SHEET INDEX

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FS 2 BATTERY DISTRIBUTION	B2	7B
FS 3 LOAD DISTRIBUTION PANELS	B3	7B
FS 3 LOAD DISTRIBUTION PANELS	B3A	7B
FS 4 LOW VOLTAGE BATTERY DISCONNECT CIRCUIT	B4	7B
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FS 7 FILTER CHARGER	B7	7B
FS 8 LOW VOLTAGE LOAD DISCONNECT	B8	7B
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FS 10 RECTIFIERS & ECS-6U CONTROLLER	B10	7B
APP FIG. 1, 2, 3	C1	7B
APP FIG. 4 & 5	C2	7B
CIRCUIT NOTES EQUIPMENT NOTES	D1	7B
INFORMATION NOTES	D2	7B
	D3	7B
CIRCUIT DESCRIPTION	E1	7B
	E2	7B
	E3	7B
CAD 1	G1	7B
CAD 1, 2, 3	G2	7B
CAD 4, 5	G3	7B

OPTION INDEX

APP OR WRG	RATED ON ISSUE	REF NOTES	LOCATION
Z			1B1, 2E0, 2E1, 7D5, 7D6, 10B1
Y			8E5, 1B2, 2E0, 2G3, 10C1
X			8E5, 1B2, 2E0, 2G3, 10C1
W			APP FIG 1, 3, APP FIG 4, 1B1, 2E1, 3AF1, SHT B5, B6, B8 7D5, 7D6, 10B1
V			1B5, 1B3, 2A1, 2F2, 2D3, 4C2 SHT B8
U			
T			1F7, 2D1, 2F3, 2D3, SHT B4
S			1B3, 1B5, 2D3, 2A1, 2F2, 4C2
R			1B3, 1E5, 1F7, 2D3, 2A1, 2F2, 4C1
Q			1B3, 1E5, 1F7, 2D3, 2A1, 2F2, 4C1
P			3D5, 3F5, 3E3, 3AE5, 3A96, SHT B7
N	STD 2		2B2, 2G0, 3AF1, SHT B5
M	STD 2		SHT B5, 2B2, 2F2
L			3E5, 3G6
K			3E5, 3G6
J			SHT B9
H			2H1, 2C2, 3E3, 3D1, 3AD3, 3AG4, 3AC0, 3B0
G			2H0, 3D1, 3B0, 3D3, 3AG4, 3AD4, 3AC0, 2C2
F			2H0, 3D1, 3B0, 3D3, 3AG4, 3AD4, 3AC0, 2C2
E	DA5		3AG8
D	GA5		3AG8
AA	GA7		SHT B10
AB	GA7		SHT B10

DWG ISS	CD ISS	DATE ISS	DRAWN	APPD
1	1	09-11-85		WH
2B	1 APPX 1B	07-11-86		WH
3B	1 APPX 2B	02-25-87		WH
4B	1 APPX 3B	08-03-89		PS
5B	1 APPX 4B	01-21-91		MCS
6M	1 APPX 5B	12-23-91		MAO

REDRAWN TO ORCAD FORMAT. ADDED FS10 AND CIRCUIT DESCRIPTION.

PDI: 94ESDJ0312

7B	1 APPX 7B	03-25-94	JDT	KEG

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SYSTEM USED ON	DESIGN CONTROL
POWER	DJ

SUPPORTING INFORMATION

CATEGORY	NO.
EQUIPMENT DRAWING	J85500C-2 H589-411
EQUIPMENT DESIGN REQUIREMENT	802-628-001
AT&T PRACTICES	802-001-180 803-500-410
CONTROLLER CKT	SD-83122-01 SD-82646-01

SHEET INDEX NOTES

1. ONLY THE LATEST ISSUE, OR ISSUES IF CONCURRENT, ARE SHOWN IN THE INDEX.
2. FOR REISSUES, A CHANGED OR NEW SHEET IS ASSIGNED THE SAME ISSUE NUMBER AS SHEET 1.
3. THE ISSUE NUMBER OF SHEET 1 IS RECOGNIZED AS THE ISSUE NUMBER OF THE WHOLE DRAWING.

BM10

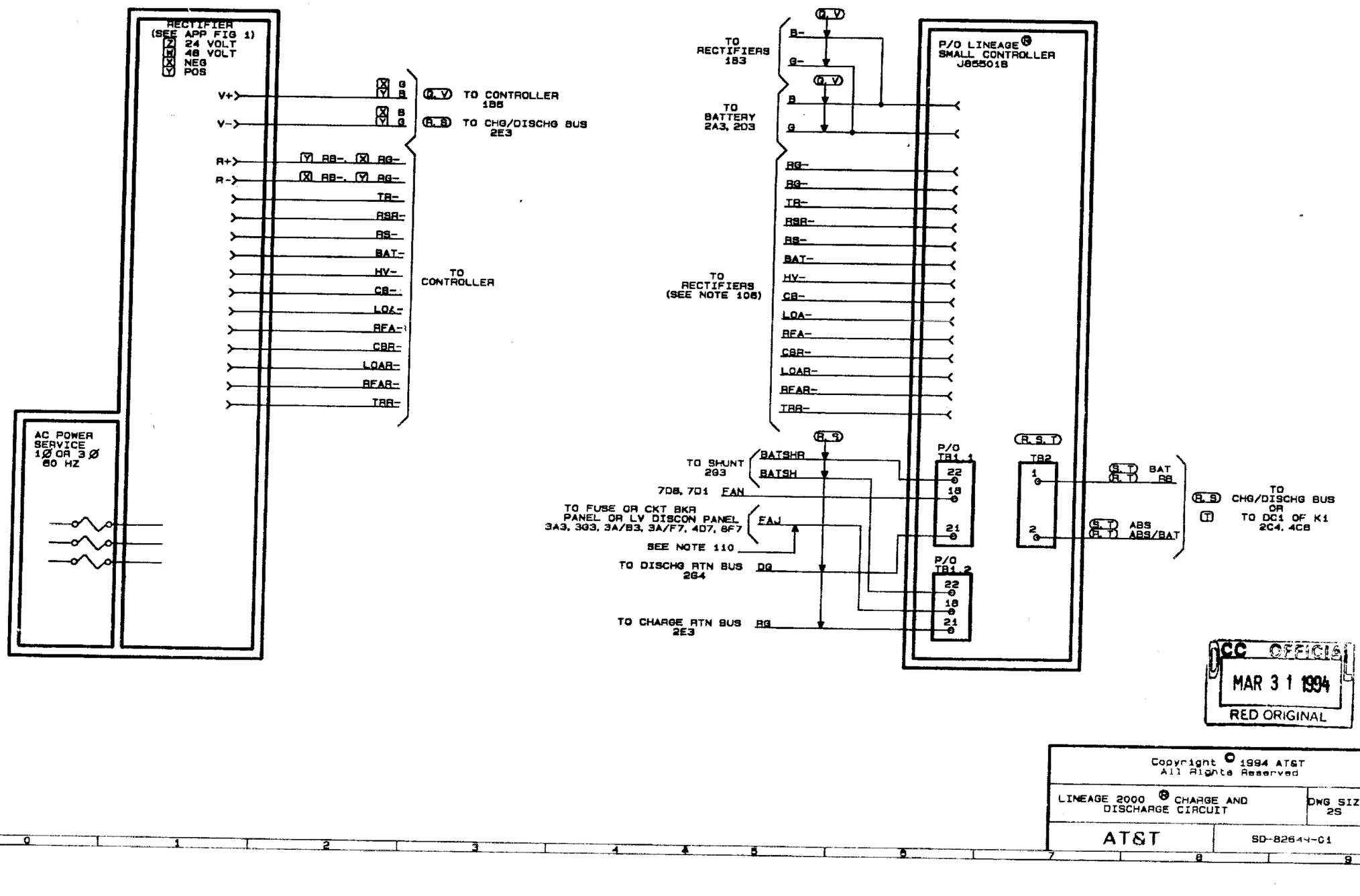
POWER SYSTEMS
LINEAGE 2000 ®CHARGE AND DISCHARGE CKT
24 OR 48 VOLTS, 600 AMPERES MAXIMUM
J-85500C, H589-411

