

CDL

AutoPilot[®]

Instruction manual for
CDL Control, Display, Logging Software
for use with the ARC-16 Remote Control System.

Includes instructions for
optional AutoPilot Software.

July 1996

BURK
TECHNOLOGY

7 Beaver Brook Rd
Littleton, MA 01460

(978) 486-0086

Copyright © 1996 Burk Technology, Inc.

Contents

Section One

INTRODUCTION

Quick Start..... 5
Description..... 5
..
What's New..... 7
Computer Requirements..... 7
ARC-16 Requirements..... 8
Warranty..... 9
..

Section Two

INSTALLATION

Hardware Installation..... 10
Software Installation..... 10
Running INSTALL..... 12
Installation..... 16
Errors.....

Section Three

SETUP

Running Setup..... 17
Quick Setup..... 18
Full Setup..... 19
Specifying Site Numbers..... 27
Editing Screen Labels..... 28

Section Four

CDL OPERATION

Quick Start..... 31
Starting the Program..... 32
Screen Description..... 32
Normal Operation..... 34
Keyboard..... 36

Section Five

AutoPilot

Control.....	
Logging.....	36
..	
Description.....	38
..	
Installing	38
AutoPilot.....	
ARCSETUP for	39
AutoPilot.....	
Running	39
AutoPilot.....	
Mode	40
Editor.....	
Mode	44
Commands.....	
How Modes	45
Work.....	
Using	49
AutoPilot.....	

<i>Appendix A</i>	ARC16.....	51
	..	
COMMAND SUMMARY	AutoPilot.....	54
	..	
	EDLABEL.....	54
	..	
	ARCSETUP.....	55
	..	
<i>Appendix B</i>	Checking the Baud	57
	Rate.....	
HARDWARE	Installing the	58
	Interface.....	
INSTALLATION	CI	59
	Connections.....	
	ESI	60
	Connections.....	
	CI	61
	Schematic.....	
	ESI Computer Interface	62
	Schematic.....	
<i>Appendix C</i>	Default Color	64
	Codes.....	
CUSTOMIZING COLORS		
<i>Appendix D</i>	ARC-	66
	16.....	
FORMS	CDL.....	67
	..	
	ESI.....	68
	..	
	Sample	69
	Form.....	
	Channel Assignment Form.....	70

Section One

INTRODUCTION

The CDL (Control/Display/Logging) system when used with a Burk Technology ARC-16 Remote Control System and your PC provides the finest transmitter control system available. We hope you'll be pleased with your decision, and we stand ready to help you get up and running as quickly as possible.

To get the most out of your system, we recommend that you read the entire manual before beginning installation. CDL offers many choices for personalizing the system. By understanding what is possible before you begin, you will save time and be assured of a perfect fit for your station.

Quick Start

If you choose to "jump in" without reading all the way through, here are a few pointers for a quick start:

The ARC-16 Demo disk contains both a demonstration and a simulator for the computer interface. You can get a good feel for the system by running first the demonstration, then trying the simulator. (References to the CI-16 on the demo disk also apply to the newer CDL program.)

Make sure that the ARC-16 system is already set up and operating correctly before installing the CDL software. Copy the form in Appendix D, and assign names to all control, metering and status functions that you intend to use, so that you can easily edit the labels in the CDL program.

Refer to Section Two for instructions on running the installation program. Do NOT copy the files directly from the disk, but instead run INSTALL as instructed. Refer to Appendix B for cable requirements before connecting the computer to the ARC-16. This is especially important if you are doing an upgrade from an earlier system, since there are some changes in the cabling and connector requirements.

Complete installation and setup instructions are included in Sections Two and Three. Following this procedure will assure a smooth installation. If you encounter difficulties, refer first to the manual, then call tech support if necessary.

Description

The CDL Control/Display/Logging system consists of a set of programs which permit control of a connected ARC-16 Remote Control System.

The programs are designed to be run on an IBM PC-XT, AT or compatible. The PC may be directly connected or may be connected via modem for remote operation.

If you have AutoPilot, the extensions for automatic control are described the AutoPilot section of this manual. This manual refers to the program as ARC16, as that is the program name which is used for either CDL or CDL with AutoPilot.

Display functions

Current meter readings and status from any site may be displayed, with user programmed control, metering and status labels for each channel. Values outside of the limits programmed in the ARC-16 are displayed in red or yellow for high and low alarms, respectively.

Status inputs that are currently active cause a user-programmed status “on” message to be displayed in a user-selected color. Status inputs that are off are displayed dimly, using a user-programmed “off” message.

The currently selected control channel is also prominently displayed.

Automatic logging

An operating log may be printed for selected channels from any connected site. Logging may be turned on and off and the logging interval adjusted from the keyboard. Dial-up users may select a logging interval which will automatically dial, connect, log and disconnect. The times will be reported on the log for all alarms that have occurred since the last call (up to four hours in the past), and a set of current readings will be recorded.

Control functions

Cursor control keys on the keyboard are used to select sites, change channels and raise or lower outputs. Single character alphabetic commands are used for system control functions.

On-screen editing

Labels for control and metering channels may be edited directly on the screen. Status on and status off messages may also be edited, as can the color of the status on messages.

What's New

CDL replaces the software previously shipped with the CI-16 computer interface. While CDL retains the same look and feel, users of Burk Technology CI-16 software will appreciate several enhancements.

A new install program, along with an improved setup program saves time and assures the user of a correct installation. Each field has context-sensitive help available, and all required data can be entered directly without the use of an editor.

Log-to-Disk, previously available only to AutoPilot users, is now standard in CDL.

The ability to automatically change from daylight to standard time and vice versa is now standard with CDL.

CDL, when used with the Model ESI Enhanced Speech Interface will now connect at 1200 baud without the use of reverse tones. Support is provided for a broad range of modems.

Computer requirements

Processor

For maximum performance, an 80286 based computer is recommended, although in most cases it is possible to run the CDL on an 8086 or 8088. AutoPilot requires a '286.

Operating system

PC-DOS or MS-DOS 3.0 or later

Memory

512K RAM is normally sufficient for the program and the operating system.

Disks

The program requires at least one 5-1/4" or 3-1/2" floppy disk. It is preferable to install on a hard disk if available. 300K of disk space is required as a minimum. Additional space may be required if logging is directed to the hard disk.

Monitor

Although the program will work with a Hercules compatible monochrome adapter and monitor, or with most CGA and EGA monitors, a VGA monitor is recommended.

Ports

A serial port (COM1 or COM2) is required for the link to the ARC- 16. An additional port (serial or parallel) is required only if direct logging is desired. Please note that COM3 or COM4 may not be used for either the ARC-16 connection or for printing.

Computer connections

The type of connection used between the computer and the ARC-16 will depend on the interface used. Please refer to Appendix B.

ARC-16 Requirements

ARC Firmware

CDL and AutoPilot version 4.5 or above will operate only with an ARC-16 which contains firmware version 4.5 or above. This can be confirmed by pressing **MODE** on the ARC-16 until the serial number and version is displayed.

Only the ARC-16 unit which contains the interface for the computer must have version 4.5 or above.

ARC version 4.5 in one ARC-16 unit will work properly with ARC version 4.4 in another unit, but not with any version 2 or 3 firmware.

Computer Interface Option

CDL and AutoPilot version 4.5 or above must be used with either a Model CI or a Model ESI interface. See Appendix B for more information.

Users upgrading from CI-16 must reset the baud rate jumper on the CI card. See Appendix B.

Warranty

Burk Technology, Inc. warrants the AutoPilot and CDL distribution diskettes to be free of defects in materials and workmanship for a period of 24 months from the date of purchase. Equipment will be repaired or replaced at the option of Burk Technology and returned freight prepaid to the customer. Damage due to abuse or improper operation or installation of the equipment or caused by fire or flood or harsh environment is not to be covered by this warranty. Damage in shipping is not the responsibility of Burk Technology. A return authorization must be obtained before returning any equipment. Materials returned under this warranty must be shipped freight prepaid and insured in the original shipping carton or suitable substitute to Burk Technology, Inc., 7 Beaver Brook Road, Littleton, MA 01460. Repairs not covered under this warranty will be made at prevailing shop rates established by Burk Technology.

THE WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BURK TECHNOLOGY SHALL NOT BE LIABLE TO ANY PARTY FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THIS EQUIPMENT.

Section Two

INSTALLATION

This section covers the installation of CDL software on your PC. Installation should not be attempted until the ARC-16 system is fully functional and all channels are assigned to the specific functions you have chosen for your plant.

A form to help you assign labels and functions for each channel is included in Appendix D, along with an explanation of each entry. Make a photocopy of the form for each channel that you are planning to use.

For best results, read this manual completely, fill out the forms for each channel, then return to this section to complete the installation.

Hardware Installation

Since CDL software can be used in several different configurations, your specific hardware requirements are determined by the exact choice of computer and remote control equipment. Please refer to Appendix B for information pertaining to your installation.

Software Installation

CDL software may be installed on as many computers as you would like, but is licensed for use with only one ARC-16 unit (although control and monitoring will be available for all sites directly linked to that unit).

To connect one computer to more than one ARC-16 unit requires a separate installation on the computer, plus a separate registration for each unit.

You might install CDL on a PC at the studio which is directly connected via RS-232, and, if you are using an ESI, on another computer with a modem. Both computers would use the same registration. The installation on one PC should be completed before beginning installation on additional computers to avoid the need to make duplicate entries. See page 17 for instructions on transferring data to a second PC.

New Installations

The procedure that follows will create a new directory on the drive of your choice, and will build a complete set of files. You will need at least 300K of free space on the drive. Skip to the Running INSTALL section.

Upgrades from Previous Versions

If you are upgrading an earlier version of CDL or CI-16, the correct procedure depends on which version is currently installed. To determine the current version, press <ALT> V while running the ARC-16 program.

If the current version is earlier than version 4, you should do a complete new installation in another directory.

INSTALL will build files in a directory containing an earlier version, but will not produce the correct results. Since several data files were extended in version 4, the original files are too short, and will produce an error when CDL attempts to load the files.

Versions 4 or later may be upgraded simply by running INSTALL as described below. Any data files you have created will be retained, provided that the dates on these files are 1-01-90 or later.

If you are upgrading a previously installed AutoPilot, run INSTALL for CDL first, then run INSTALL for AutoPilot. In both instances, be sure to specify the directory where AutoPilot was originally installed.

