tape to stop.
10. If errors are found, a message will appear on the industrial terminal CRT monitor.

NOTE: If using a 1770-T3 industrial terminal system, steps 7-9 can be replaced by pressing [RECORD][SHIFT][C] on the keyboard.

Recording PLC-3 Programs

You can record all or part of the user accessible memory of a PLC-3 programmable controller by using PLC-3 extended addressing. Five tape commands are used: A, Y, U, N, and E. The functions of these commands follow:

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[A] - Causes the area shown on the industrial terminal CRT monitor as the CURRENT ADDRESS to be recorded on tape. If the prompt DUMP SYSTEM is displayed, and no CURRENT ADDRESS is shown, all user accessible memory is recorded.

[Y] - Causes the next lower level of memory to be displayed as the CURRENT ADDRESS.

[U] - Causes the next higher level of memory to be displayed as the CURRENT ADDRESS.

[N] - Advances the CURRENT ADDRESS one number at the same level.

[E] - Used to end files and to verify the tape.

Following are procedures for recording all user accessible memory and for recording the user's program and assistance (HELP) messages only. Other areas of memory are recorded in a similar manner.

Recording All User Accessible Memory

Use the following procedure to record accessible PLC-3 memory.

NOTE: The mini data cartridge is limited to 144K words of data.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to the continuous (CONT) position.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Type [D][U][M][P][ENTER] on the industrial terminal keyboard.
7. Respond to prompts for tape and file names.
8. Respond to the prompt DUMP SYSTEM by typing [A][ENTER] on the industrial terminal keyboard.
9. Wait for the RECORD ON TAPE indicator to turn off and the tape to stop.
10. Type [E][ENTER] on the industrial terminal keyboard.

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11. When finished recording, remove the data cartridge and position the record protect tab to the right.

A detailed discussion of the PLC-3 extended address system appears in the PLC-3 Programmable Controller Programming Manual (publication 1775-801).

Recording The User Program and Assistance (HELP) Messages

Use the following procedures to record the user program (area E4) and assistance (HELP) messages (area E5.15) of PLC-3 memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to the continuous (CONT) position.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Type [D][U][M][P][ENTER] on the industrial terminal keyboard.
7. Respond to prompts for tape and file names.
8. Respond to the prompt DUMP SYSTEM by typing [Y][ENTER] on the industrial terminal keyboard. CURRENT ADDRESS = E3 and the prompt ENTER TAPE COMMAND are displayed on the industrial terminal CRT monitor.
9. Type [N][ENTER] on the industrial terminal keyboard. The CURRENT ADDRESS change to E4.
10. Type [A][ENTER] on the industrial terminal keyboard. Wait for the CURRENT ADDRESS to change to E5.
11. Type [Y][ENTER] on the industrial terminal keyboard. The CURRENT ADDRESS changes to E5.1.
12. Type [Y][ENTER] on the industrial terminal keyboard. The CURRENT ADDRESS changes to E5.1.1.
13. Type [N][ENTER] on the industrial terminal keyboard four times. The CURRENT ADDRESS changes to E5.1.5.
14. Type [A][ENTER] on the industrial terminal keyboard. The CURRENT ADDRESS changes to E.5.1.6.
15. Type [E][ENTER] on the industrial terminal keyboard twice to end the file, verify the tape, and exit the record function.

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16. When finished recording, remove the data cartridge and position the record protect tab to the right.

Loading PLC-3 Programs

Use the following procedure to load a recorded program into PLC-3 memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to the continuous (CONT) position.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Place the PLC-3 in the PROGRAM LOAD mode.
7. Type [L][O][A][D][ENTER] on the industrial terminal keyboard.
8. If tape and file names are known respond to prompts for them. Otherwise press [ENTER] and allow the recorder to process the tape and file names and display them on the industrial terminal CRT monitor.
9. Respond to the prompt APPEND? by typing [Y][ENTER] on the industrial terminal keyboard to add the recorded information to existing information in memory or by typing [N][ENTER] on the industrial terminal keyboard to replace the existing information with the recorded information.

NOTE: If the file contains memory area 2 (module status) you must select append.

10. If another file is to be loaded, respond to the next prompt with the next file name.
11. After all files are loaded, type [E][ENTER] on the industrial terminal keyboard.