DWG SIZE	ISSUE
2S	7B

AT&T	SD-82649-01	SHEET A1 OF 23

FS 1

RECTIFIERS AND XCS CONTROLLER
FOR "LINEAGE" ® 2000 SMALL CONTROLLER



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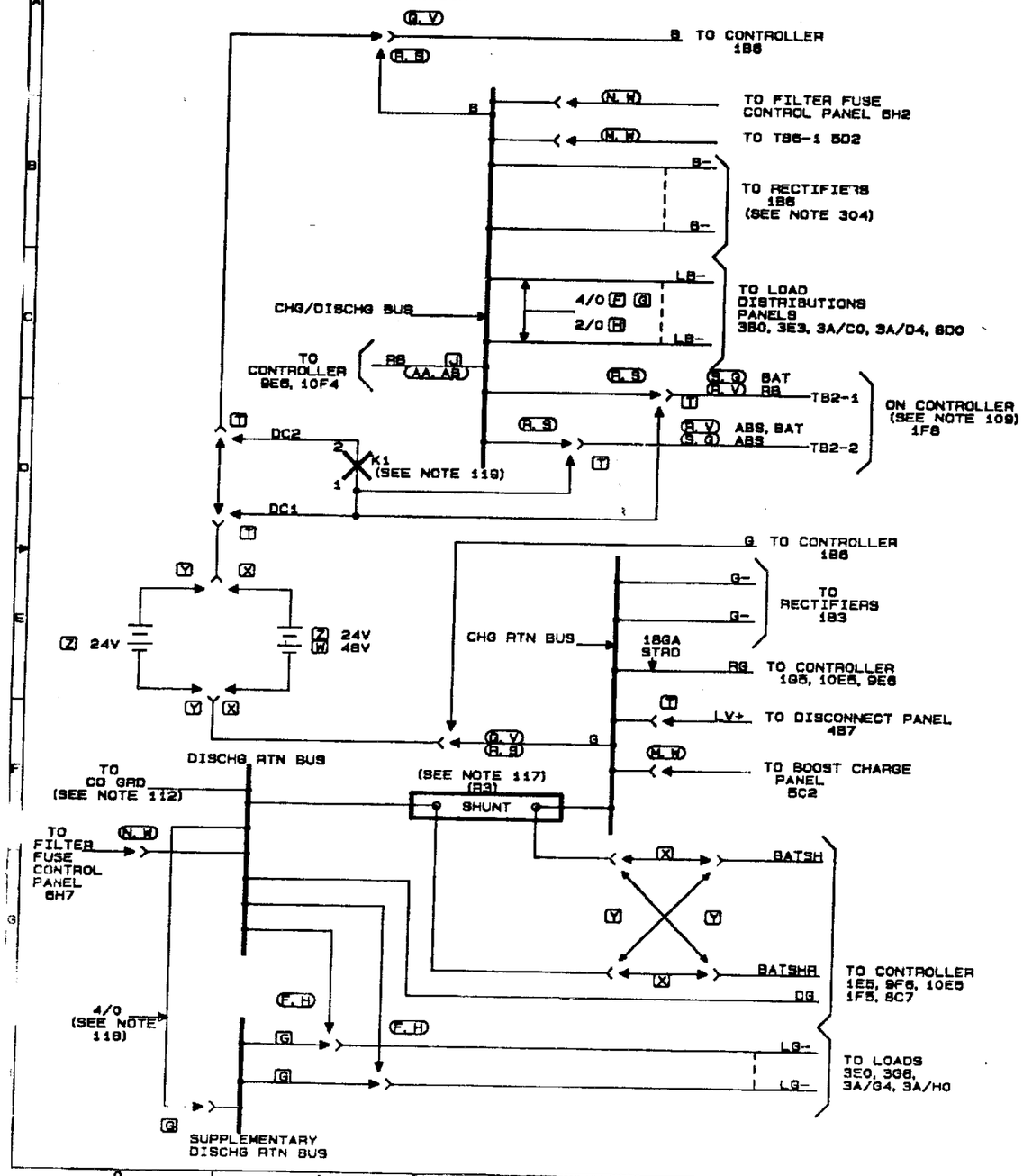
LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82644-01		SHEET 81

FS 2

BATTERY DISTRIBUTION



LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J85500C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01	SHEET 82

PART OF FS 3

LOAD DISTRIBUTION PANELS

PANEL BATTERY BUS

FUSE DISTRIBUTION PANEL KS-14473, L3 OR KS-16384, L1

LOAD- F-

1/2 AMP

FAJ - 1K

FAJ — TO OTHER FUSE & CKT BKR DIST PANELS (SEE NOTE 110) AND/OR 383, 3A/A3, 3A/E8, 837

FAJ — TO CONTROLLER (SEE NOTE 110) 1E8, 9E8, 10G7

2; 2/0 H
2; 4/0 F G

TO CHG/DISCHG BUS 2C3

LB-

- AMP

LOAD- F-

1/2 AMP

- AMP

P

TO LOADS AS REQUIRED (SEE NOTE 118)

PANEL RTN BUS (SEE NOTE 204) H

H

H

H

F G

F G

2H3

LG-

LG-

PART OF FS 3

KS-22012 CIRCUIT BREAKERS
(CIRCUIT BREAKER SHOWN IN "OFF" POSITION)

TO EXTERNAL SHUNT MONITORING CIRCUIT (SEE NOTE 115)

WI- TP, 20GA

1/2 A 20GA

1/2 A 20GA

PUSHBUTTON CHARGE SWITCH

11 10

CBA1- 15GA CBA-

CBA — TO CAP CHG PANEL OR CBA1 OF OTHER CKT BRKR PANEL 7E0

THRU INTERMEDIATE SWITCHES

CBA1 — TO CBA OF OTHER CIRCUIT BREAKER PANEL 3A/G9

CB-

LOAD

15GA STD

BK W

K K

2

d P

L L

12 13

SHUNT

11 10

15GA

TO LOADS AS REQUIRED (SEE NOTE 118)