Since the upgraded files will be installed directly in your existing directory, you should make a complete backup of this directory before proceeding. If there is sufficient space on your hard disk, you can copy all files in this directory to a backup directory. Alternatively, you can use a backup utility (or simply copy) to make a floppy disk backup. Refer to your DOS manual for help in making a backup.

Proper operation of INSTALL depends on the DOS date being correct, since files are retained or replaced depending on the date they were created. Some files are written during editing and normal program execution, therefore always make certain that the date is correct before running any CDL program, including INSTALL. To check or change the DOS date, type *DATE* from the DOS prompt.

Running INSTALL

The installation of all required files on your computer is completed easily by following these steps:

1. Insert the CDL master diskette in any available drive on your computer.

The CDL master must not be write protected, since temporary files are created on this disk during installation.

2. Change to the selected drive by typing the drive letter followed by a colon and a return. E.g. A: <ENTER>
3. Type *INSTALL* <ENTER>

On some monitors, such as a laptop with a monochrome VGA screen, forcing the display to monochrome will improve the appearance. Do this by using the -b option (*INSTALL -b*).

```
Install for CDL and AutoPilot
-----
Target Drive   C
Directory     \CDL
-----
Installing CDL      Ver 4.5
```

4. If the default drive and directory are acceptable, you may proceed without making any changes. If you wish to select a different drive or directory, make the desired changes before proceeding. Upgrades from version 4 or above must be installed in the same directory as before to avoid reentering labels and setup information. Type in the existing drive and directory, including the initial backslash.

INSTALL will create a new directory if you specify one that does not exist. It will, however only create directories one level below an exist directory. Specifying \FOO\CDL as the desired directory will only work if \FOO already exists.

5. Press [F2] to proceed with the installation. The screen will briefly show “Ready for Install”, then files will be unpacked directly to the specified drive. If, instead, you wish to return to DOS and terminate the installation, press [F3].

If you are doing an upgrade installation, it is normal for the installation process to report that files are being skipped, since user data that has been entered previously will not be copied over.

6. Following a successful installation, The README.DOC file will be displayed. If you would like a printed copy of this file, and a printer is connected, return to DOS and type

COPY README.DOC PRN

When INSTALL is complete, your directory should contain the following files:

README . DOC

An ASCII text file which may be typed or printed. Contains supplemental information and a list of commands to run CDL programs. Is displayed automatically following INSTALL.

PRODUCT . DAT

An ASCII text file which may be typed or printed. Contains program name, version, and date of manufacture. Used by INSTALL and ARC16 programs. Should not be altered.

ARCSETUP . EXE

An executable program used to set or change system configuration, labels, dates, etc. Must be run from the directory where CDL is installed. May be removed after configuration to prevent unauthorized changes. Requires the following additional files:

ARCSETUP . QSL

DST . FRM
DISPLAY . FRM
COMSET . FRM
LOGGING . FRM
GRAPH . FRM
ACCESS . FRM
COLUMNS . FRM
TIMEZONE . FRM
HEADER . FRM
ST . FRM

EDLABEL . BAT

A batch file which sets the environment variable SETUP=1, then executes ARC16, which enables on-screen editing of screen labels. Clears SETUP variable after exit from ARC16. Must be run from directory where CDL is installed. May be removed to prevent unauthorized changes.

ARC16.EXE

An executable file which contains the main CDL program. Includes the AutoPilot extensions if AutoPilot has been installed. Must be run from the directory where CDL is installed.

TIMEZONE

A data file which contains the name of the current time zone and the date of the next time zone change. Used by ARC16 and ARCSETUP.

LOGGING

A data file which contains the name of the logging device or file. Used by ARC16 and ARCSETUP.

ARC16.CFG

A data file which contains various system configuration data such as com port, baud rate, monitor type, site names, etc. Used by ARC16 and ARCSETUP.

PRINT.CFG

A data file which retains the last set logging interval. Used by ARC16.

MODEM.DAT

A data file which contains the initialization string for the modem connected to the computer. Used by ARC16 and ARCSETUP.

STCOLOR.DAT

A data file which contains the user defined colors for status messages. Used by ARC16.

NOMINAL.DAT

A data file which contains the nominal values for the bar graph display. Used by ARC16.

STPRINT.DAT

A data file which contains the user selections for printing or not printing status messages each time status changes. Used by ARC16.

UPW.DAT

A data file which contains registration data. Used by ARC16 and ARCSETUP.

LOGCOL.LBL

A data file which contains site, channel and label information for each log column. Used by ARC16 and ARCSETUP.

CONTROL.LBL

METERING.LBL

UNITS.LBL

STATUSME.LBL

Data files which contain screen labels for control, metering, units and status messages.
Used by ARC16.

HEADER.LBL

An ASCII text file which contains the log header. Used by ARC16 and ARCSETUP.

COLORC.ODE

MONOC.ODE

BLKWHTC.ODE

Data files which contain color sets for different monitor types. Used by ARC16 and ARCSETUP.

OFFLINE.TXT

TIMEHELP.TXT

HELP.TXT

ASCII text files for pop-up windows. May be edited by user. Used by ARC16.

If this is an upgrade from a version earlier than 4.5, your directory will contain a SETUP.EXE file. This program is no longer used, and may be deleted from your directory.

After CDL has been successfully installed, proceed to Section Three to complete the configuration and setup of your system.

Re-running INSTALL

Any time you would like to restore a file to the original release version, you may delete the file, then run INSTALL again from the master disk. INSTALL will only replace missing files, and will not change the files you have edited since the last installation.

Installing CDL on another computer

Although INSTALL may be run again from the master disk to install the system on another computer, much effort will be saved by first completing the setup described in Section Three, then copying the entire directory to a floppy disk, which can be transferred to the second computer. Configuration information unique to the second computer may then be edited using ARCSETUP.

If channel labels or other data are changed in the future, it is possible to copy only the affected files. The file list above should assist in determining which files need to be copied.

Installation Errors

Normally, INSTALL will run to conclusion, building all required files, then displaying README.DOC before returning to DOS. Any error encountered during the process will be reported on the bottom line of the install screen. Possible errors encountered during installation are:

Unable to switch to specified drive and path

This error indicates that an attempt to change to the directory that was specified has failed, or that the newly named directory could not be created. Make sure that the directory is only one level below an existing directory. Also verify that the drive letter is valid.

Insufficient space on drive X

The most likely cause of this error is an attempt to write to a drive which is write-protected.

Unable to create file on master disk

Unable to open temporary file on master disk

An attempt to create or open a temporary file on the source disk has failed. Check to make sure that the master CDL disk is not write protected.

Skipped. Disk Full

During the unpacking of files, it is possible for the program to report a Disk Full condition, and skip the transfer of some files. Although the installation will appear to complete normally, the missing files will likely cause one or more of the operating programs to fail. Remove unneeded files from the drive and run INSTALL again.

Installation Terminated

This message indicates that INSTALL was aborted by the operator pressing [F3] or by an error.

Section Three

SETUP

Before CDL can be used to control and monitor an ARC-16, the ARCSETUP program must be run to enter configuration data.

Running Setup

Change to the directory where CDL is installed and type *ARCSETUP* from the DOS prompt.

On some monitors, such as a laptop with a monochrome VGA screen, forcing the display to monochrome will improve the appearance. Do this by using the -b option (*ARCSETUP > -b*).

The screen will display a menu bar across the top with instructions as follows:

```
Com Log Header Columns Display Graph TimeZone ST DST Access Quit
Set Com Port, Baud Rate, Modem, Telephone Number

Setup for CDL and AutoPilot

Use the ← → keys or type the first letter
to make a choice, then press enter.
```

The main menu appears on the first line of the menu bar. The currently selected topic will be highlighted. The second line of the menu bar will change as you scroll through the various topics, detailing the fields which are included under the currently selected topic.

Selecting a Topic

Choose a topic as directed, then press enter. The appropriate data entry screen will appear, with the default or last entered values displayed. Use <TAB>, <SHIFT TAB>, and the cursor keys to navigate on the screen.

Help

Press [F1] on any field for specific help on that field.

Saving Changes

Press [F2] to return to the main menu. If you have made any changes, you will be asked if you wish to save the changes. Type *Y* to save or *N* if you would like to retain the original values.

Alternatively, you may press [F3] to automatically save the changes to this screen and return to the main menu.

The [F3] prompt only appears on the status bar at the bottom of the screen after changes have been made to at least one field. If you have typed changes into a text field, press <ENTER> to display the [F3] prompt.

Changes may be verified by re-selecting the topic from the main menu.

Returning to DOS

To leave ARCSETUP and return to DOS, select QUIT from the main menu.

Quick Setup

If you are anxious to try CDL without performing a complete setup, skip to the following steps to do a minimum setup.

After completing these steps, verify that the hardware setup is correct, then proceed to Section Four, Operation. Logging will be disabled, the bar graph will be meaningless, and the channels will lack custom labels, but the screen will display proper readings and control of the ARC-16 will be possible.

If you encounter difficulties, read the balance of this section to understand the effect of other setup choices. You may also need to review the hardware requirements in Appendix B.

After verifying proper operation, return to this section to complete the full setup.

Topic: COM

Set the following items according to your requirements:

Com Port
Baud Rate
Modem

If a modem is being used, complete these items:

Tone or Pulse Dial
Telephone Number

Topic: LOG

Set Number of Lines per page to 0 (disables logging).

Topic: DISPLAY

Choose an appropriate color set

Topic: ACCESS

Set User Password to match the ARC-16. Leave the other fields blank.

Full Setup

Complete instructions are provided here for each field in each topic. Proceed through all topics to complete

the setup.

Topic: COM

Communications Setup		
Com Port	Com 1	Press Space to select
Baud Rate	1200	
Modem	N	Press Space to change
Tone or Pulse Dial	T	
Telephone Number	1234567	
Setup String	ATV1E0X0M1S0=2	
Press F1 for help on any field		

Com Port

Select the com port on your computer that will be used to connect to the ARC-16. Pressing <SPACE> will open a selection window. Use the up and down arrow keys to select the correct port, then press <ENTER>.

Baud Rate

Press <SPACE> to open a selection window. This setting must match the baud rate used by your ARC-16 interface. For ESI users, the choice must be 1200 baud. CI users may require 300 or 1200 baud. Refer to Appendix B for more information.