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Verifying PLC-3 Programs

The procedures for recording and loading include steps for verifying the programs. you can also verify programs at other times by using the following procedure:

NOTE: The data table is compared only on the first verification, and only if the PLC-3 programmable controller is left in the PROGRAM LOAD mode. If it not necessary to verify the data table, the PLC-3 programmable controller can be in any mode.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to the continuous (CONT0 position.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Type [C][O][M][P][ENTER] on the industrial terminal keyboard.
7. Wait for the READ FROM TAPE indicator to turn off. If errors are found, a message will appear on the industrial terminal CRT monitor.

Recording PLC-4 Microtrol Programs

Use the following procedure to record programs from PLC-4 Microtrol memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Type [AUX FUNC] 40 on the 1770-T12 programmer.
7. Wait until the 1770-T12 programmer displays the message:

TAPE RECORDING
COMPLETE

8. Type [CLEAR] on the 1770-T12 programmer to terminate the load function.
9. When you finish recording, remove the data cartridge and position the record protect tab to the right.

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Loading PLC-4 Microtrol Programs

Use the following procedure to load a recorded program into PLC-4 Microtrol memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Type [AUX FUNC] 41 on the 1770-T12 programmer.
7. Wait until the 1770-T12 programmer displays the message:

TAPE LOADING
COMPLETE

8. Type [CLEAR] on the 1770-T12 programmer to terminate the load function.

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Verifying PLC-4 Microtrol Programs

Use the following procedure to verify that a recorded program matches the program in the memory of the PLC-4 Microtrol programmable controller.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the On position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Type [AUX FUNC][4][2] on the 1770-T12 programmer.
7. Wait until the 1770-T12 programmer displays the message:

TAPE VERIFY
COMPLETE

8. Type [CLEAR] on the 1770-T12 programmer to terminate the verify function.

Recording Series 7100 CNC Programs

When recording Series 7100 CNC programs through an industrial terminal system, use the following procedure:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .
6. Place the mode select switch on the programmable interface (PI) module in the LOAD (up) position.
7. Place the cursor on the first program instruction.
8. Press [RECORD][0] on the industrial terminal keyboard.
9. Press the RECORD ON TAPE pushbutton.
10. Wait for the RECORD ON TAPE indicator to turn off and for the tape to stop.
11. Press the STOP/REWIND pushbutton.
12. Wait for the tape to completely rewind.

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13. Press the READ FROM TAPE pushbutton.
14. If errors are indicated, repeat the record operation.
15. When finished recording, remove the data cartridge and position the record protect tab to the right.

NOTE: If using a 1770T3 industrial terminal system, steps 8-13 can be replaced by pressing [RECORD][SHIFT][B] on the keyboard.

Loading Series 7100 CNC Program

When loading Series 7100 CNC programs, use the following procedure:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. set the power ON/OFF switch to the On position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Place the mode select switch on the programmable interface (PI) module in the LOAD (up) position.
7. Press [RECORD][0] on the industrial terminal keyboard.
8. Press the READ FROM TAPE pushbutton on the recorder.
9. Wait for the industrial terminal CRT monitor to display the prompt REWIND TAP AND PRESS READ FROM TAPE/PLAY.
10. Press the STOP/REWIND pushbutton on the recorder.
11. Wait for tape motion to stop.
12. Press the READ FROM TAPE pushbutton on the recorder.
13. If errors are indicated, either repeat the load operation or locate and correct the errors.
14. If an error message appears, type [SEARCH][9] to display the number of errors found.
15. If the number of errors is 19 or less, the location of each error found can be displayed by typing [SEARCH] followed by the number of the error. For example, the first error found is displayed when [SEARCH][0][1] is typed, while the fifth error found is displayed when [SEARCH][0][5] is typed.

NOTE: If using a 1770-T3 industrial terminal system, steps 7-12 can be replaced by pressing [RECORD][SHIFT][A] on the keyboard.

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Verifying Series 7100 CNC Programs

The procedures for recording and loading include steps for verifying the programs. you can also verify programs at other times by using the following procedure:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 1200 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.
6. Place the cursor on the first program instruction.
7. Press [RECORD][1] on the industrial terminal keyboard.
8. Press the READ FROM TAPE switch on the recorder.
9. Wait for the READ FROM TAPE indicator to turn off and the tape to stop.
10. If errors are found, a message will appear on the industrial terminal CRT monitor.