2, 4/0 F G
2, 2/0 H

TO CHG DCHG BUS 2C3

LB-

1

8 9

TO TB4-3 OF CAP CHG PANEL (LAST CKT BKR ONLY) 7D0

CF P 15GA

TO INT CKT BKRS

CB-

LOAD P 15GA

TO OTHER FA CKT BKR PANEL 3A/F4

BUS BAR

K K

2

d P

L L

12 13

SHUNT

TB5

1

FAJ- 1K

8 9

2

FAJ

FAJ

3

TO CONTROLLER AND/OR OTHER DISTRIBUTION PANEL (SEE NOTE 110) 1E6, 9E8, 10G7, 3A3, 3A/A3, 3A/E8, 8E7

TRIPPED BREAKER ALARM SWITCH CLOSED WHEN BREAKER IS TRIPPED BY OVERCURRENT

(BK) (W) 20GA

2H3 LG- LG-

TO EXTERNAL SHUNT MONITORING CIRCUIT (SEE NOTE 115)

1/2 A

1/2 A

TP, 20GA WI-

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LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J88500C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01	SHEET 83

PART OF FS 3

LOAD DISTRIBUTION PANEL
37A FUSE ASSEMBLY
(SEE INFORMATION NOTE 302
AND CIRCUIT NOTE 114)

FS-
FS-
FS-

P/O PANEL BATTERY BUS

TO CHARGE/ DISCHARGE BUS 2C3 — LB- — 4/0 2, 2/0

FAJ — TO OTHER FUSE OR CKT BKR DIST PANELS (SEE NOTE 110) 3A3, 3G3, 3A/E8, 8E7

AL1- — TO ED-82947-30, G1 CONTROL PANEL (SEE NOTES 111, 113 AND 305) 6A2, 6A4

FAJ- 1000 — FAJ — TO CONTROLLER (SEE NOTE 110) 1E8, 9E8, 10G7

P

ONC

ONC

TO LOADS AS REQUIRED

TO TB4-3 OF CAP CHG PANEL (LAST CKT BKR PANEL ONLY) 7D0

(N, H) ED-83182-30, G5 (DA)

P/O PANEL BATTERY BUS

F2A 2A 30A
F1A 2A 30A

AL2- 1000

TO ED-82947-30, G1 CONTROL PANEL (SEE NOTES 111, 113 AND 305) 6A8, 6A7

R1- 31Ω — C1- 72,000
R2- 31Ω — C2- 72,000

PANEL RTN BUS (SEE NOTE 204)

TO DISCHG RTN BUS 2H3 — LG-

INTERMEDIATE CONNECTIONS AS REQUIRED

PART OF FS 3

KS-22010 CIRCUIT BREAKERS

2, 4/0 — 2, 2/0 — LINE — CB1 — LOAD — CB1

TO CHG/ DCHG BUS 2B3 — LB-

PANEL BATTERY BUS — CF 18GA

TO INT CKT BRKRS

CB15 — LINE — LOAD — CB15

TO LOADS AS REQUIRED (SEE NOTE 118)

TO OTHER FUSE & CKT BKR DIST PANELS (SEE NOTE 110) AND OR 3A3, 3G3, 3A/A3, 8E7

TO OTHER CKT BKR PANEL 3F3 — FA

FAJ- 1K — FAJ — TO CONTROLLER (SEE NOTE 110) 1E8, 9E8, 10G7

FC1 … FC15

(SEE NOTE 204) PANEL RTN BUS

2, 2/0

2H3 — LG- — LG-

S2 LOAD SELECT SWITCH 18GA

S1 MOMENTARY CHARGE SWITCH CBA

TO CAP CHG PANEL OR CBA1 OF OTHER CKT BKR PANEL 3D9, 7E0

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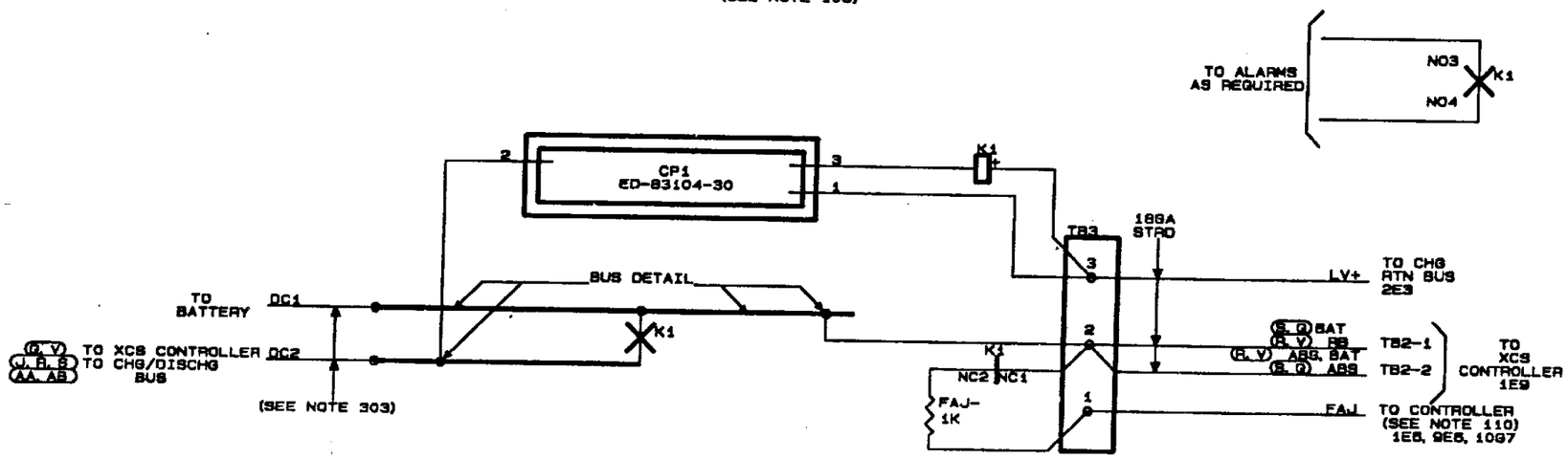
RED ORIGINAL

LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2E	ISSUE 7B
AT&T	SD-82849-01		SHEET B3A

