

"LINEAGE" XCS CONTROLLER  
 J85501B

## CHANGES

A. Changed and Added Functions

A.1 The Expandable Controlled System (XCS) adjunct board has been added as option P with reference designation CP 2 to allow the user remotely to monitor plant alarms and load parameters and to control some plant functions.

A.2 A modem (data set) that is used only when the controller is equipped with option P has been added as option M to allow the user to communicate with CP 2 over telephones lines.

B. Changes in ApparatusB.1 Added

App Fig 6, FS 8 - P Option

App Fig 7, FS 9 - M Option

B.2 SupersededSuperseded By

J2 Connector, AMP J2 Connector, AMP  
 3-530841-5 - 1-530841-1 -  
 App Fig 1 App Fig 1

J6 Connector, AMP J6 Connector, AMP  
 25030841-6 - 530841-2 -  
 App Fig 1 App Fig 1

J8 Connector J8 Connector  
 KS-20667 L2 KS-20667 L3  
 App Fig 1 App Fig 1

Fuse Block 3 Fuse Block 3  
 27A Fuse Block - 27A Fuse Block,  
 App Fig 4 equipped with  
 70G Alarm Fuses  
 App Fig 4

TB1.1 Terminal TB1.1 Terminal  
 Block, Curtis Block 980-S-23 -  
 SEIPR-23 - App Fig 1  
 App Fig 1

TB1.2 Terminal TB1.2 Terminal  
 Block, Curtis Block 980-S-23 -  
 SEIPR-23 - App Fig 1  
 App Fig 1

D. Description of Changes

D.1 In App Fig 6 and FS 8 on the drawing, XCS microprocessor board ED-82611-30 has been added as option P with reference designation CP 2.

D.2 In App Fig 7 and FS 9, modem data set 212ALP has been added as option M.

D.3 In App Fig 6 and FS 8, W1 cable assembly M-285-224 L199 has been added. This cable assembly is used with controllers equipped with option P when there is need to communicate with CP 2 using a local terminal, that is, not through the modem.

D.4 A wiring change consisting of a connection from terminal block TB1.1 terminal 22 to connector J6 terminal 15 on CM 1 has been added on the drawing as option M. Wiring formerly not designated has been designated option L and rated DISCONTINUED AVAILABILITY-(DA).

D.5 On the drawing, FS 1 and FS 2 have been changed by the addition of options P, M, and N.

D.6 In App Fig 8, fuse block 3 has been changed by the addition of "equipped with 70G alarm fuses."

D.7 Circuit Note 102 has been changed by the addition of options P and M.

D.8 Circuit Note 103 has been changed by the addition of options P, M, and N [rated AVAILABLE (AVAIL)] and option L (rated DA).

D.9 Circuit Note 109 has been changed by a new table that gives the dual in-line package (DIP) switch settings on the CPS-AKW1 that correspond to specified high-voltage and low-voltage alarm settings for specified float voltages.

D.10 Circuit Note 112, regarding the features corresponding to valid switch positions on ED-82611-30 DIP switch S2, has been added on the drawing.

D.11 Circuit Note 113, regarding modem switch settings and connections, has been added on the drawing.

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- D.12 In Information Note 302C, the 27A fuse block was 25A fuse block.
- D.13 In Information Note 303 lead designations SI(C) and SIR(C), "RECT FAIL" was "Discharge Fuse or CB trip."
- D.14 Information Note 310, regarding the component side of CP 2, has been added on the drawing.
- D.15 Information Note 311, presenting information regarding CM 1 circuit module options L and M, has been added on the drawing.
- D.16 Information Note 312, regarding the application of cable assembly W1, has been added on the drawing.
- D.17 In CAD 1 on the drawing, terminal numbers, which were not shown in Issue 1 on SD-82646-01, have been added.
- D.18 On the drawing, CAD 5 and CAD 6 have been added.
- D.19 The Option Index table has been changed by the addition of options P, M, M, and L.

F. Changes in Description of Operation

- F.1 In the Table of Contents, Section II, add Part 8 and Part 9 as follows:

8. OPTION P

MONITORING FEATURES

CONTROL FEATURES

9. OPTION M

- F.2 In Section II, add Part 8 as follows:

8. OPTION P

8.01 Functional schematic FS 8 shows the option P wiring. This option consists of a plug-in board (CP 2) that allows the user remotely to monitor plant alarms and load parameters and to control some plant functions.

MONITORING FEATURES

8.02 Real-Time Events

Battery voltage and plant load current status of alarms.

- (a) Battery on Discharge (BD)
- (b) Rectifier Failure (RFA)
- (c) High Voltage (HV)
- (d) Major Fuse Alarm (FAJ)

- (e) Minor Fuse Alarm (FAM)
- (f) Boost Fuse Alarm (BFA).