NOTE: If using a 1770-T3 industrial terminal system, steps 7-9 can be replaced by pressing [RECORD][SHIFT][C] on the keyboard.

NOTE: The data table is compared only on the first verification, and only if the mode select keyswitch is left in the PROG position. If it is not necessary to verify the data table, the mode select keyswitch can be in any position.

Recording Series 8200 CNC Part Programs

You can record Series 8200 CNC part programs that are stored in main memory or punched tape on the data cartridge recorder. The program to be recorded does not have to be active at the time of the data transfer.

Recording Part Programs from Memory

Use the following procedure to record programs from the control's memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.

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4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operations.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard: CS, CY, name, CA]. "Name" is the program name in memory.
8. Wait for the RECORD ON TAPE indicator to turn on. After a short delay the DATA IN indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

NOTE: If the recorder stops unexpectedly and either the DATA IN or RECORD ON TAPE indicator is on in addition to the ERROR indicator, turn the recorder off and then on again. Press the READER RESET key. Repeat the recording operation.

9. When finished recording, remove the data cartridge and position the record protect tab to the right.

Recording Part Programs from Punched Tape

Use the following procedure to record programs stored on punched tape:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Position the tape containing the program to be copies on the tape reader. Bypass the man-readable leader.
7. Select the KYBD (keyboard) mode.

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8. Enter the following command through the keyboard: CA, TA, name]. “Name” is the name the program is to be stored under on the cassette.
9. Wait for the RECORD ON TAPE indicator to turn on, then off. After a short delay the DATA IN indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

NOTE: If the recorder stops unexpectedly and either the DATA IN or RECORD ON TAPE indicator is on in addition to the ERROR indicator, turn the recorder off and then on again. Press the READER RESET key. Repeat the recording operation.

10. When finished recording, remove the data cartridge and position the record protect tab to the right.

Reading Series 8200 CNC Part Programs

Programs stored in the data cartridge recorder can be transferred to either a Series 8200 control’s memory, to a tape punch, or to a CRT.

A mini-data cartridge may contain more than one program. you can advance the tape and skip over programs that are not presently needed. Use the following to advance the tape:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert the desired data cartridge.
5. Wait for the recorder to complete the repacking operation.
6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard: CA, SK, xx]. Replace symbol”xx” (1 to 99) with the number of programs to be skipped over.
8. After the tape advances, the selected program is ready for additional operations.

NOTE: If you need to rewind the cartridge, simply select the KYBD (keyboard) mode and enter the command: CA, RW]. The cartridge will rewind automatically. You can also rewind the cartridge by pressing the recorder’s STOP/REWIND pushbutton.

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Transferring Part Programs to Memory

Use the following procedure to load a recorded program into the Series 8200 CNC's memory:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert a data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard; CS, CA, name]. "Name" is the program name the program is to be stored under in memory.
8. Wait for the READ FROM TAPE indicator to turn on. After a short delay the DATA OUT indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

NOTE: If the recorder stops unexpectedly and either the DATA OUT or READ FROM TAPE indicator is on in addition to the ERROR indicator turn the recorder off and then on again. Press the READER RESET key. Repeat the loading operation.

9. If the error indicator turns on during program transfer, program data has been altered. you must repeat the loading operation.

Transferring Part Programs to a Tape Punch

Use the following procedure to transfer a recorded program from a recorder to a tape punch:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert the data cartridge into the recorder.

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5. Wait for the recorder to complete the repacking operation

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Connect a tape punch to the Series 8200 CNC's peripheral panel's tape punch port.
7. Select the KYBD (keyboard) mode.
8. Enter the following command through the keyboard: CA, CY, name]. "Name" is any program name or number.
9. Wait for the READ FROM TAPE indicator to turn on. After a short delay the DATA OUT indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

NOTE: If the recorder stops unexpectedly and either the DATA OUT or READ FROM TAPE indicator is on in addition to the ERROR indicator, turn the recorder off and then on again. Press the READER RESET key. Repeat the loading operation.

10. If the ERROR indicator turns on during program transfer, program data has been altered. you must repeat the loading operation.

Transferring Part Programs to a CRT

Use the following procedure to transfer a program from the data cartridge recorder to the CRT display screen.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert the data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while the tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard: CA, TT, name]. "Name" is any program name or number.

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8. Wait for the READ FROM TAPE indicator to turn on. After a short delay the DATA OUT indicator turns on.