FS 4

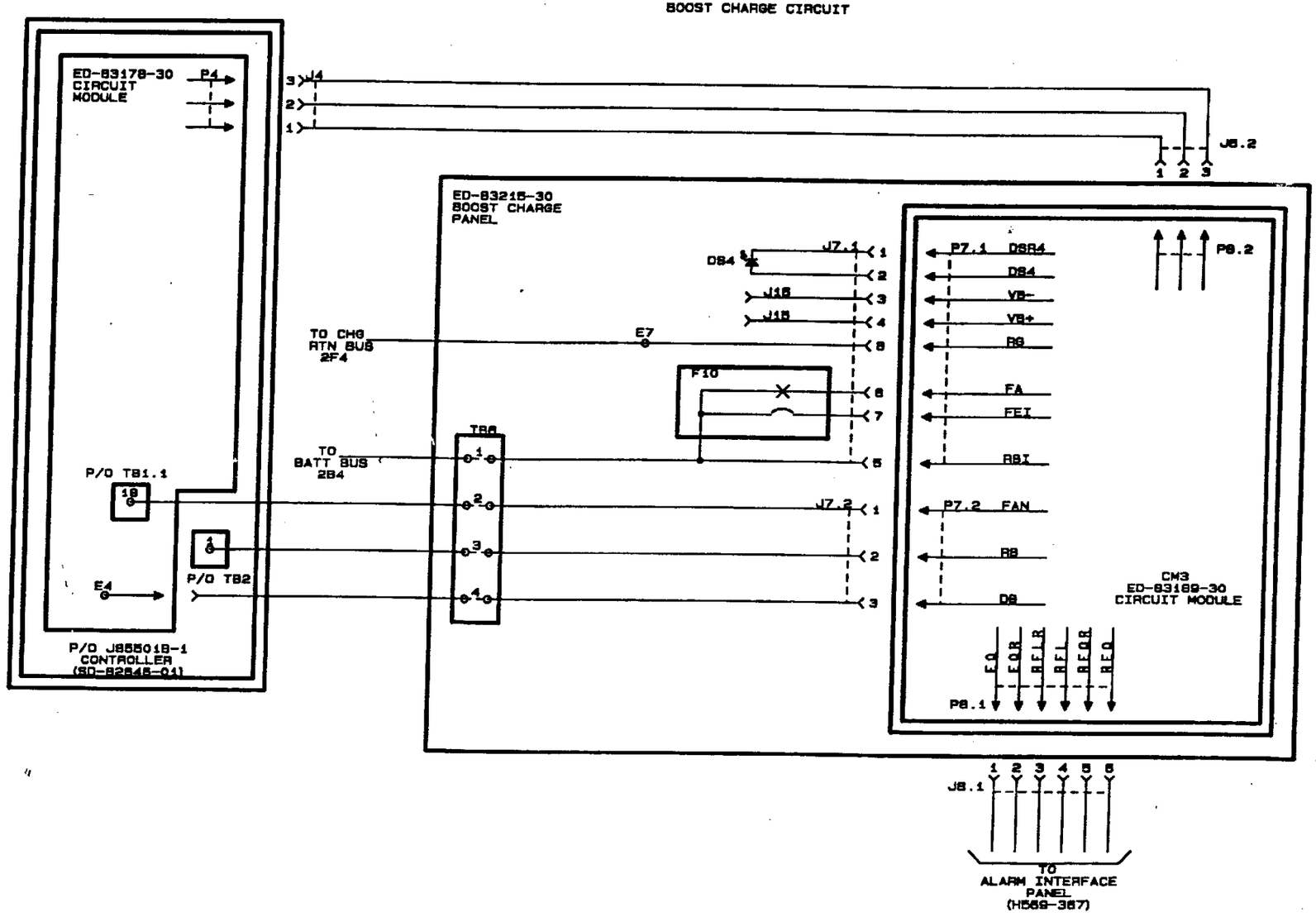
LOW VOLTAGE BATTERY DISCONNECT CIRCUIT
(SEE NOTE 108)



LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01		SHEET 84

N.W : FS 5

BOOST CHARGE CIRCUIT



LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET 85

(N.H) FS 6

ED-82947-30, 81
FILTER FUSE CONTROL PANEL
(SEE NOTES 111, 305 AND 307)

3A/B3 3A/B3 3A/F3 3A/F3

P/O J1.1 MNJ(A) MNJ(B) MN(A) MN(B)

TO OFFICE ALARM CIRCUIT

MNV(B) R
MNV(B)
MNV(A) R
MNV(A)
MJV(B) R
MJV(B)
MJV(A) R
MJV(A)
MN(B) R
MN(B)
MN(A) R
MN(A)
MNJ(B) R
MNJ(B)
MNJ(A) R
MNJ(A)

TO ALARM SENSING CIRCUIT OR REMOTE MASTER SCANNER

S2(B) R
S2(B)
S2(A) R
S2(A)
S1(B) R
S1(B)
S1(A) R
S1(A)

P/O J1.1

CM2
ALARM CIRCUIT
ED-82949
(FS)

CM1
CHARGE CIRCUIT
ED-82950

(FS)

P/O J1.1

CR2.1 CR1.1 CR3.1
FF3.1
FF2.1 FF1.1
R11
AT

P/O J2.1

186A

E1 AT

TO CHG/DISCHG BUS 2B3

TO DISCH RTN BUS 2F0

SHEET NOTES:

1. COMPONENTS IN FS6 ARE SHOWN FOR INTERCONNECTION PURPOSES ONLY. REFER TO SD-82518-02 FOR LATEST COMPONENT INFORMATION.

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MAR 31 1994
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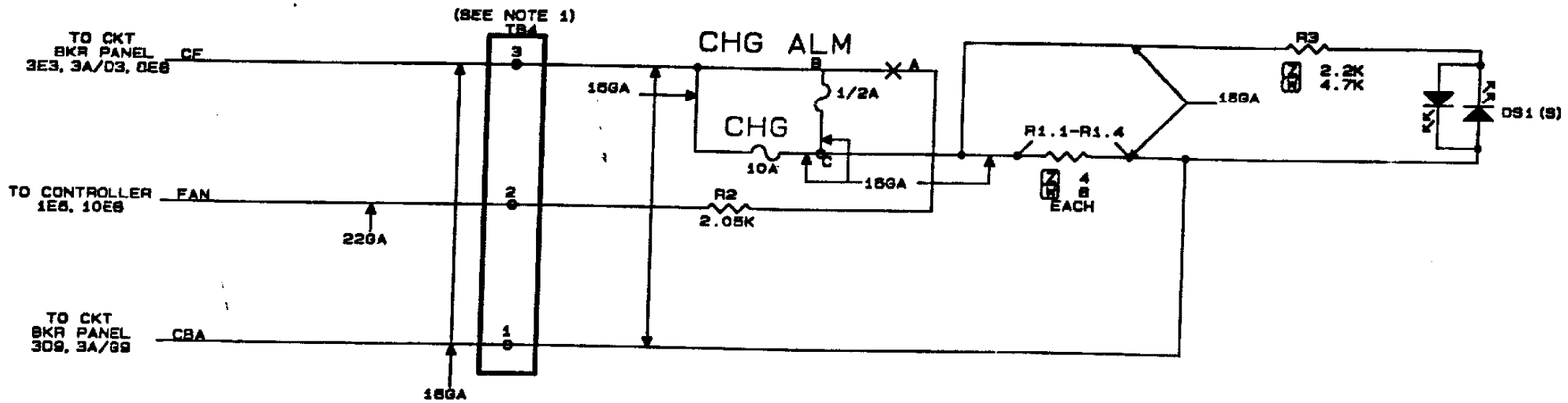
LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET 86

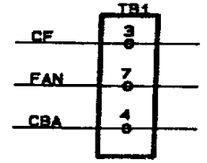
FS 7

FILTER CHARGER



NOTES:

1. TERMINAL BLOCK TB4 NUMBERING SHOWN. IF TERMINAL BLOCK IS DESIGNATED TB1, THE FOLLOWING NUMBERING SCHEME IS USED.



LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET B7

FS 8

LOW-VOLTAGE LOAD DISCONNECT

NOTES:

1. THESE ALARM LEADS CAN BE CONNECTED ACCORDING TO OFFICE REQUIREMENTS TO THE SI ALARMS. FOR THIS APPLICATION THEY ARE CONNECTED TO THE SI(A) LEADS AND UNDER THESE CONDITIONS, PROVIDE A MINOR ALARM ISSUED AS A SD ALARM. THE LINEAGE XCS CONTROLLER PROVIDES NO DIAGNOSTICS FOR THIS PARALLEL ALARM.
2. ALL WIRING IS 22GA STRANDED EXCEPT WHERE NOTED.