Modem

If you are using a direct connection from your COM port to the ARC-16 RS-232 connector, answer no (N). If you are using a Hayes compatible modem to connect to an ARC-16 with ESI, answer yes (Y). Press <SPACE> to toggle yes or no, then press <ENTER>.

Tone or Pulse Dial

This answer is required only if you answered yes to the modem field above. Select *T* if the computer modem will be used on a line that supports tone dialing. Select *P* if the computer must dial out using pulse dialing.

Telephone Number

This field is required only if you answered yes to the modem field above. Enter the telephone number for the line that is connected to the ARC-16. Dashes or spaces may be included for clarity but are not required. Pauses may be added at any point in the number by entering a slash (/). Do NOT enter a comma for a pause, as this will cause unpredictable results.

Users who are upgrading from an older CI-16 or AutoPilot will need to delete the `A` or `R` character at the end of the telephone number. This was used to reverse the modem tones. Starting with CDL version 4.5, it is not necessary to use reverse tones.

Setup String

This field is required only if you answered yes to the modem field above. This string is sent to reset the modem during normal execution of the ARC16 program (CDL or AutoPilot). Since the default string will work in almost all cases, you should have a specific reason to change this field.

If the setup string has been altered and you would like to restore the default value, return to the DOS prompt and delete the MODEM.DAT file, then re-run the INSTALL program, specifying the same directory. INSTALL will replace only this file, assuming no other files were deleted.

Topic: Log

Logging Setup	
Logging Device or Filename	LPT 1
Number of Channels to Log	8
Number of Header Lines	4
Number of Lines per page	0
Press F1 for help on any field	

Logging Device or Filename

The default for this field is *LPT1*. This will direct the logging output to a printer connected to LPT1. You may specify another device or a filename, including drive and path.

If a serial port is specified (COM1 or COM2) a mode statement should be added to the AUTOEXEC.BAT file to specify the correct baud rate and other RS-232 specifications for the printer. Refer to the DOS manual for further instructions on using MODE and AUTOEXEC.BAT.

If a file name is specified, logging output will not be sent to the printer, but will instead be sent to a file. If the file does not exist, one will be created. If it does exist, output will be appended to this file.

Logging may be directed to a floppy disk, in which case the user would be expected to change the disk periodically.

It is up to the user to make certain that the specified drive has sufficient space to hold the logging file. The space required depends on the number of header lines, the number of channels logged, the logging interval and the number of status events generated. Approximately 5K of disk space will be required for each full page of an 80-column log.

Number of Channels to Log

Enter the total number of channels that you would like to appear on the printed log. Each channel will appear in a separate column on the log. Each line on the log will require 14 spaces, plus 9 spaces for each channel. The maximum number of channels that may be logged is determined by the carriage width of the printer and the pitch of the type. Using compressed print and a wide carriage, a maximum of 24 channels may be logged.

Number of Header Lines

The top of each log page contains a user-defined header, which may contain station information, FCC required data such as efficiency factor, EBS notations, etc. The text to be printed in the header will be entered in the next topic. This field tells the ARC16 program how many lines of the header are to be printed. Up to nine lines may be specified.

Number of Lines per page

Enter the total number of lines to be printed on each page, including the header, log column labels and all lines of actual log data. For an eleven inch log form, up to 66 lines may be entered.

If no printer is connected, you can prevent the computer from waiting for the printer by specifying zero lines per page.

For log-to-disk, a larger value may be desired. This field will allow up to 99 lines to be specified.

Topic: Header

Enter text for the log header. The number of lines specified in "Logging" will print on each page.

Enter each line as you wish it to appear at the top of each page. Only the number of header lines specified in the previous topic will actually print, although the file may contain up to nine lines of text. Each line is 79 characters long.

Topic: Columns

Column		1		2		3		4		5		6		7		8
Site	0		1		2		3		4	0		1		2		3
Channel	1		1		1		1		16		16		16		16	
Line 1	AC LINE															
Line 2	Volts															
Units	()		()		()		()		()		()		()		()	
Column		9		10		11		12		13		14		15		16
Site	0		0		0		0		0		0		0		0	
Channel	9		10		11		12		13		14		15		16	
Line 1																
Line 2																
Units	()		()		()		()		()		()		()		()	
Column		17		18		19		20		21		22		23		24
Site	1		1		1		1		1		1		1		1	
Channel	1		2		3		4		5		6		7		8	
Line 1																
Line 2																
Units	()		()		()		()		()		()		()		()	

This screen, although daunting at first glance, is actually quite simple, since each set of five fields is the same for every log column. It is only necessary to complete entries for as many channels as you wish to log. Reference to a completed set of forms from Appendix D will greatly simplify your work on this screen.

The first eight columns will also be the eight bars of the bar graph which is displayed by the ARC16 program. This dictates that the column assignments should be chosen carefully to include the most important functions in the first eight columns.

Site

Logging channels may be selected from any connected site. Enter a number from 0 to 3 to indicate the site from which this channel will be logged.

Site numbers are relative to the site where the computer is connected to the ARC-16. Refer to Specifying Site Numbers on page 32 to make certain you are selecting the proper site.

Channel

Indicate the channel number to be logged in this field.

Line 1

Enter the first line of the label for this column.

Line 2

Enter the second line of the label for this column.

Units

Enter the unit of measurement for this column (watts, volts, etc.).

Topic: Display

CRT Display Options	Color Set Default Site	COLOR 0	For help Press [F1]
Site Labels	Site 0 Site 1 Site 2 Site 3	Local ARC-16 B Site C Site D Site	

Color Set

Press <SPACE> to open the selection window. For CGA, EGA, VGA or Super VGA monitors, select COLOR. For monochrome monitors, select MONO. Better results may be obtained on some LCD displays by selecting BLKWHT. Feel free to experiment to obtain the best display for your monitor.

Although the colors for each type of display have been carefully chosen to be suitable on a wide range of monitors, you may have specific requirements which require additional customizing. Appendix C includes instructions for altering the colors on a detailed basis.

Default Site

Enter a number from 0 to 3 to control which site is automatically displayed when the ARC16 program is started.

Site numbers are relative to the site where the computer is connected to the ARC-16. Refer to Specifying Site Numbers on page 32 to make certain you are selecting the proper site.

Site Labels

Site labels are displayed on each page of the display and on the printed log. Typically, the call letters or a description such as “XMTR or STUDIO” might be used. This entry only affects the text printed or displayed. It does not actually assign the site to a site number.

To prevent a site page from being available (e.g. for an unused site), enter a dash (-) as the first character of the site label and delete all remaining characters in the field.

Topic: Graph

Nominal Values for Bar Graph	
Bar 1	2151
Bar 2	2373
Bar 3	2301
Bar 4	2055
Bar 5	2141
Bar 6	10.9
Bar 7	258
Bar 8	115
Press F1 for help	

Recall that the first eight log channels as specified in the Columns topic will also appear on a bar graph which may be displayed on the screen. Each bar will be scaled so that when the associated metering channel is at the nominal value specified here, the bar will meet the “barber pole” near the right side of the screen.

For each bar, enter the nominal value for the associated channel. Refer to your completed forms and to the Columns topic to determine the correct values. These values may be entered as floating point numbers; the decimal point is significant, but does not have to appear in the same position as on the ARC-16.

Topic: TimeZone

Time Zone Selection	
Current Time Zone	EST
Next Time Change	00-00-1900 2:00 AM

Current Time Zone

Press <SPACE> to open the selection window. Choose the time zone you are currently using. The selected time zone will appear on the screen and on the logs.

If your time zone does not appear in the selection window, you may still alter the time zone by manually editing the file TIMEZONE to display the proper letters. (Use EDLIN or, in DOS 5 or above, EDIT.) Exercise care to leave all the characters in exactly the same position. The time zone must be exactly three characters, and the middle character must be 'S' or 'D'.

Next Time Change

Enter the date (MM-DD-19YY) for the next change to or from daylight savings time. If a standard time is selected in the previous field (e.g. EST), the time will advance one hour when the date entered is reached. If a daylight time is selected (e.g. EDT), the time will be set back one hour.

The change is made by directly setting the DOS clock at 2:00AM on the date specified.

If 00-00-1900 is entered in this field, no time change will take place.

To enter this value, ignore the range error warning and press F3 to save the change. It is up to the user to set the date for the next time change after a change occurs. This may be done at any time, from the first day after the change up until the day before the next change.

Certain add-on computer clock boards also reset the time on the proper date. To avoid a double correction, you must use only one method. We recommend using CDL to change the time, since that will permit the proper data to be displayed and logged.

Topic: ST

Topic: DST

These screens are for AutoPilot only, and may be ignored in CDL.

Topic: Access

The User Password must be entered by all users. New systems will operate for at least 30 days with a blank screen label and authorization. To register, call (508) 433-9626 during normal business hours. Press 3 for service, then tell the operator that you would like to register CDL or AutoPilot. You will need the serial num- ber of your ARC-16.
Access Codes
ARC-16 Serial # User Password 0000 Screen Label Authorization
Press F1 for help on any field

The access screen is used to enter the user password and registration information.

ARC-16 Serial

The serial number as displayed on the ARC-16 should be entered in this field. This number will be required for registration.

To determine the serial number on the ARC-16, press MODE repeatedly until the display shows the version and serial number.

This number will generally be the same as the number on the rear of the ARC-16 chassis. In some cases, especially where the ARC-16 firmware has been updated, the number may be different. It is the number on the display that should be entered here.

User Password

All users must enter the user password exactly as shown on the ARC-16. If the user password is changed on the ARC-16, run ARCSETUP again, and change the password to match.

To determine the user password on the ARC-16, access the configuration menu and press <MODE> repeatedly until the display shows MASTER-USER. The user password is the second four digits (the digits directly under the word USER). See the ARC-16 manual for details.

Screen Label

This field should be left blank until your CDL system is registered. When you are ready to register the system, enter a label that will be displayed on the screen and all logs. This label becomes part of the registration code and can not be changed without getting a new registration.

Authorization

When you are ready to register your CDL system, follow the instructions on the screen to obtain an authorization code. Enter the code exactly as received in this field.

Your CDL system will operate for at least thirty days from the date received with a blank screen label and authorization. Until an authorization is received, it is important that these fields be left blank. Any characters in these fields will cause the system to stop.