Wait for tape motion to stop. Both indicators should be off. Only the first page of Part Program data will be displayed. Press XMIT to see subsequent pages. READ FROM TAPE and data out may come on again.

NOTE: If the recorder stops unexpectedly and either the DATE OUT or READ FROM TAPE indicator is on in addition to the ERROR indicator, turn the recorder off and then on again. Press the READER RESET key. Repeat the loading operation.

9. If the ERROR indicator turns on during program transfer, program data has been altered. you must repeat the loading operation.

Recording Series 8200 CNC PAL Programs

PAL (programmable applications logic) programs may be stored on a data cartridge. Binary formatted PAL programs of either the B or C type may be recorded through the data cartridge recorder.

If an error is detected while the PAL program is being loaded, the recorder will stop and an error message will be displayed on the CRT.

Recording a B Version PAL Program

Use the following procedure to store a B version PAL program on the data cartridge recorder:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert the cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard: AL, PN, B,CA].
8. Wait for the RECORD ON TAPE indicator to turn on. After a short delay the DATA IN indicator turns on.

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Wait for tape motion to stop. Both indicators should be off.

9. Remove the data cartridge and position the record protect tab to the right.

Recording a C Version PAL Program

Use the following procedure to store a C version PAL program on the data cartridge recorder:

1. Install the recorder as described in chapter 3.

2. Set the BAUD RATE switch to 9600 baud. Set the TRACK SELECT switch to track 1 or track 2.

3. Set the power ON/OFF switch to the ON position.

4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert the cartridge into the recorder.

5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.

7. Enter the following command through the keyboard: AL,PN,C,CA].

8. Wait for the RECORD ON TAPE indicator to turn on. After a short delay the DATA IN indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

9. Remove the data cartridge and position the record protect tab to the right.

Loading Series 8200 CNC Pal Programs

Use the following procedure to load a PAL program from a data cartridge into the control's memory:

1. Install the recorder as described in chapter 3.

2. Set the BAUD RATE switch to 9600 baud. Select the track containing the desired program.

3. Set the power ON/OFF switch to the ON position.

4. Insert the data cartridge into the recorder.

5. Wait for the recorder to complete the repacking operation.

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NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Select the KYBD (keyboard) mode.
7. Enter the following command through the keyboard: AL,RL,CA].
8. Wait for the READ FROM TAPE indicator to turn on. After a short delay the DATA OUT indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

Recording Series 8200 CNC Executive Programs

Use the following procedure to record executive programs from the control's memory.

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Set the TRACK switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure that the write protect tab on the data cartridge is positioned to the left, and insert the cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Halt the processor.
7. Select and clear the P-register.
8. Set the P-register to octal 6.
9. Press STORE.
10. Press PRESET.
11. Press RUN.
12. Enter the following command through the keyboard: PC]. If only a position of memory is to be stored enter the command: PC, start, end]. "Start" and 'end" are the memory addresses between which the data is located.

NOTE: If PC] or PC, ST, END] gives a * indication, the executive does not have cartridge capability.

13. Wait for the RECORD ON TAPE indicator to turn on. After a short delay the DATA IN indicator turns on.

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Wait for tape motion to stop. Both indicators should be off.

NOTE: If the recorder stops unexpectedly and either the DATA IN or RECORD ON TAPE indicator is on in addition to the ERROR indicator, turn the recorder off and then on again. Press the READER RESET key. Repeat the recording operation.

14. If the error indicator turns on during program transfer, program data has been altered. you must repeat the recording operation.
15. Remove the data cartridge and position the record protect tab to the right.

Loading Series 8200 CNC Executive Programs and PAL Binary Programs

Use the following procedure to load an executive program from data cartridge:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.
4. Insert the data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation .

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will be altered.

6. Half the processor.
7. Select and clear the S-register.
8. Set the DATA SELECT switch to the CASSETTE position. If your system is not equipped with this switch, set the S register to octal 30000. If the AMP-generated area of the program is to be protected, set the S register to 34000.
9. Press STORE.
10. Press PRESET.
11. Press BBL.
12. Wait for the READ FROM TAPE indicator to turn on. After a short delay the DATA OUT indicator turns on.

Wait for tape motion to stop. Both indicators should be off.

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After a successful program load the switch register should display octal 102077.