WI – TP, 20GA

TO EXTERNAL SHUNT MONITORING CIRCUIT (SEE NOTE 115)

1/2A

1/2A

20GA

BK

W

SHUNT

CB1

POLE A

POLE B

CR1

P/O DSCHG RETURN BUS BAR

TO LOADS AS REQ'D

TO CHG/DISCHG BUS IN INITIAL BAY OR IN XCS CONTROLLER (SD-82646-01) 2B3

LB –

BUS DETAIL

CM1

P/O J1

P/O P1

P2

TB2 1

1 DISCHG RTN — TO DISCH RTN BUS IN INITIAL BAY OR IN XCS CONTROLLER (SD-82646-01)

2 SI(A) — TB1.2-15

3 SIR(A) — TB1.1-15

ON XCS CONTROLLER (SD-82646-01) (SEE NOTE 1)

TB2 2

1 CF — TO TB4-3 OF CAP CHARGE PANEL (LAST CKT BKR PANEL ONLY) 700

2 FAJ

3 FAJ — TO CONTPOLLER AND/OR OTHER DISTRIBUTION PANEL (SEE NOTE 110) 1E6, 9E6, 10G7, 3A3, 3G3, 3A/A3, 3A/E8

FAJ – 1K

CB2

POLE A

POLE B

CR2

SHUNT

BK

W

20GA

1/2A

1/2A

TO EXTERNAL SHUNT MONITORING CIRCUIT (SEE NOTE 115)

TP, 20GA WI –

P/O DSCHG RETURN BUS BAR

TO LOADS AS REQ'D

SPECIAL

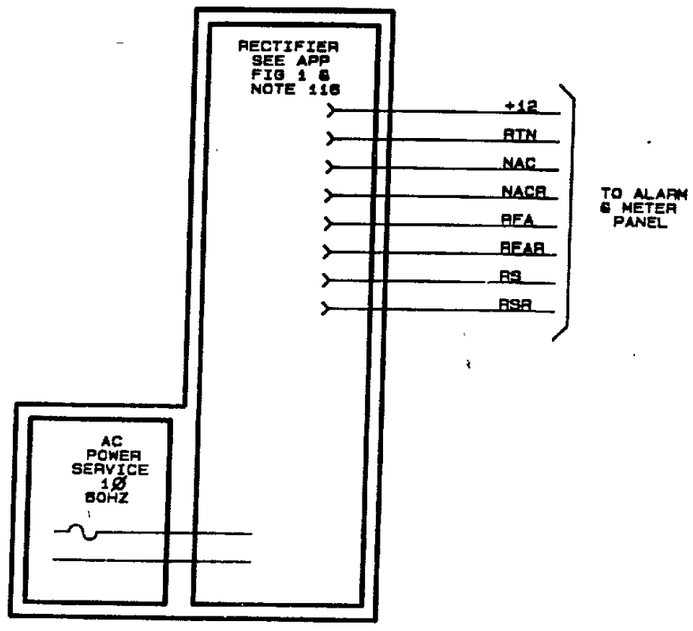
MAR 31 1994

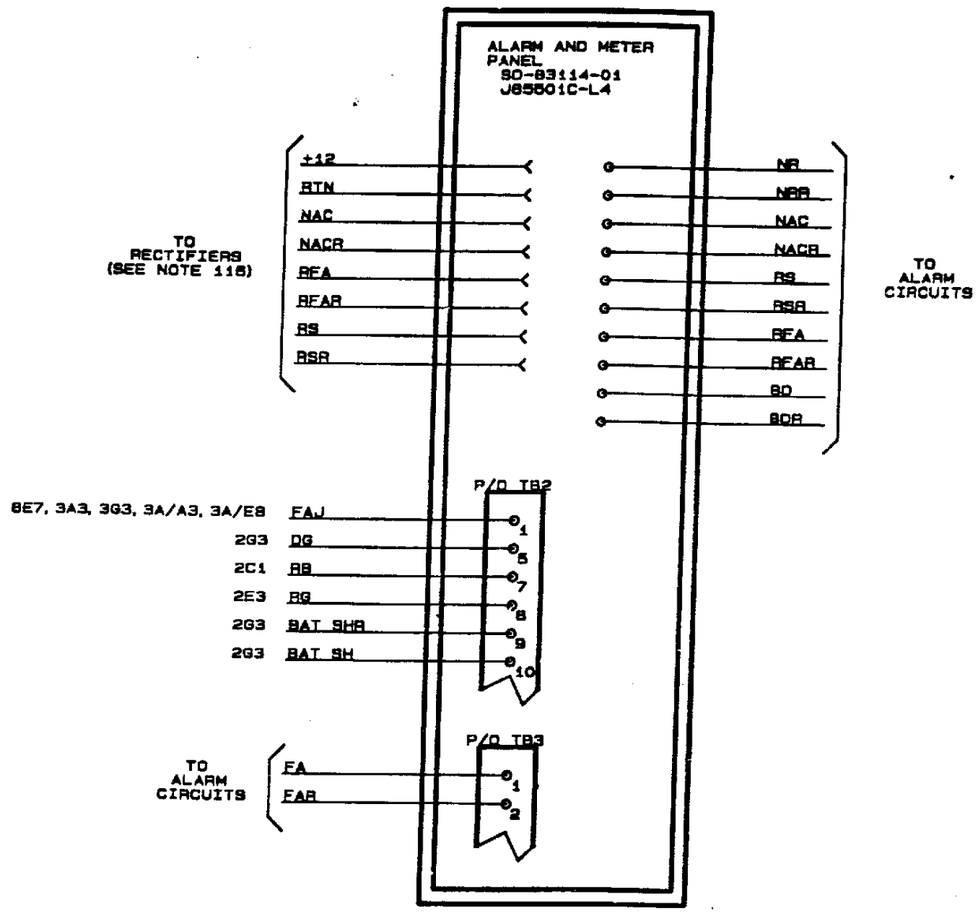
RED ORIGINAL

LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J855000C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET 88