If you are uncertain of the age of your CDL disk, enter *TYPE PRODUCT.DAT* <ENTER> at the DOS prompt. The date manufactured will provide an indication of the age of the disk. Disks are always shipped with a grace period beyond thirty days. If your disk is well beyond that date, you should call to immediately register CDL.

Topic: Quit

Choose Quit to return to the operating system.

Specifying Site Numbers

It is important to understand the difference between site numbers and site letters.

Site letters are used as the absolute site identifier within an ARC-16 system. They are assigned during the initial ARC-16 setup, and normally do not need to be changed.

Sites are identified by numbers in CDL program and are relative to the unit which is connected to the computer. For this reason, site numbers will relate to different site letters, depending on where the computer is connected. (This seemingly indirect approach is made necessary by the need to send and store data from several sites over many possible links in a multi-site system.)

Site 0 is always the local site (i.e. the site which contains the computer interface being used). Site 1 is the next higher letter, with letter 'D' "rolling over" to 'A'. Site 2 is the next higher letter, then site 3.

The following table helps to illustrate this relationship. Remember, Site 0 is always the site where the computer interface is located.

Site 0	Site 1	Site 2	Site 3
A	B	C	D
B	C	D	A
C	D	A	B
D	A	B	C

For example, if the computer is connected to the studio which happens to be site D, and the transmitter is site A, then, from the table, all data pertaining to the transmitter site should be entered as site 1. If instead the transmitter were designated C, CDL would expect to find the transmitter data as site 3.

If access to an ARC-16 system is available through more than one computer interface (e.g. a CI at the studio and an ESI at the transmitter), a separate directory will be necessary for each. The site numbers will be different in each directory, and it will be necessary to rebuild the label files.

Editing Screen Labels

Before entering the screen labels as described here, it may be useful to refer to the screen description on page 38 to gain an understanding of the purpose for each label. The site selection section on page 41 will also apply.

Screen labels may be edited during normal program operation whenever the SETUP environment variable is set to 1. After editing the labels it is advisable to reset this variable to prevent unauthorized changes. The setup environment variable is automatically turned on and off by running the EDLABEL batch file.

During normal program execution you can determine if label editing is permitted by pressing the right arrow cursor key. If a label becomes highlighted, editing is enabled. Pressing the right arrow will do nothing if editing is not enabled.

Starting EDLABEL

To run the EDLABEL batch file, make certain that you are in the directory where CDL is installed and type

EDLABEL <ENTER>

at the DOS prompt. The program will start as normal, but editing is now enabled.

Selecting a Label

To select a label to edit, use the cursor keys to highlight the desired label. The up and down cursor keys will move through the channels, and the left and right cursor keys will select control, metering, units or status.

With the desired label highlighted, press *E* to edit. The lower portion of the screen is used for editing. A help window will appear with the available editing commands.

```
—Edit—  
Enter new text for label.  
Enter a space to delete label.  
  
Escape = Leave Edit without  
saving changes.  
Return = Save changes to label.  
  
Edit "control 1          " =
```

Type in a new label, following the instructions in the EDIT help window.

If *E* doesn't appear to do anything, it is possible that you have the channel number highlighted instead of a user defined label.

Editing Status Messages

The status messages are a little more complicated, since there are several ways CDL can handle status conditions.

After using the left and right arrow keys to select a status message to edit, press *E* to see the following on the lower screen:

```
Enter new label for status OFF. To edit status ON condition, press right arrow.  
ALT-P to toggle printing  
  
Edit "OFF          " =
```

The first statement indicates that the message to be displayed for the OFF condition has been selected for editing. The message can be set to blank so that the status field only displays something when the status is ON.

In addition to entering the text for the OFF message, you may select whether changes to this status channel should be used to generate a message on the log. ALT P will toggle printing. The current selection is displayed at the bottom of the status column.

Editing Status ON

If you want to edit the message for the ON condition, press the right arrow cursor key. The lower screen will now display this editing area:

```
Enter new label for status ON. To edit status OFF condition, press left arrow.
To change status ON color, press Up and Down arrows.  ALT-P to toggle printing

      Edit " ON                      " =
```

This is almost like the Status OFF editing, except that you now have the addition of a color choice for the Status ON message. Use the Up and Down arrow cursor keys as prompted on the screen and observe the actual affect on the text displayed. Each color is available as blinking or non-blinking. Press the cursor keys repeatedly to see all possible combinations.

Disabling Label Editing

When finished editing, use <ESC> to exit the program. The EDLABEL batch will automatically clear the SETUP environment variable and return to the DOS prompt.

Customizing Help Text

When the [F1] key is pressed, a help window appears.

```
— HELP —
To display another screen: press PageUp or PageDn

To select command channel: press up or down, Home, End, or
                           number of desired channel.

To issue commands: Raise = hold Ctrl and press right-arrow.
                   Lower  = hold Ctrl and press left-arrow.

— Press Any Key To Exit Help —
```

The text for this window is in the HELP.TXT file and may be customized by the user using EDLIN, EDIT or any editor or word processor in non-document (ASCII text) mode. The size of the window is fixed.

To restore this window to the original text, delete HELP.TXT and run INSTALL again from the master disk.

Proceed to Section Four, Operation after completing this section.

Section Four

CDL OPERATION

Before running the ARC16 program, you must run INSTALL as described in Section Two, and perform at least the minimum setup described in Section Three. The ARC-16 should be connected, either directly to the computer or to a phone line.

Quick Start

For maximum benefit from the CDL program, you should read through this section carefully. If you'd like to jump ahead to try the program, the following Quick Start will get you going. You may refer back to this section if you have questions.

1. Change to the directory where CDL is installed.
2. Type *ARC16* <ENTER>The default site will be displayed.
3. Use the up and down cursor keys to highlight a channel.

A command may be sent to the ARC-16 by pressing <CTRL> plus the left or right arrow key.

Caution: The command will actually be sent to the ARC-16. Do not send a command unless you are certain that the channel will not affect normal station operation.

4. Press <PAGE UP> or <PAGE DOWN> to browse through the available sites. One of the pages will be a bar graph, which will display data only if the first eight logging channels have been assigned.
5. To exit the program to complete the setup or make changes, press <ESC>

Starting the Program

The main CDL program is contained in the ARC16.EXE file. From the operating system, change to the disk or directory containing the program and files and type

ARC16 <ENTER>

The default site will be displayed as shown here.

```
11-02-93                      FM Transmitter                      13:06:10 EST

CONTROL                        METERING                      STATUS
1  Fil ON/OFF                  FM Filament                    00.00 Volts      FM Filament Off
2  Plate ON/OFF                FM Plate E                     0.001 K Volts   FM Plates Off
3  Power Trim                  FM Plate I                     0.001 Amps
4  Power Trim                  FM Power FWD                   00.00 K Watts   * CARRIER OFF *
5  Pwr Transfer                FM AC Line V                   240.4 Volts     Power from Mains
6  Generator                   Gen Line V                     000.0 Volts     Generator Idle
7  Stereo/Mono                 Stereo Mon                      100.0 Percent   Stereo
8  Audio Proc                  Audio Input                     100.0 Percent   Optimod
9  Aux Fil                      Aux Fil                        00.00 Volts     Aux Filament Off
10 Aux Plate                    Aux Plate E                    0.001 K Volts   Aux Plate Off
11 Aux Pwr Trim                 Aux Plate I                    0.001 Amps
12 Aux Pwr Trim                 Power FWD                      00.00 K Watts   Tower Lights Off
13 De-Icers                    Temperature                     030.8 Deg. F    De-Ice Off
14 Ant MAIN/AUX                FM Pwr FWD                     00.00 K Watts   Antenna on Main
15 O'Load RESET                Ant Pwr REFL                   00.00 K Watts
16 Dummy Air                    Dummy Load                     00.00 K Watts   Dummy Air Off

LOGGING                        AutoPilot is OFF              COMMANDS                      STATUS
(C)=Change Logging            (A) = Turn Auto On           (F1) = Help                  Logging: Disabled
(H)=Print Log Title           (M) = Edit Mode              (ESC)ape = Exit              Not Connected
(L)=Print Log Line
```

Screen Description

Each site is displayed on a separate page similar to this one. The screen is divided into several areas:

Title Bar

The top line of the screen includes the current date, time, time zone and the site label for the selected site.

Channel Column

The first column at the far left of the screen indicates the channel numbers from 1 to 16.

Control Column

The second column contains the user defined control functions for each channel. The currently selected channel will be highlighted.

<p>All user defined screen labels are edited using EDLABEL, described in Section Three, Setup.</p>

Metering Columns

The center columns contain metering information for the selected site. Column three is the user defined label for the metering function.

The actual reading for this channel is displayed and constantly updated in the fourth column. A number in this column will be highlighted if the channel is above or below the limits set on the ARC-16 (if limits monitoring is on).

The next column displays the user defined units for each channel.

Status Column

User defined status messages are displayed in the last column. OFF messages are displayed dimly on a color monitor. ON messages are displayed in a user-defined color and may be programmed to blink.

The bottom of the screen contains system information which is updated according to the current state of the CDL and ARC-16 system.

Logging Block

Logging commands and the required keypress are displayed in the Logging block in the lower left corner of the screen.

AutoPilot Block

This section indicates the presence of the AutoPilot extensions and whether AutoPilot is turned on or off. See the AutoPilot manual for more information.

Commands Block

This section of the screen contains command information to help the user remember commonly needed command keys. If the system is ready to accept commands, the command key combinations are displayed in this block.

The commands are blanked when they are not available. Commands will not be displayed when the selected site is in the maintenance mode. "MAINTENANCE MODE" will instead be displayed in the command block.

If a modem is being used to connect to the ARC-16, this block will display the available dialing command prompts, switching to the raise/lower commands only when the system is connected and ready to accept these commands.

Status Block

Logging and Modem status are displayed in this block. The currently selected logging interval is displayed, as well as the type and status of the ARC-16 connection. During a modem connect, this block will echo the messages from the modem so that the progress of the connection can be monitored.

Normal Operation

Help

A help window is available during normal operation by pressing [F1]. The command block contains a reminder that this key is available should help be required.

This text may be customized. Refer to Section Three, Setup for more information.

Establishing a connection

The status block indicates whether and how the system is connected. If there is no current connection, the block will display "NOT CONNECTED". If the system is directly connected and running, the display will indicate "LOCAL CONNECTION".