Recording Series 8200 AMP or Diagnostics Utility Programs

1. Install the recorder as described in chapter 3.
2. Set the baud rate switch to 9600 baud. Set the track switch to track 1 or track 2.
3. Set the power ON/OFF switch to the ON position.
4. Be sure the write protect tab on the data cartridge is positioned to the left, and insert the cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind operation is in progress, the data on the tape will altered.

6. Half the processor.
7. Position the AMP utility or diagnostic tape on the tape reader. Bypass the man-readable leader.
8. Press BBL.
9. After the tape has finished loading, position the cartridge bootstrap program tape on the tape reader. This tape is included in 8000 UR or 8000 URZ options. Bypass the man-readable leader.
10. Press BBL.
11. Set S-Register to 1 (octal) to transfer the AMP utility program and diagnostics to the cartridge.
12. Set the P-Register to 076000 (octal).
13. Preset PRESET.
14. Press RUN. The selected AMP or Diagnostic utility program will be copied onto the data cartridge.

Load AMP From Cassette to 8200 CNC

Use the following procedure to load AMP from the data cassette to the 8200.

1. Install the recorder as described in chapter 3.
2. Set the baud rate switch to 9600 baud. Select the track containing the desired program.
3. Set the power ON/OFF switch to the ON position.

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4. Insert the data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a rewind operation is in progress, the data on the tape will be altered.

The following procedures assume that all information to be loaded is contained on a data cartridge.

6. Load the executive program into the 8200 CNC using the procedures outlined in Loading Series 8200 CNC Executive Programs and PAL Binary Programs. Set the DATA SELECT switch to the CASSETTE position. If your system is not equipped with this switch, set the S-register to 34000 (octal).
7. Wait for tape motion to stop. Both the READ FROM TAPE and DATA OUT indicators should be off. After a successful program load, the 8200 processor switch panel will display 102077 (octal). Do not press the RUN button.
8. Place the AMP utility program into the cartridge recorder.
9. Wait for the recorder to complete the repacking operation .
10. Halt the processor.
11. Set the S-register to 34000.
12. Press STORE.
13. Push PRESET.
14. Press BBL.
15. Wait for tape motion to stop. Both the READ FROM TAPE and DATA OUT indicators should be off. After a successful program load, the 8200 CNC processor switch panel will display 102077 (octal).
16. Press RUN. The AMP utility program will begin execution.

NOTE: When you have completed entering the AMP parameters into the control, the composite executive can be loaded onto the data cartridge using the procedures outlined in Loading PLC Programs.

Load Diagnostics From Cartridge to 8200 CNC

1. Install the recorder as described in chapter 3.

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2. Set baud switch to 9600 baud. Set the track switch to the track containing diagnostics program.
3. Set the power ON/OFF switch to the ON position.
4. Insert the data cartridge into the recorder.
5. Wait for the recorder to complete the repacking operation.

NOTE: If the recorder is turned off while a tape rewind is in progress, the data on the tape will be altered.

6. Halt the processor.
7. Set the DATA SELECT switch to the CASSETTE position. If your system is not equipped with this switch, set the S-register to 34000 (octal).
8. Press STORE.
9. Press PRESET.
10. Press BBL.
11. Wait for the tape motion to stop. Both the READ FROM TAPE and DATA OUT indicators should be off. After a successful program load, the 8200 processor switch panel will display 102077 (octal).
12. Press RUN and the diagnostics will display the first question.

Erasing Series 8200 Programs

Series 8200 programs stored on a cassette may be erased so that the cassette may be re-used. use the following procedure to erase cassette programs:

1. Install the recorder as described in chapter 3.
2. Set the BAUD RATE switch to 9600 baud.
3. Set the TRACK SELECT switch to the area of the tape to be erased. Select either TRACK 1, TRACK 2, OR CONT (to erase the entire tape).
4. Set the power ON/OFF switch to the ON position.
5. Wait for the recorder to complete the repacking operation.
6. Position the recorder's cartridge head at the point from which the recorder is to erase the tape. Advance or rewind the tape as necessary.
7. Select the KYBD (keyboard) mode.
8. Enter the following command through the keyboard: CA,IZ].

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9. Wait for the END OF TRACK indicator to come on. After a short delay the ERROR indicator turns on and a rewind operation is performed. Both indicators turn off when the operation is complete.