FS 9

RECTIFIER WITH ALARM AND METER PANEL

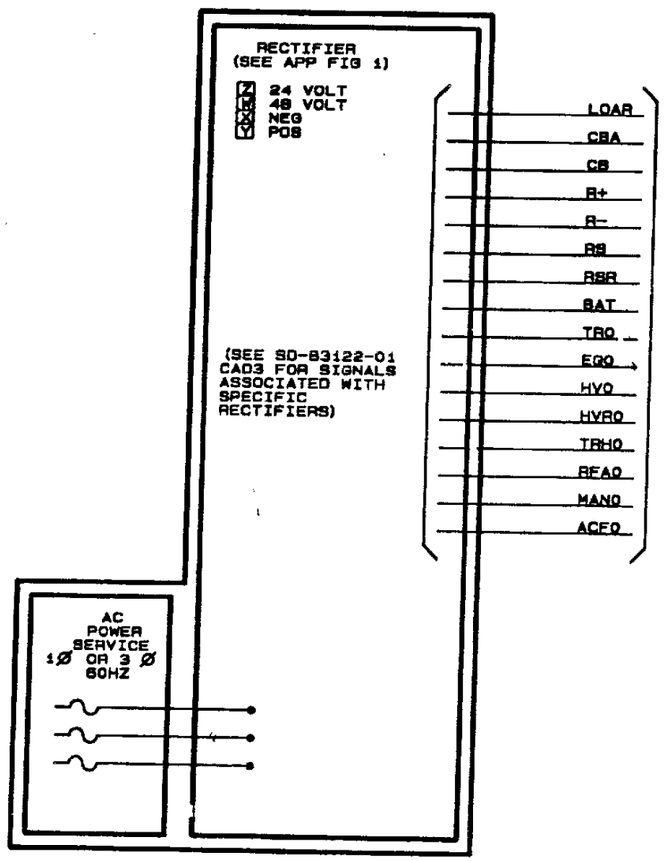


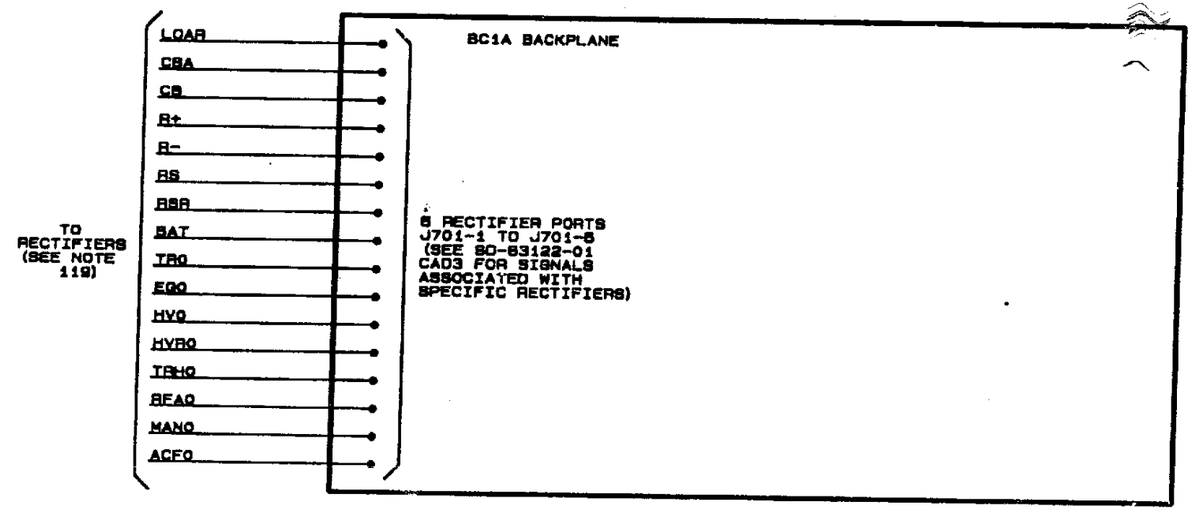


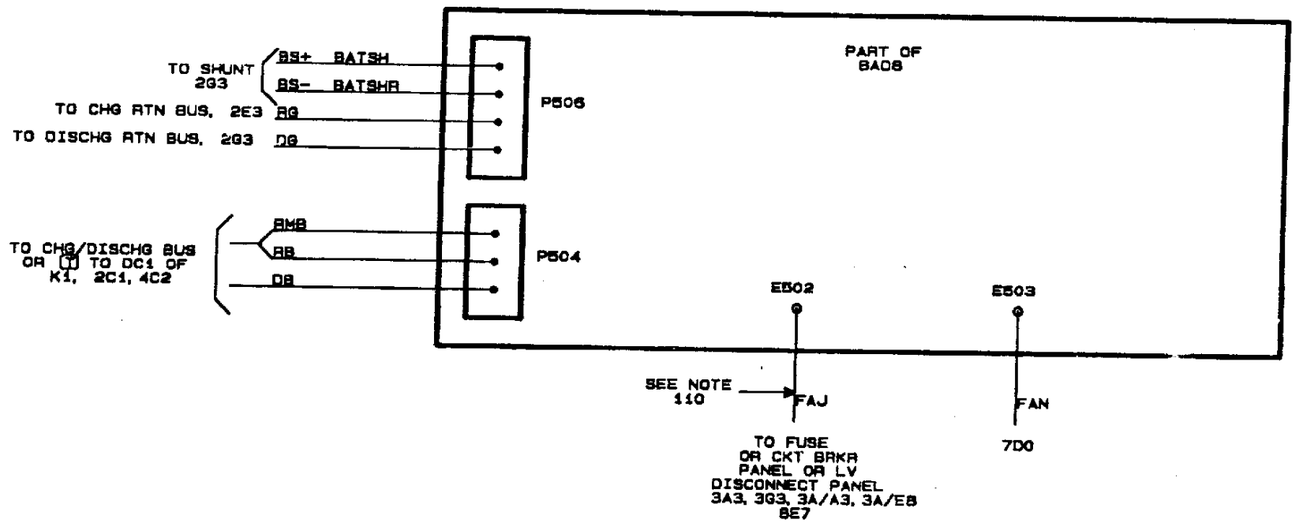
LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82849-01		SHEET 89

FS 10 (AA) (AB)

RECTIFIERS AND CONTROLLER
FOR J85501E-1 CONTROLLER (ECS-6U)
(P/O SD-83122-01)







LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01		SHEET 810

APP FIG. 1
(FS1, FS2, FS3, FS9, FS10)

CIRCUIT BREAKER

DESIG	LOC	CODE
CB-	3D5	KS-22010, AS REQ'D
CB-	3F5	KS-22012, AS REQ'D

CAPACITOR

DESIG	LOC	CODE
(N, W) C1	3A/G1	36DE723G060DF2A, 72,000 (SPRAGUE)
(N, W) C2	3A/H1	36DE723G060DF2A, 72,000 (SPRAGUE)