A connection by modem may be completed from the computer to the ARC-16 in one of three ways:

- 1) by pressing (D)ial, which will call the ARC-16 and remain connected until <ESC> is pressed,
- 2) by pressing (L)ine, which will call, collect the current data, print one line, then hang up, or
- 3) by defining a log interval greater than 1 minute, which will automatically call, log, and hang up at the defined interval.

Calls from ARC-16 to Computer

If a modem is installed, the CDL program may be set to answer calls. Pressing *T* toggles ANSWER ENABLED and ANSWER DISABLED, as displayed in the STATUS block.

When ANSWER is enabled, if the ARC-16 detects an alarm condition and is programmed to call the computer, CDL will answer the call and perform the following steps:

- 1) Direct the modem to send an answer carrier.
- 2) Acknowledge the originate carrier from the ARC-16.
- 3) Send password and authorization information to verify that this is a valid call.
- 4) Request alarm reports from the ARC-16.
- 5) Print the alarm reports to the log output, including the actual time each alarm occurred up to four hours ago.
- 6) Receive a complete set of current values from all connected sites.
- 7) Print a log line with the current time and data.
- 8) Disconnect and reset the modem.

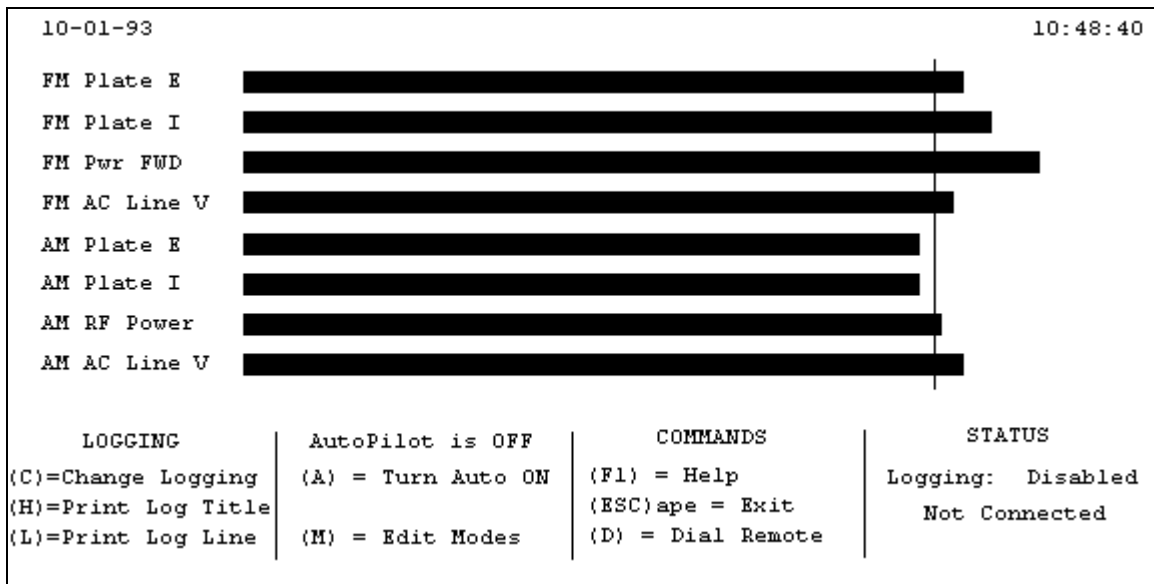
Site Selection

Select the desired site by pressing <PAGE UP> or <PAGE DOWN>. Each site is displayed on a separate page with the name of the site in the title bar.

Since data from all sites is constantly being updated in memory, changing to a new site will display all current readings instantly.

If a dial-up modem connection is used to connect to the ARC-16, the data displayed will be current as of the last connection.

Bar Graph Display



One page contains a bar graph with a bar for each of eight channels selected from any site. The vertical line at the right of the page (referred to as a "barber pole" because of its appearance on a color monitor) represents the nominal value for that channel. Each bar is scaled to that value, so that all bars should be at the line if all values are exactly equal to the specified nominal value.

A bar extending to the right of the barber pole indicates a value that is higher than normal.

On a color monitor, the bars are normally green. If a channel exceeds the high limit specified in the ARC-16, the bar will turn red. Values below the low limit will be yellow.

If the channels for display are chosen carefully and the nominal values entered accurately, the bar graph provides a very useful display for an operator, especially where more than one site is being monitored.

To make adjustments in response to an out of tolerance condition, the operator should use <PAGE UP> or <PAGE DOWN> to return to the appropriate site page and enter commands as necessary.

Keyboard Control

Channel selection

Metering and status values are displayed constantly for all channels at the selected site, so no channel selection is necessary to obtain readings.

For control, it is necessary to highlight the desired channel.

This can be accomplished in several ways. The up and down arrow keys allow you to browse through the channels. <HOME > jumps to channel 1 and <END> jumps to channel 16. You may also type the number of the desired channel or, if <NUM LOCK> is on, you may directly enter the channel number using the numeric keypad.

Raise/Lower Commands

To issue a command, first select the desired channel as described above. The selected channel will be highlighted on the display. Now hold down the control key and press the left or right arrow keys for lower or raise, respectively. On a color monitor, the channel activated last will display in yellow (lower) or red (raise) until another channel selection is made.

Raise/lower commands are sent for approximately 1.5 seconds. It is not necessary to hold the key down for the command to be sent. If a longer closure is desired, as may be the case when adjusting power, you may hold the key down as long as desired.

Logging

Control of the automatic logger is by a set of single-character commands that may be entered at any time.

Logging Interval

The log may be updated at intervals from 1 minute to 3 hours. Pressing *C* will change the interval or turn the print output off completely. Note that the logging will occur on the cardinal times. That is, if three hours is the selected interval, the log will print at midnight, 3AM, 6AM, etc., regardless of when the program was started or the selection was made. The last logging time is displayed on the screen below the current time.

In addition to the timed outputs, the log will print whenever a status condition changes or an alarm occurs on a logged channel.

<p>Individual status channels may be inhibited from generating a logging output. This is useful for frequently activated status signals that would generate unnecessary log entries. See Section Three, Setup for more information.</p>
--

Header

Pressing *H* will cause a page to eject and a new header will be printed. This is not necessary during normal operation, since headers are automatically printed at the top of each log, but does allow you to clear the log and start a new page at any time.

Line

Type *L* to print an immediate line on the log. The most recent values will be printed.

Brackets around an analog reading on the printed log signify that the reading is outside the limits as defined in the ARC-16. That's all there is to running CDL. To help you remember the commands, a quick reference command summary is included in Appendix A.

Section Five

AUTOPILOT

Description

AutoPilot is an optional software package which may be installed on any computer on which CDL is already installed.

AutoPilot provides an extensive set of automatic control features which are designed to help you maintain tight control of your plant with a minimum of effort.

Each user-defined function is described as a mode. There are sixty possible modes, each of which may contain up to nineteen steps.

Modes may be defined to control power, change pattern, switch to an auxiliary transmitter, or just about anything else that can be described in a flow chart.

Modes may be activated by a change in status or value, or may be activated by time or keypress. Time may be expressed as a fixed time or as a specially defined time such as sunrise and sunset. A table stores these times for the whole year, with four defined times for each month. A second table stores the times for daylight savings time as well.

The modes are defined using a “point and shoot” mode editor, making entry a snap, even for computer novices.

A tutorial is provided, with step-by-step instructions for completing a functioning mode. In addition, several typical modes are presented as templates for your own modes.

Installing AutoPilot

Whether you are doing a brand new installation or an upgrade, CDL must be installed and set up before installing AutoPilot. If you do not have CDL running at this point, return to Sections Two and Three.

An INSTALL program is included on the AutoPilot master diskette. Run INSTALL, following the directions in Section Two. Be sure to install AutoPilot in the same directory where CDL is installed.

Your directory will now contain the following additional files:

AE . EXE

The mode editor for AutoPilot. Normally invoked by pressing *M* in the ARC16 program, but may be started from DOS by typing *AE <ENTER>*.

ATS . DAT

A data file containing all of the modes created by AE. Used by ARC16.

ATS.MSG

A text file containing all of the user-defined messages for display and logging. Edited in AE and used by ARC16.

ATS.NAM

A text file containing all of the mode names. Created by AE. Used by ARC16.

SCHEDULE.ST**SCHEDULE.DST**

Text files which contain the pre-sunrise, sunrise, sunset and post-sunset times for standard time and daylight savings time, respectively. Edited with ARCSETUP. Used by ARC16.

ARCSETUP for AutoPilot

All of the setup required for AutoPilot should already have been done using ARCSETUP for CDL (Section Three), with the exception of the sunrise/sunset files and AutoPilot registration.

AutoPilot Registration

As with CDL, AutoPilot must be registered within 30 days. The authorization code for AutoPilot will be different from the CDL authorization code. If you have not yet registered CDL and intend to run AutoPilot, you may register AutoPilot without registering CDL. If you intend to run both, you will need both registrations.

Setting Sunrise/Sunset Times

Change to the directory where AutoPilot is installed and type *ARCSETUP* from the DOS prompt. Select the ST topic and enter the monthly times for the four events.

It is only necessary to enter times for the events you will be using. Normally, refer to the station license for the correct times.

Now return to the menu and select the DST topic. Note that the times for this file must be entered in daylight savings time, so add an hour to the times listed on your license.

Running AutoPilot

AutoPilot is started in exactly the same way as CDL. In fact, the AutoPilot INSTALL program replaced the ARC16.EXE program. All of the original CDL functions are present, but now the program includes the AutoPilot extensions for automatic control.

To start AutoPilot, change to the directory where AutoPilot was installed and type *ARC16* <ENTER>.

The screen will look exactly the same, except for the AutoPilot block at the bottom of the page.

AutoPilot Status

The AutoPilot block at the bottom of the screen indicates whether AutoPilot is on or off. Pressing *A* will toggle the status. When AutoPilot is on, automatic functions will run according to the instructions in the user-defined modes. When AutoPilot is off, ARC16 runs just like CDL.

Mode Editor

Starting the Mode Editor

The AutoPilot status block also displays a reminder that the mode editor may be entered by pressing *M*.

The mode editor makes extensive use of the labels defined by the user in the ARC16 program, and uses the site labels defined in ARCSETUP. It is important to complete these assignments before attempting to use the mode editor.