8.03 Statistical Data

- (a) Load Current Statistics
  - (1) Three highest hourly average amperage drains
  - (2) Three highest hourly peak drains
  - (3) Three lowest hourly minimum drains
- (b) Alarm History
  - (1) Up to 40 most recent alarm events
  - (2) Time and date of alarm event
  - (3) Occurrence or retirement of alarm

(c) Boost Charge Status History

- (1) Up to 20 most recent boost charge events
- (2) Method by which boost was started
- (3) Date and time of boost turnon
- (4) Total time on boost.

CONTROL FEATURES

8.04 Remote restart of connected rectifiers.

8.05 Program turnon of boost charge option (when so equipped).

- F.3 In Section II, add Part 9 as follows:

9. OPTION M

9.01 This option provides a modem to allow the user to communicate with CP 2 over telephone lines. Functional schematic FS 9 shows the modem wiring.

- F.4 In Section III, change paragraph 1.01 to read as follows:

1.01 The values of the low-voltage and the high-voltage alarms can be varied depending on the settings of switches S1.1 through S1.5 and S2.1 through S2.4. This is done to compensate for the different float voltages (see Circuit Note 109 on SD-82646-01) that can be accommodated by this controller.

AT&T BELL LABORATORIES

POWER SYSTEMS  
 LINEAGE<sup>®</sup> XSC CONTROLLER  
 J85501B

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addition, the controller can be equipped with the following options:

- Option U: Analog plant-voltmeter and plant current-meter
- Option S: No distribution and no reg. fuses
- Option R: Reg. fuses and no distribution
- Option Q: Distribution, shunt and no reg. fuses
- Option V: Reg. fuses and shunt
- Option T: Wiring for plant equipped with low voltage disconnect panel

SECTION II - DETAILED DESCRIPTION

1. CONTROLLER

1.01 FS1 illustrates the input and output leads associated with the controller. The controller can handle up to six rectifiers. Rectifiers are assigned in groups of two (i.e., 1-2, 3-4, and 5-6). The rectifiers can be mixed in combinations of sizes from 25 to 200A except the 35A rectifiers, which cannot be mixed with any other sizes within a group.

1.02 The standard rectifier connections between the controller and the rectifier are as indicated below:

<u>Designation</u>	<u>Function</u>
BAT	Provides battery to the rectifier. This battery supply is needed for operation of rectifier alarms.
HV	The HV monitor in the controller shuts down the rectifier when the battery voltage exceeds predetermined limits.
RB/RC	The rectifier senses the battery voltage over these leads. The RB and RC leads are converted to R- and R- in the rectifier.

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This controller provides the control and alarm circuits to monitor the charge and discharge circuit of a battery plant. It sends alarms whenever a rectifier in the plant fails, a fuse operates, or a circuit breaker trips. It also provides restart when a rectifier fails.

2. GENERAL DESCRIPTION OF OPERATION

2.01 The controller monitors the charge-discharge circuit and sends visible and audible alarms when a rectifier fails, a fuse operates, a circuit breaker trips, or battery voltage is not within predetermined limits. The controller can accommodate up to six rectifiers and has adjustable BD and HV alarm set points. In

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<u>Designation</u>	<u>Function</u>
RFA/RFAR	The rectifier's RFA relay provides a closure that operates the controller's RFA relay when the rectifier fails.
RS/RSR	The controller makes one attempt to start a rectifier over the RS lead when the rectifier has a high voltage failure.
TR/TRR	Remote shutdown from engine control.
CB/CBR	Circuit breaker trip alarm.
LOA/LOAR	A limited output alarm from the rectifier provides a closure which operates the controller's RFA relay.

1.03 The standard alarm and status indicator connections between the controller and alarm circuits are as indicated below:

<u>Designation</u>	<u>Meaning</u>
SI(A),SIR(A)	Status indicator alarm, Battery Discharge
SI(B),SIR(B)	Status indicator alarm, High Voltage
SI(C),SIR(C)	Status indicator alarms (FAN/RFA)
SI(E),SIR(E)	Status indicator alarms (MJF)
PMN,PMNR	Power Minor & Return
PMNV,PMNVR	Power Minor Visual & Return
PMJ,PMJR	Power Major & Return
PMJV,PMJVR	Power Major Visual & Return
RMRS,RMRSR	Remote Restart & Return
A,AR	FSS Minor Alarm & Return
D,DR	FSS Major Alarm & Return
ABS( )	Alarm Battery Supply
BD,BDR	Battery on Discharge & Return

<u>Designation</u>	<u>Meaning</u>
FG	Frame Ground
TR( )	Remote shutdown
FAJ	Major Fuse Alarm
FAN	Minor Fuse Alarm
BATSH,BATSHR	Plant Shunt Monitor Leads

## 2. VISUAL INDICATORS

2.01 FS3 shows the alarm LEDs and optional ammeter and voltmeter.

2.02 The LEDs will light for the conditions listed below:

<u>LED</u>	<u>Condition</u>
BAT DISCH	The controller has determined the battery is on discharge.
FUSE ALARM MAJOR	F1, F2, or a load fuse is operated, a load circuit breaker tripped, or the LV Disconnect Panel disconnects the load from the battery.
RECT FAIL	A connecting rectifier has failed.