CONTROLLER

DESIG	LOC	CODE
(S, R, Q, V) XCS	1A7	J85501B
(J) ALM PANEL	9B7	J85501C, L4
(AA, AB) ECS-6U	10B6	J85501E-1

FUSE

DESIG	LOC	CODE
(N, W) F1-	3A/G1	KS-19780, L6, 30A
(N, W) F1A-	3A/G1	70B, 2A E/W 18A FUSE HOLDERS
(N, W) F2	3A/F1	KS-19780, L6, 30A
(N, W) F2A-	3A/F1	70B, 2A E/W 18A FUSE HOLDERS

FUSE HOLDER

DESIG	LOC	CODE
LOAD	3D5	KS-14475, L3 FOR 31 TO 60 AMP FUSES E/W 70G ALM FUSES KS-16364, L1 FOR 1 TO 30 AMP FUSES E/W 70G ALM FUSES
LOAD	3F5	37A FUSE BLOCK FOR 74 TYPE OR KS-19780 FUSES E/W 70G ALM FUSES
LOAD	3A/D5	

RECTIFIER

DESIG	LOC	CODE
(S, R, Q, V) (AA, AB) -	1A1, 10B1	J87439A, L1 OR L2 E/W L8 & LC J87438A, L1 OR L2 E/W L8 & LC J87437A, L1 OR L2 E/W L8 & LC J87436A, L1 OR L2 E/W L8 & LC } SEE NOTE 20B
		J87435A, L1 (SEE NOTE 10B) J87434A, L1 (SEE NOTE 10B) J85502A, B OR C E/W L-WB J85503A OR B E/W L-WB
(J)	9B1	J85502A, L2 J85502B, L2 J85502C, L2 } SEE NOTE 11B

RESISTOR

DESIG	LOC	CODE
(N, W) AL2-	3A/F2	KS-20288, L1A, 100Ω
FAJ-	3A/B2, 3A/F5, 3G3	KS-14603, L1A, 100Ω
(N, W) R1-	3A/G1	KS-14603, L5CD, 31Ω
(N, W) R2-	3A/G1	KS-14603, L5CD, 31Ω

SHUNT

DESIG	LOC	CODE
R3	2F2	A-50-50, EMPRO
R3		A-100-50, EMPRO
R3		A-150-50, EMPRO
R3		A-200-50, EMPRO
R3		A-300-50, EMPRO
R3		A-400-50, EMPRO
(F, G) R3		A-600-50, EMPRO (SEE NOTE 117)

SWITCH

DESIG	LOC	CODE
(P) S1	3A/G8	1803, 1221 OR 1803, 1202 FROM MARQUARDT 57 ALBANY STREET CAZONOVIA, NY (E) 399622-L OAK SWITCH OR (D) 2APA06500297 (CRL)
(P) S2	3A/G8	

NOTE: IF A 2APA06500297 SWITCH IS BEING ORDERED AS A REPLACEMENT FOR A 399622-L SWITCH AN ED-83182-30 GROUP G MUST BE ORDERED.

TERMINAL BLOCK

DESIG	LOC	CODE
TB5	3G3	799-3-KT28-KT39 (KULKA)

(T) APP FIG. 2
(FS4)

RELAY

JFA4011A, HB PRODUCTS DIV. OF PRESTOLITE TOLEDO, OHIO

	K1	
	4B6	
NO3 NO4	4A8	
	4C4	
NC2 NC1	4C6	

CIRCUIT BOARD

DESIG	LOC	CODE
CP1	4B4	ED-83104-30, GROUP ( ) SEE NOTE 10B

RESISTOR

DESIG	LOC	CODE
FAJ-	4C7	KS-14603, L1A, 1K

TERMINAL BLOCK

DESIG	LOC	CODE
TB3	4C6	799-3-KT28-KT30 (KULKA)

(N, W) APP FIG. 3
(FS5)

CIRCUIT MODULE

DESIG	LOC	CODE
CM3	5B6	ED-83189-30

CONNECTOR

DESIG	LOC	CODE
J4	5A2	640440-3, AMP
J7.1	5C5	640440-8, AMP
J7.2	5D5	640440-3, AMP
J8.1	5F6	640440-8, AMP
J8.2	5B7	640440-3, AMP
J15	5C4	KS-20857, L2
J16	5C4	KS-20857, L3

DIODE

DESIG	LOC	CODE
DS4	5C4	KS-21320, L1, SOCKET E/W 531E DIODE

FUSE

DESIG	LOC	CODE
F10	5D4	18A FUSEHOLDER E/W 70F FUSE

TERMINAL

DESIG	LOC	CODE
E7	5C4	2165-1A, GLASTIC

TERMINAL BLOCK

DESIG	LOC	CODE
TB6	5D3	KS-20856, L48

LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET C1

E/W APP FIG. 4
(FS8)

CIRCUIT BREAKER

DESIG	LOC	CODE
CB1	8C3	GJ2-Z10-3, (48V, 125A), HEINEMAN GJ2-Z10-4, (48V, 150A), HEINEMAN GJ2-Z10-5, (48V, 175A), HEINEMAN GJ2-Z10-6, (48V, 200A), HEINEMAN GJ2-Z10-7, (48V, 225A), HEINEMAN GJ2-Z10-8, (48V, 250A), HEINEMAN
CB2	8F3	GJ2-Z10-3, (48V, 125A), HEINEMAN GJ2-Z10-4, (48V, 150A), HEINEMAN GJ2-Z10-5, (48V, 175A), HEINEMAN GJ2-Z10-6, (48V, 200A), HEINEMAN GJ2-Z10-7, (48V, 225A), HEINEMAN GJ2-Z10-8, (48V, 250A), HEINEMAN

CIRCUIT MODULE

DESIG	LOC	CODE	DISCONNECT VOLTAGE
CM1	8D4	118A-1	41.39V
		118A-2	42.25V
		118A-3	43.11V
		118A-4	44.02V
		118A-5	44.95V

CONNECTOR

DESIG	LOC	CODE
J1	8D4	87159-5, AMP
J2	8D5	87159-3, AMP

DIODE

DESIG	LOC	CODE
CR1	8C3	813B
CR2	8G3	813B

FUSE & CABLE ASSEM

DESIG	LOC	CODE
W1-	8A0, 8B1	H285-224, L77-L80 (SEE NOTE 1) EQUIPPED WITH AGC 1/2A, BUSSMAN OR EQUIV.