The mode editor is used to enter instructions for automatic execution. During mode editing, the normal ARC16 program is suspended. It may be re-started automatically when mode editing is completed.

Main Menu

```
File Run Mode Name Type Init Copy Edit Quit
Load, Save or Print modes
```

When the mode editor is first started, a menu appears at the top of the screen. The first line indicates the available topics. The second line provides the choices available or the functions performed when the highlighted topic is chosen. Change to the desired topic by pressing the first letter of the topic, or browse the topics using the cursor keys.

Choose the highlighted topic by pressing **<ENTER>** From any topic, you may return to this menu by pressing **<ESC>**.

Topic: File

The **File** choice allows you to load, save or print the complete set of modes. When you start the editor the mode file is opened automatically, so **Load** is only necessary if you wish to abandon changes and resume editing on the original set of modes.

Save allows you to save your work without exiting the editor.

Print will print all modes that contain at least one step.

Topic: Run

Run starts the ARC16 program to return to normal operation. If you have made changes to the mode file, you will be prompted to save before exiting the mode editor. Answer (N)o only if you wish to revert to the previous set of modes and abandon all changes made during this edit session.

Topic: Mode

Select Desired Mode					
[F2]	1		16	Transfer	31 46
[F3]	2	F3-AM On	17	Sample	32 47
[F4]	3	F4-AM Off	18	CycleGEN	33 48
[F5]	4	F5-FM On	19	Shut Down	34 49
[F6]	5	F6-FM Off	20		35 50
[F7]	6	EBS Enbl	21		36 51
[F8]	7	EBS Disbl	22		37 52
[F9]	8	F9-TwrLt	23		38 53
[F10]	9	LitesOff	24		39 54
	10	AM Trim	25		40 55
	11	FM Trim	26		41 56
	12		27		42 57
	13	EBSTest	28		43 58
	14		29		44 59
	15		30		45 60

Use the cursor keys to select a mode to edit. Press **<ENTER>** to complete the selection. Generally, the mode numbers are not significant. You may pick any unused mode to enter instructions for a new mode. The first nine modes are the only modes accessible from the keyboard, so these modes should be reserved for functions which you will want to start manually.

Topic: Name

Enter a name for this mode: EBS Test
EBS Test Type: Normal Initial Status: Off

Each mode that contains instructions should be named with a short, descriptive name. To give the mode a new name, select this topic and type the desired name.

Topic: Type

The mode type is set or changed with this topic. A pop-up window will appear with four choices.

Normal Sunrise/Sunset Interval Time
--

Normal is selected for modes that are to be enabled by function key (modes 1-9) or by other modes. **Interval** indicates that the mode will be executed as often as indicated *when enabled*. **Time** is used for modes that are to be executed at a certain time of day *when enabled*.

Use the cursor keys to select the desired type, then press **<ENTER>**.

If you have selected **Interval** or **Time**, you will be asked to enter an interval or time in hours and minutes. Be sure to enter time in 24-hour format (13:00 = 1:00PM).

If you have selected **Sunrise/Sunset** you will be prompted to choose one of four times of day: **Pre-Sunrise**, **Sunrise**, **Sunset** or **Post-Sunset**. Again, make a selection using the cursor keys, then press **<ENTER>**. The actual times for modes of this type are stored in the SCHEDULE.ST and SCHEDULE.DST files which are edited using ARCSETUP.

Topic: Init

Select the initial status of this mode.
Restart Type: Normal Initial Status: Off
OFF
ON

A mode may be enabled when the program is first loaded by specifying an initial condition of **ON**.

All modes that are expected to be on all the time should be set to an initial condition of **ON**. A **Time** mode, for instance, will not execute unless the initial condition is **ON**. Normally, function key modes are set to an initial condition of **OFF**.

Topic: Copy

The **Copy** command allows a mode to be duplicated easily. By copying one mode to another, you can rename the second mode, then make any required edits. This is particularly useful for copying functions such as power adjust for a second transmitter.

Topic: Edit

Use cursor keys (Up,Dn) to select line
Press <RETURN> to edit. <ESC> to return to menu
Restart Type: Normal Initial Status: Off
1*

The required steps for editing a mode are explained in this section. In order to fully understand this section, it will be necessary to study the How Modes Work section on page 55. Return to this section when you are ready to implement the modes you have planned.

Each mode may have up to 19 lines of instructions. Although the lines may initially look complicated, they are actually very simple to edit, since each step of the entry for each line presents a selection window.

The * after the line number indicates the line to be edited. Use the cursor keys to select the desired line.

A line may be inserted by pressing <INSERT>. All subsequent lines will be moved down. Press <DELETE> to remove a line.

Be sure to edit line numbers in GO TO statements after you insert or delete lines.

Execution of the mode begins on the first line and ends on the first blank line. Therefore, it is essential to begin on line 1 or the mode will never execute.

When the desired line has been selected, press <ENTER>. A window will pop up showing the possible actions for this line.

```
Select the desired action for this line.
Press <RETURN> to edit, <ESC> to return to menu
Restart Type: Normal Initial Status: Off
1*
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
If mode
If date
If time
If day
If value
If new value
If status
If new status
If memory
Set mode
Set memory
Increment
Decrement
Raise
Lower
```

Select the desired command from the selection window. The commands are described in the Commands section which follows.

Topic: Quit

The quit command is provided as a means to exit to DOS. Normally, you will use Run instead, which will return directly to the ARC16 program.

Quit provides a chance to save changes before exiting to DOS.

Mode Commands

IF MODE

Tests the current status of the indicated mode.

IF DATE

Tests the current date.

IF TIME

Tests the current time.

IF DAY

Tests the current day of the week.

IF VALUE

Tests a metering value from the specified site. Uses the last value obtained without waiting for a refresh. If telemetry from the site is un-available the value reverts to -1.

IF NEW VALUE

As above, but waits for a refresh before performing the test.

IF STATUS

Tests a status condition from the specified site. Uses the last condition obtained without waiting for a refresh.

IF NEW STATUS

As above, but waits for a refresh before performing the test.

IF MEMORY

Tests one of fifty user memories.

SET MODE

Allows another mode to be turned on or off.

SET MEMORY

Sets the contents of the specified memory to an initial value.

INCREMENT

Increases the value in the specified memory by one.

DECREMENT

Decreases the value in the specified memory by one.

RAISE

Activates the specified RAISE relay for the length of time indicated.

LOWER

Activates the specified LOWER relay for the length of time indicated.

WAIT

Suspends execution of this mode for the length of time specified.

GOTO LINE

Causes an unconditional branch to the indicated line.

MESSAGE

Displays and prints the selected message.

PRINT VALUE

Prints the selected metering value.

PRINT STATUS

Prints the selected status message.

How Modes Work

Each enabled mode runs concurrently with all other enabled modes. Think of AutoPilot as sixty separate computers, all running independent programs.

The mode execution is tightly controlled so that it is almost impossible to make a mistake in one mode which would prevent execution of other modes (Unless the mode is inadvertently commanded to turn off another mode).

Even if a mode contains the instruction 1 GOTO LINE 1, which would be an endless loop in other programming environments, AutoPilot will continue to function properly (although the mode with this instruction will serve no useful purpose).

Mode Instructions

Each mode contains up to nineteen instructions. Each instruction contains a test, a command, a message, or a branch to another instruction.

Tests

All of the actions beginning with “IF” specify a test to be performed to determine the next line to be executed. Each test includes two objects to be compared, a comparison operator and a “go to” line. If the test is true, execution branches to the line indicated, else execution resumes at the next line. If the next line is blank, execution ends and the mode is turned off.

```
1 * If mode EBS test = Off goto line 19
```

Here execution branches if the **EBS Test** mode is **OFF**, else continues on the next line.

It is usually better to test a mode for OFF rather than ENABLED, since an enabled mode that is executing at the same time may actually be in a wait status which would not pass the test for ENABLED even though it actually is enabled.

Note that a branch to an empty line terminates the mode activity and disables the mode.

```
2 If value [D 4] WZZZ FM RF Power < 17.5 goto line5
```

In this case, execution branches to line 5 if the power is less than 17.5 kW. If the power is greater than or equal to 17.5, execution continues on line 3.

An important distinction must be made between IF VALUE and IF NEW VALUE. Since IF NEW VALUE waits for a refresh from the ARC-16, you can be assured that the value reflects the result of any changes that were made by this or another mode. Subsequent comparisons may be made using IF VALUE to speed execution. The following mode segment illustrates this usage:

```
FM Trim      Type: Normal      Initial Status: Enabled
1  If new status [D 2] WZZZ-FM FM Main is 0 = OFF goto line19
2  If new value [D 4] WZZZ-FM FM RF Power < 19 goto line 8
3  If value [D 4] WZZZ-FM FM RF Power < 25.5 goto line 12
4  Goto Line 1
5
6
7
8  Raise [D 3] WZZZ-FM Power Adjust for 1.5 seconds
9  Message | FM Power Adjusted UP
10 Goto Line 1
11
12* Lower [D 3] WZZZ-FM Power Adjust for 1.5 seconds
13 Message | FM Power Adjusted DOWN
14 Goto Line 1
15
```

Commands

A command is an instruction to turn another mode on or off, or a raise or lower command to one of the ARC-16's. Line 8 above is a command to raise the power adjust channel. Whenever a raise or lower command is chosen, the appropriate selection windows will appear to allow the proper site, channel and duration to be chosen.

If consecutive instructions contain commands, there will be a 1 second delay between each command and each command will be asserted for the duration specified. That means that several channels may actually be asserted simultaneously if the pulse width is long

enough for them to overlap. The exception to this is when consecutive commands are issued to the same channel. In this case, the most recent command will terminate the previous command for that channel. This prevents raise and lower from being simultaneously asserted on the same channel.

Messages

Frequently, it is useful to log and display a message when a particular point in a mode is reached. In the mode sample above, every time AutoPilot makes a power adjustment, it reports that fact on the display and on the log.

Use the **MESSAGE** command to print and display a 40-character message. This is useful for logging the execution of a command as in the above examples. There are fifty messages available and each message may be used in any mode. Editing a message will change the text wherever it is used, so take care not to alter a message required by another mode. To edit a new message, select a blank line in the window and press return.