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Chapter 5

Maintenance

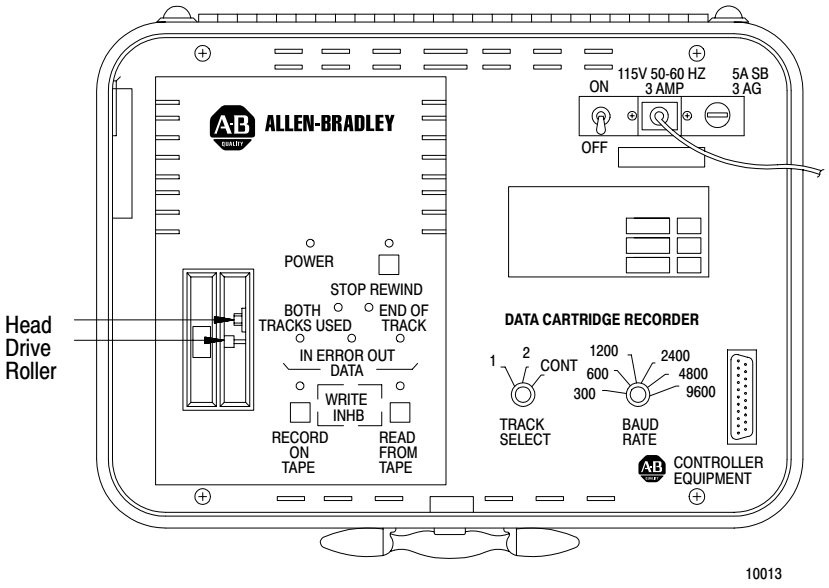
General

When the data cartridge recorder needs repair, contact your local Allen-Bradley Customer Support Services Center. Only routine preventive maintenance should be performed by the user. This section describes this preventive maintenance.

Head Cleaning

After every ten hours of operation, clean the read/record and erase heads (Figure 5.1) with cotton swabs dipped in a magnetic header cleaner solvent. Also, clean the drive roller in the same manner. Do not touch the heads with fingers or other foreign objects which may damage the head.

Figure 5.1
Data Cartridge Recorder Magnetic Heads



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Unit Cleaning

After every 100 hours of operation, clean the entire unit using the following procedure:

1. Remove the power cord from the recorder and the grounded AC outlet.
2. Remove the four screws which attach the front panel to the case.
3. Disconnect the ground wire from the bottom of the front panel.
4. Remove the front panel from the case.
5. Using an air hose (2 psi maximum pressure, clean, dry air) or a soft brush, clean the inside of the recorder.



WARNING: : To avoid eye injury, be sure to wear safety glasses when using an air hose. Loose dirt may be propelled by air currents.

6. Reconnect the ground wire and front panel.
7. Clean the heads as described in section titled Head Cleaning.

Head Demagnetizing

After every 100 hours of operation, demagnetize the read/record and erase heads.

Data Cartridge Storage

Store the data cartridge in a closed container away from dirt, heat, and magnetic fields. This helps maintain the quality of recordings and extends the life of the tape and the tape heads.

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Chapter 6

Specifications

Specifications

Power Requirements
- 115/230V AC ±10%, 50/60Hz

Data Rate
- Switch selectable 300, 600, 1200, 2400, 4800 or 9600 baud

Data Format
- 8 bit binary, serial plus 1 start bit and 1 stop bit per character

I/O Interface
- EIA RS-232-C

Transmission Mode
- Full-duplex

Bit Error Rate
- Less than 1 intermittent (soft) error in 10^7 bits
- Less than 1 unrecoverable (hard) error in 10^8 bits

Recording Density
- 800 bits per inch

Recording Head
- 2 track read-after-write (RAW) head

Data Cartridge
Cat. No. 1770-XJ
- ANSI X3.48-1977 Magnetic Tape Cassette 140 ft computer grade magnetic tape certified at 1600 FCI (flux changes per inch)

Size (H x D x W)
- 15.3 x 35.6 x 45.8 cm (6 x 14 x 18 inches)

Weight
- 6.8 kg (15 lbs)

Environmental Operating Temperature
- 0° to 50°C (+32° to 122°F)

Operating Humidity
- 20% to 80% RH non-condensing

Storage Temperature (without cartridge)
- -40° to 65° C (-40° to + 149° F)

Storage Humidity (without cartridge)
- 5% to 95% RH non-condensing

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