## 3. CM1 (BACKPLANE)

3.01 CM1 is the central connecting point between the controller and connecting alarm circuits; it also serves as the interface between the battery and the AKW1 control board. Straps on this backplane (STP1 thru STP26) are used to configure the controller for the required polarity (±) and voltage (24/48).

## 4. OPTION S

4.01 FS4 shows the basic controller without REC fuses or distribution fuses. The BAT fuse (F1) is used to supply battery power to the rectifier alarms and provide board power to the CM1 backplane. The ABS(F2) fuse provides battery to external alarms. The plant load is monitored utilizing a shunt mounted between the Charge Ground Bus and the Discharge Ground Bus in an external distribution bay.

## 5. OPTION O

5.01 FS5 represents the controller when equipped with three fuse blocks and internal load monitoring shunt. The first fuse block contains the BAT(F1) fuse which provides power to the CM1 backplane and the associated rectifier alarm circuits. The second fuse block contains the ABS(F2) fuse which provides power for the external alarms. The third fuse block contains eight fuses for load distribution and eight pilot fuses. Also contained in the controller is the load distribution shunt

which is used to monitor the external load. The FAJ(R1) resistor is used for current limiting to the FAJ alarm circuit.

6. OPTION R

6.01 FS6 shows the Option R configuration: the controller is equipped with one fuse block containing nine fuses. These fuses consist of: the BAT(F1) fuse which provides power to the CM1 backplane and associated rectifier alarm circuits; the ABS(F2) fuse which provides power for the external alarms; the SENSE(F3) fuse which protects the lead providing the sense voltage for proper operation of the HV or BD alarms; and the RB1-RB6 (F4-F9) fuses which provide protection for the regulation leads for the individual rectifiers connected to the controller. The load monitoring shunt is mounted external to the controller. The FAJ(R1) and FAN(R4) resistors are used for current limiting to the FAJ and FAN alarm circuits respectively.

7. OPTION V

7.01 FS7 shows the Option V configuration which is the same as that shown in FS6 except for an internally mounted load shunt.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 The values of the low voltage and the high-voltage alarms can be varied depending on the settings of switches S1.1-S1.5 and S2.1-S2.4. This is done in order to compensate for the different values of float voltages (see Note 107 on SD-82646-01) that can be accommodated by this controller. The values for the float voltages and voltage limits are shown below:

<u>Float</u>	<u>Low Voltage</u>	<u>High Voltage</u>
52.08	51.25 $\pm 0.50$	53.00 $\pm 0.50$
53.00	52.00 $\pm 0.50$	54.00 $\pm 0.50$
54.00	53.00 $\pm 0.50$	55.00 $\pm 0.50$
55.00	54.00 $\pm 0.50$	56.00 $\pm 0.50$
56.00	55.00 $\pm 0.50$	57.00 $\pm 0.50$
26.04	25.50 $\pm 0.25$	26.75 $\pm 0.25$
26.50	26.00 $\pm 0.25$	27.25 $\pm 0.25$
27.00	26.50 $\pm 0.25$	27.75 $\pm 0.25$
27.50	27.00 $\pm 0.25$	28.25 $\pm 0.25$
28.00	27.50 $\pm 0.25$	28.75 $\pm 0.25$

2. FUNCTIONAL DESIGNATIONS

2.01 LEADS

<u>Designation</u>	<u>Meaning</u>
RB	Regulation Battery
RG	Regulation Ground
TR	Remote Shutdown
RSR	Restart Return
RS	Restart
BAT	Battery to Rectifier
HV	High Voltage
CB	Circuit Breaker
LOA	Limited Output Alarm
RFA	Rectifier Failure Alarm
CBR	Circuit Breaker Return
LOAR	Limited Output Alarm Return
RFAR	Rectifier Failure Alarm Return
TRR	Remote Shutdown Return

3. FUNCTIONS

- (a) Equipped for either circuit breaker and/or fuses for load distribution.
- (b) Ability to accept combinations of rectifier sizes.
- (c) Ability to control up to six rectifiers.

4. CONNECTING CIRCUITS

- 4.01 SD-82649-01 Charge and Discharge Circuit
- SD-83104-01 Charge and Discharge Circuit
- SD-82604-01 Rectifier
- SD-82605-01 Rectifier
- SD-82395-01 Rectifier
- SD-82396-01 Rectifier
- SD-82397-01 Rectifier
- SD-82398-01 Rectifier
- SD-82399-01 Rectifier
- SD-82400-01 Rectifier

5. MANUFACTURING TESTING REQUIREMENTS

- 5.01 The manufacturing testing requirements are covered by Specification X-80092.