Use the **PRINT VALUE** or **PRINT STATUS** command to print the current value or status of any channel without printing a complete log line. You may use **PRINT VALUE** to print values that are normally not logged, but are of interest only at certain times or if they exceed specified limits.

Use **PRINT LOGLINE** to force printing of the normal log line at any time.

Branches

Each instruction is executed sequentially until a blank line is encountered. The sequence may be altered by conditional branches or by a **GOTO** instruction. All branching is done within the mode.

A mode that needs to be run continuously requires a **GOTO LINE 1** statement. The power adjust example above illustrates this use. Note that the **GOTO** could have been to another line if initialization steps that are not to be repeated are necessary.

Mode Interaction

It is important to understand the interaction of the modes, since it is useful to have modes turn other modes on and off.

Each mode may be in an enabled or disabled state at any time. This state may be altered by the SET MODE command or, in the case of the first nine modes, by pressing the appropriate function key.

A very practical use of this feature is to have the function key modes turn on and off complete sets of modes depending on the time of day, transmitter in use, etc. This means that the operator can depend on the same function key performing an appropriate action regardless of which transmitter is in use or which pattern is correct for this time of day.

Be careful not to construct modes which counteract each other. The best way to avoid this problem is to have a set of master modes which turn one set off before turning another set on.

Interval and Time modes may be created for events which should occur at specific times or intervals, but they are not normally required for periodic testing, since in most cases there is no reason not to test continuously.

User Memories

User memories are intended primarily for counters. It is sometimes desirable to try a procedure several times, then quit or do something else. A transmitter restart procedure, for instance, might be tried three times before reporting failure.

The explanation which follows this example is also useful to gain an understanding of branching instructions.

```
Restart      Type: Normal      Initial Status: Off

1 Set memory 1 to 3
2 If mode F3-AM On = Off goto line 1
3 If new status [B 2] WXXX-AM Main Plate 0 = ON goto line 1
4 Raise [B 2] WXXX-AM Plate ON/OFF for 2 seconds
5 Decrement Memory 1
6 If memory 1 > 0 goto line 2
7 Set mode F3-AM On Off
8 Set mode Aux On Enabled
9 Message | Main AM Xmtr Failed - Starting Aux      |
10*
```

In the above example, memory 1 is used as a “three- strike” counter. The counter is initialized to a value of 3 in line 1. The test in line 2 basically tells this mode to do nothing if the Sign-On key (F3) has not been pressed.

Line 3 will only be executed if the F3-AM On mode is active. This line tests for the status of the plate circuit in the main transmitter. If the plate circuit is on, this mode has nothing further to do, so it branches back to line 1 to continue testing. As long as the mode tested in line 2 remains on, this mode will wait in line 3 until the status of the plate circuit is reported by the ARC-16 again, and will loop until this status indicates that the plates have gone off.

When the test in line 3 fails, line 4 executes, pulsing the plate on for 2 seconds.

Since we want to try this three times before giving up, the counter is decremented in line 5.

Line 6 checks to see if we’ve already done this 3 times. If we have, execution continues on line 7, otherwise the branch goes back to line 2.

If the plates are back on, the counter is reset by going back to line 1. If not, we try again until the test in line 6 fails.

Line 7 uses the SET MODE command to disable the normal transmitter on mode. We’ve tried to restart three times without success, and we don’t want to keep banging on this rig.

Line 8 starts a different mode which is a set of instructions for turning on the Auxiliary transmitter.

Line 9 tells the operator what has happened.

Since line 10 is blank, this mode is now finished and will not execute any more instructions (even if there were instructions on line 11).

Using AutoPilot

AutoPilot runs silently in the background during normal ARC16 operation. About the only thing the operator has to be aware of is the possibility that AutoPilot will override his commands from the keyboard. If, for instance, a mode is running which is designed to reset the plates if they get knocked off, every time the operator hits the plates off, AutoPilot will put them right back on.

This is easily avoided by turning AutoPilot off (Press A) before doing any manual controlling.

With a properly constructed set of modes, the operator should have little reason to issue commands directly.

AutoPilot Operations

While running ARC16, Press <PAGE UP> or <PAGE DOWN> to display an additional page titled AutoPilot Operations.

06-20-1991 AutoPilot Operations 03:06											
Mode ID	S Time	PC	Mode ID	S Time	PC	Mode ID	S Time	PC	Mode ID	S Time	PC
F2	00:00	1		00:00	1		00:00	1		00:00	1
F3-AM On	00:00	1	CycleGEN E	18:50	1		00:00	1		00:00	1
F4-AMoff	00:00	1	Shut Dwn E	22:59	1		00:00	1		00:00	1
F5-FM On	00:00	1		00:00	1		00:00	1		00:00	1
F6-FMoff	00:00	1		00:00	1		00:00	1		00:00	1
F7	00:00	1		00:00	1		00:00	1		00:00	1
F8	00:00	1		00:00	1		00:00	1		00:00	1
F9-TwrLt W	00:00	2		00:00	1		00:00	1		00:00	1
F10	00:00	1		00:00	1		00:00	1		00:00	1
AM Trim	00:00	1		00:00	1		00:00	1		00:00	1
FM Trim W	00:00	1		00:00	1		00:00	1		03:05	1
	00:00	1		00:00	1		00:00	1		03:15	1
EBS Test E	09:15	1		00:00	1		00:00	1		00:00	1
	00:00	1		00:00	1		00:00	1		00:00	1
Transfer E	02:59	1		00:00	1		00:00	1		00:00	1
	00:00	1		00:00	2		00:00	1		00:00	1

<u>LOGGING</u>	<u>AutoPilot</u>	<u>COMMANDS</u>	<u>STATUS</u>
(C)=Change Logging	(A) = Turn Auto OFF	(F1) = HELP	Logging: 2 HOURS
(H)=Print Log Title			LOCAL CONNECTION
(L)=Print Log Line	(M) = Edit Modes		

Each mode is displayed with current information about the mode. The first nine modes are reserved for function keys [F2] through [F10]. A mode assigned to one of these keys will be enabled by pressing the appropriate function key. The modes are enabled by execution of other modes. An E in the status column signifies that the modes is enabled and ready to run.

If the mode is a TIME or INTERVAL type, the time scheduled for the next execution of the mode is shown in the Time column.

An enabled mode may be waiting at some step before execution continues. This is indicated by a W in the Status column if the wait is a time delay. If the mode is waiting for new data before proceeding, a D will appear. An active mode will display E. The PC (program counter) column shows the next step to be executed by the mode. A mode that is not enabled will always be at step 1.

Using this screen and referring to a listing of the user-defined modes, it is possible to determine the state of any mode.

The entire staff at Burk Technology hopes you find using CDL and AutoPilot to be an enjoyable experience. We're all proud of our products and of the high standards of service and support that we have been able to provide.

We hope you will share your comments with us, favorable or otherwise, in order that we might continue to provide the best possible remote control solutions to the broadcast industry.

Appendix A

COMMAND SUMMARY

ARC16

To start the normal program (CDL or CDL w/AutoPilot), first change to the drive and directory where ARC16 is installed. If ARC16 is on drive C in directory \CDL, type

<ENTER>

CD \ CDL **<ENTER>**

Then type

ARC16 **<ENTER>**

to start the program.

Use the following commands while running ARC16:

Modem

D

Dial remote site.

L

Dial remote site, print Log Line, Disconnect.

T

Telephone answer enable/disable.

[ESC]

Disconnect from remote site.

Display

[PageUp]

Next screen

[PageDown]

Previous screen

[F1]

HELP window

[ALT]-V

Program name and version

[ALT]-T
Time zone window

Control

0-9
Select command channel.

[UpArrow]
Select previous channel

[DnArrow]
Select next channel

[Home]
Select channel 1

[End]
Select channel 16

[Ctrl-Left Arrow]
Send LOWER command on selected channel

[Ctrl-Right Arrow]
Send RAISE command on selected channel

Logging

C
Change logging interval.

H
Print Log Header.

L
Print Log Line.

Quit

[ESC]
Exit program and return to DOS

AutoPilot

In addition to the above, the following commands are available if AutoPilot is installed:

A

Toggle AutoPilot on and off.

M

Enter Mode Editor.

[F2]-[F9]

Start a function key activated mode.

EDLABEL

To start the ARC16 program with on-screen label editing enabled, first change to the drive and directory where ARC16 is installed. If ARC16 is on drive C in directory \CDL, type

C: <ENTER>

CD \ CDL <ENTER>

Then type

ARC16 <ENTER>

All of the ARC16 commands listed above are available, plus the following commands which are used to edit labels on-screen.

Select label to edit

[Left Arrow]

Move Left to highlight screen label

[Right Arrow]

Move Right to highlight screen label

Enter Edit mode

E

Edit highlighted screen label

Editing

[ENTER]

Save changes to label

[ESC]

Abandon changes to label

Status messages

[Left Arrow]

Change from ON message to OFF

[Right Arrow]

Change from OFF message to ON

[ALT]-P

Toggle message printing on change

[Up Arrow]

Next color (ON message only)

[Down Arrow]

Previous color (ON message only)

ARCSETUP

To start ARCSETUP, first change to the drive and directory where ARC16 is installed. If ARC16 is on drive C in directory \CDL, type

C: <ENTER>

CD \ CDL <ENTER>

Then type

ARCSETUP <ENTER>

to start the program. Use the following commands while running ARCSETUP:

Select topic

[Left Arrow]

Select previous topic.

[Right Arrow]

Select next topic.

A-Z

Select topic with initial letter.

[ENTER]

Open window for highlighted topic.

Cursor

[Arrow keys]

Move cursor by character

[TAB]

Move to next field

[SHIFT]-[TAB]

Move to previous field

Data entry

[ENTER]

Accept entry and advance to next field

Multiple choice fields

[SPACE]

Open choice window

[Up Arrow]

Move up one choice

[Down Arrow]

Move down one choice

[ENTER]

Accept entry and advance to next field

Return to main menu

[F2]

Return to main menu. Prompts for save if any changes have been made.

[F3]

Return to main menu. Automatically saves if any changes have been made.

Help

[F1]

Displays help for the currently selected field.

Appendix B

HARDWARE INSTALLATION

The ARC-16 Remote Control System may be controlled by CDL or AutoPilot software only if a computer interface has been installed in one of the ARC-16 units. This may be a Model CI Computer Interface or a Model ESI Enhanced Speech Interface.

The Model CI is equivalent to the interface included with the older CI-16.

To verify that an interface is installed in your ARC-16, check the rear apron for the presence of a DB-25 or DB-9 connector. Also note whether there are RJ-11 telephone jacks next to the connector.

A DB-25 connector with no RJ-11's indicates the presence of a Model CI computer interface. Follow the instructions in this appendix for using this interface.

A DB-9 connector with two RJ-11's and a phono jack indicates an ESI is installed. Follow the ESI instructions in this appendix.

A DB-25 with one or two RJ-11 jacks indicates a DSU/CI-16 is installed. CDL and AutoPilot version 4.5 or above will not function with this option. You must either use an older version of software or upgrade to ESI to add computer control to this unit.

Checking the Baud Rate

The Model ESI is preset at 1200 baud. You may proceed to the ESI connections section if you are using this interface.

The Model CI may be strapped for 300 or 1200 baud. To determine the current setting, locate the baud rate jumper on the board and refer to the CI schematic for the proper setting. Change the strap if necessary to set the desired baud rate.

A different jumper is necessary when changing from ARC4.4 or below to ARC4.5 or above. If you are upgrading an older CI-16 interface, a change in this strap is mandatory. Be sure to cut the etched link on the board if no strap is currently installed.

Installing the Interface

If you have determined that an interface is already installed in the ARC-16 unit and that the baud rate is correct, you may skip this section and continue with the CI or ESI Connections section as appropriate.

Installing the Model ESI

If you have purchased an ESI as an option or upgrade, refer to the ESI manual for hardware installation instructions. After completing the installation and setup of the ESI, refer to the ESI Connections section in this appendix to complete the installation.

Installing the Model CI

If you have purchased the Model CI Computer Interface, you will need to install the board in the ARC-16. For field installation, the CI circuit board is shipped with the following accessory items:

- 3 - #6-32 x 1 M/F standoffs
- 3 - #6-32 x 1/4 machine screws
- 1 - 24-pin ribbon jumper

Installation in Units with I/O Boards

The CI must be installed as the top board in the right rear of the ARC-16. Remove the front center, rear center, and rear right hand #6 mounting screws from the uppermost I/O board and replace them with the standoffs provided.

Next, connect one end of the 24-pin ribbon jumper to the header on the CI so that it extends away from the board. Install the CI on the standoffs so that the DB-25 connector extends through the slot in the rear of the ARC-16. Secure with the #6 screws provided.

Connect the 24-pin jumper to the AUX board which is at the right end of the CPU board. The jumper must be connected to the header closest to the display board. Exercise caution when mating the connectors,

as they are easily mis-registered.

Installation in Units Without I/O Boards

Standoffs are not necessary when installing a CI in a studio unit with no other accessory cards. Proceed as above but mount the CI directly to the PEM fasteners in the chassis. It is still necessary to connect

to the front header on the AUX board.

CI Connections

This section applies only if you are using the Model CI interface. If you are using the Model ESI, refer to the ESI Connections section.

The Model CI is normally connected to the computer using a direct link and the RS-232 protocol. The DB-25 connector on the rear of the CI is connected to COM1 or COM2 on the computer. The computer may be located up to fifty feet from the ARC-16.

Connect the computer using a standard 25 conductor cable and a null modem adapter. 25-pin to 9-pin adapters are readily available if the computer has a 9-pin connector. The null modem adapter, a small unit with a male and female 25-pin connector, is readily available at any computer outlet.

If it is necessary to construct a cable, the required connections are shown here.

CI-16	Computer
Pin 1	Pin 1
Pin 2	Pin 3
Pin 3	Pin 2
Pin 4	Pin 5
Pin 5	Pin 4
Pin 7	Pin 7
Pin 20	Pin 8
	Pin 20
	Pin 6

ESI Connections

Direct Connection

The RS-232 connector on the ESI is a DB-9M. To connect to the computer, you will need a cable which is wired according to the appropriate diagram below. If your computer has a 25-pin COM port, a 9-pin female to 25 pin female cable is required. If you are using a computer with a 9-pin COM port, a cable with DB-9 female connectors on each end may be used.

If necessary, a cable may be constructed using these pinouts.

A ten foot DB-9F to DB-25F cable is available from Burk Technology.

DB-25F (to computer)	DB9-F (to ESI)
-------------------------	-------------------

2 TxD.....	2 RxD
3 RxD	3 TxD
5 CTS	7 RTS
7 GND.....	5 GND

DB-9F (to computer)	DB9F (to ESI)
------------------------	------------------

2 RxD	3 TxD
3 TxD	2 RxD
5 GND.....	5 GND
8 CTS	7 RTS

Model CI Schematic

ESI Computer Interface Schematic

Appendix C

CUSTOMIZING COLORS

The colors used for various types of information on the ARC16 screens are controlled by data in the color code file. There are three default color code files in the CDL directory. They are named COLORC.ODE, MONOC.ODE and BLKWHTC.ODE. One of these three files is selected for use in ARCSETUP (DISPLAY topic).

In most cases, one of these three files will produce good results on your monitor. However, you may edit any of these three files with an ASCII editor if you wish to use a custom set of colors.

For each type of displayed information, there are two values that must be specified. The first is the foreground color. The second is the background.

Some experimentation may be necessary to produce a set of colors that works for your application.

Be aware that not every possible message or display has a unique color pair. A change in any of these values may have an effect on another part of the display. Check in particular that the bar graph display is satisfactory after making any changes to the color code file.

In the event that you wish to return to the default set, delete any modified color code files and re-run install to replace the files with the original. Alternatively, you may wish to keep a backup of the original before you begin editing. Simply copy the file to be edited to a file with another name, such as COLORC.OLD.

Default Color Codes

COLORC.ODE File

MONOC.ODE File

BLKWHTC.ODE File

7	2	5	Normal text
1	15	0	
14	0	8	Low alarm limits
1	15	5	
12	0	8	High alarm limits
1	15	5	
12	8	24	Status ON condition
1	15	5	
9	2	0	Status OFF condition
1	15	0	
15	10	0	Control channel highlight
1	15	5	
12	10	10	Raise command issued
1	15	5	
14	10	10	Lower command issued
1	15	5	
1	0	0	Frame across top of screen
7	15	10	

0	BLACK	17	BLINKING BLUE
1	BLUE	18	BLINKING GREEN
2	GREEN	19	BLINKING CYAN
3	CYAN	20	BLINKING RED
4	RED	21	BLINKING MAGENTA
5	MAGENTA	22	BLINKING BROWN
6	BROWN	23	BLINKING WHITE
7	WHITE	24	BLINKING GREY
8	GREY	25	BLINKING LIGHT BLUE
9	LIGHT BLUE	26	BLINKING LIGHT GREEN
10	LIGHT GREEN	27	BLINKING LIGHT CYAN
11	LIGHT CYAN	28	BLINKING LIGHT RED
12	LIGHT RED	29	BLINKING LIGHT

13	LIGHT MAGENTA	30	MAGENTA
14	YELLOW	31	BLINKING YELLOW
15	BRIGHT WHITE		BLINKING BRIGHT WHITE
16	BLINKING BLACK		

Appendix D

FORMS

The form on page 83 provides a convenient means of collecting all of the information for each channel in the system. Photocopy the form so that you have one page for each channel.

The completed forms should be bound and kept with the manual for future reference. It is suggested that the forms be completed before running ARCSETUP, as this will reduce the time required to set up the system.

The form is divided into ARC-16, CDL/AutoPilot and ESI sections. Complete only the sections needed, depending on the options installed in your system. Blanks that are noted “for reference” are not actually entered into the system, but are useful during the editing of other values.

A sample form is included for reference.

ARC-16

All of the data in this section refers to the ARC-16 unit. CDL and ESI labels will be edited based on the information in this section. See the ARC-16 manual for details about any of these values.

SITE

Enter the name of the site for this channel.

SITE LETTER

Enter the letter for this site, as displayed on the ARC-16 to the left of the channel number.

CHANNEL#

Enter the channel number.

LABEL

Enter up to seven characters for the label for this channel that appears on the ARC-16 LCD display. This label should reflect the control and/or metering function of the channel.

CONTROL FUNCTION

For reference, enter the raise/lower function.

METERING FUNCTION

For reference, enter the metering function.

UNITS

For reference, enter the unit of measurement (kV, mA, etc.).

NOMINAL VALUE

For reference, enter the expected normal reading of this channel. This information will be useful for setting the CDL bar graph scaling in ARCSETUP.

SAMPLE VOLTAGE

For reference, enter the measured sample voltage for this channel.

Recording this value will aid in troubleshooting.

DECIMAL POINT

Circle the desired position of the decimal point.

TYPE

Circle the type of metering.

LOW LIMIT

Record the low limit for this channel. This is an alarm point.

HIGH LIMIT

Record the high limit for this channel. This is an alarm point.

STATUS FUNCTION

For reference, enter the status function for the status input numbered the same as this channel.

STATUS POLARITY

Circle whether this status input is normal or inverted.

STATUS ALARM

Circle whether this status channel is set to trigger an alarm.

CDL

CONTROL LABEL

Enter a screen label of up to 12 characters. This label should describe the raise/lower functions for this channel.

METERING LABEL

Enter a screen label of up to 10 characters. This label should describe the metering function for this channel.

UNITS LABEL

Enter a screen label of up to 7 characters to describe the unit of measurement for this channel.

LOGGING CHANNEL?

If this is a channel that will appear on the log, circle Y.

LOG LABEL

If this is a logging channel, express the metering label in two lines of up to seven characters each. This label will appear above the appropriate column on the operating log.

UNITS

This label may be any seven characters, but is intended for the unit of measurement for this channel which will appear on the operating log.

COLOR

Enter the color desired for display of the status ON message.

PRINT STATUS CHANGES?

Circle Y if a line should be printed on the log each time this status channel changes.

STATUS ON

Enter a message of up to 20 characters to be displayed when this status channel is ON.

STATUS OFF

Enter a message of up to 20 characters to be displayed when this status channel is OFF.

ESI

CHANNEL LABEL

Enter up to four words from the ESI vocabulary to describe this channel. Enter the three-digit numbers for each word directly under the word.

UNITS LABEL

Enter up to two words from the ESI vocabulary for the unit of measurement for this channel.

STATUS ON MESSAGE

Enter up to four words from the ESI vocabulary to describe the Status ON condition.