RESISTOR

DESIG	LOC	CODE
FAJ-	8F8	KS-14603, L1A, 1K

SHUNT

DESIG	LOC	CODE
AS REQ'D	8B1, 8F1	1471-125-25, EMPRO 1472-150-25, EMPRO 1473-175-25, EMPRO 1474-200-25, EMPRO 1475-225-25, EMPRO 1484-250-25, EMPRO

TERMINAL BLOCK

DESIG	LOC	CODE
TB7.1	8D7	799-3-KT28-KT30 (KULKA)
TB7.2	8E7	799-3-KT28-KT30 (KULKA)

NOTE:

1. THE LIST NUMBERS REPRESENT CABLE LENGTHS:
   L77 & L81 - 9' 11"
   L78 & L82 - 4' 2"
   L79 & L83 - 3'
   L80 & L84 - (SPECIFY LENGTH)

B APP FIG. 5
(FS7)

FILTER CHARGE PANEL

DESIG	LOC	CODE
FILTER CHARGE PANEL	7D3	ED-83188-30, G1 OR ED-83108-30, G1

E/W

DIODE (LIGHT EMITTING)

DESIG	LOC	CODE
OS1 (S)	7D6	558A OR 4301H1/1 RED (IDI)

FUSE

DESIG	LOC	CODE
CHG FUSE	7D3	10 AMP 8AN, BUSSMAN
CHG FUSE ALM	7D3	70G, 1/2 AMP

RESISTOR

DESIG	LOC	CODE
[4] R1.1-R1.4	7D4	KS-14175, L3C, Z 4, H 8
R2	7D3	KS-20289, L6C, 2.05K
R3	7C6	KS-20289, L6C, Z 2.21K, H 4.7K

TERMINAL STRIP

DESIG	LOC	CODE
TB4	7D2	799-3-KT28-KT30, (KULKA)

LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01		SHEET C2

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER

BATTERY SYMBOL	GROUND SYMBOL	VOLTAGE RANGE
⊥ / ⊤	⏚	

102.

FEATURE OR OPTION	PROVIDE APP FIG	PROVIDE APP OR WRG	PROVIDE QTY
24 VOLT PLANT		Z	
48 VOLT PLANT		W	
POSITIVE PLANT		Y	
NEGATIVE PLANT		X	
J855018, LIST 1 CONTROLLER (BASIC CONTROLLER)		S	
J855018, LIST 2 CONTROLLER (EXT SHUNT/INT REG FUSES)		R	
J855018, LIST 3 CONTROLLER (INTERNAL SHUNT & AND DIST. FUSES)		Q	
J855018, LIST 4 CONTROLLER INTERNAL SHUNT & REG FUSES		V	
LOW VOLTAGE BATTERY DISCONNECT	2	T	
FUSE-FILTER PANEL	1	N	
BOOST CHARGE CIRCUIT	3	M	
LOW VOLTAGE LOAD DISCONNECT PANEL	4	U	
CAPACITOR CHARGE PANEL	5	P	
CIRCUIT BREAKER EQUIPPED WITH INTERNAL SHUNT		L	
CIRCUIT BREAKER WITHOUT INTERNAL SHUNT		K	
J85501C, LIST 4 -48V ALARM AND METER PANEL		J	
400A PLANT DISCHARGE CAPACITY		H	
600A SUPPLEMENTARY DISCHG RETURN BUS		G	
600A PLANT DISCHARGE CAPACITY		F	
J85501E-1, LIST 1 CONTROLLER (-48V)		AA	
J85501E-1, LIST 2 CONTROLLER (+24V)		AB	

CIRCUIT NOTES: (CONT)

103.

RECORD OF APP FIGURES, WIRING AND APPARATUS CHANGES						
CHANGED ON ISSUE	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT AVAIL		DA
38	L OR K	K		L, K		
48	G, F / J	H / S, R, Q, V	117	G, F / J, S, R, Q, V		H, N
58	D	E		D		E

104. RECTIFIER POLARITY OPTIONS SHALL BE FURNISHED TO MATCH PLANT POLARITY OPTIONS.

105. EACH FUSE PANEL AND CIRCUIT BREAKER PANEL SHALL BE EQUIPPED WITH ITS OWN FAJ RESISTOR.

106. RECTIFIERS ARE CONNECTED TO THE J855018 CONTROLLER IN GROUPS OF TWO. J87434 OR J87435 SERIES OF 35 AMP RECTIFIERS CANNOT BE MIXED IN A GROUP OF ANY OTHER SERIES OF RECTIFIER.

107. SHUNT LEADS COMING FROM THE EXTERNAL SHUNTS SHALL BE SIZED SO THAT THEIR TOTAL RESISTANCE FROM THE EXTERNAL SHUNT TO TB1.1 AND TB1.2 SHALL NOT EXCEED 500 MILLIOHMS.

108. THE LEVEL AT WHICH THE DISCONNECT CIRCUIT OPERATES IS CONTROLLED BY A GROUP NUMBER AS FOLLOWS:

GROUP NUMBER	DISCONNECT LEVEL
2, J	40.56 ± 0.25 VOLTS
2, K	41.39 ± 0.25 VOLTS
2, L	42.25 ± 0.25 VOLTS
2, M	43.11 ± 0.25 VOLTS
2, N	44.02 ± 0.25 VOLTS
2, P	44.95 ± 0.25 VOLTS

109. IF T OPTION IS EQUIPPED WITH EITHER Q OR V OPTION, THEN THE BAT, RB AND ABS LEADS WILL BE TERMINATED AT THE BATTERY SIDE OF THE K1 CONTACTOR CONTACTS INSTEAD OF IN THE J855018 CONTROLLER.

110. THE CONTROLLER WILL ACCEPT ONLY ONE FAJ- LEAD. THE VARIOUS FAJ- LEADS SHALL BE MULTED TOGETHER ON THE FUSE/CKT BKR PANELS AND BROUGHT TO THE CONTROLLER BY A SINGLE LEAD.

111. FUSE-FILTER PANELS (ED-83182-30, GRP-1, 5) MAY BE EQUIPPED IN PAIRS, AS REQUIRED, UP TO A MAXIMUM OF THREE (3) PAIRS OF PANELS. THE PANELS SHALL BE DESIGNATED A.1 AND B.1, FOR THE FIRST PAIR, THROUGH A.3 AND B.3 FOR THE THIRD PAIR. THE LOAD FUSE ALARM (AL1-) SHALL BE WIRED FROM EACH PANEL TO THE CORRESPONDING TERMINAL OF TS1.1 OR TS2.1 OF THE CONTROL PANEL (ED-82947-30, G-1), E.G. FROM PANEL B.2 TO TS2.1-2 (AL1B.2). SIMILARLY THE CAPACITOR FUSE ALARM (AL2-) SHALL BE WIRED FROM EACH PANEL TO THE CORRESPONDING TERMINAL OF TS3.1 OR TS4.1.

112. ALL RETURN FEEDERS SHALL BE GROUNDED IN ACCORDANCE WITH AT&T PRACTICES 802-001-180 AND/OR 803-500-410.

113. THE MAXIMUM INPUT CURRENT FOR EACH FUSE-FILTER PANEL SHALL BE 275 AMPERES.

114. FUSES SHALL BE RATED AT 125% OF MAXIMUM LOAD CURRENT.

CIRCUIT NOTES: (CONT)

115. SHUNT LEADS MAY BE CONNECTED TO THE LINEAGE REMOTE ACCESS SYSTEM (SD-82645-01) OR TO ANOTHER EXTERNAL SHUNT MONITORING CIRCUIT. ALL EXTERNAL MONITORING LEADS CONNECTED TO THE CIRCUIT BREAKER SHUNTS SHALL CONTAIN 1/2A PROTECTION FUSES. THIS PROTECTION SHALL BE USED IN LIEU OF CURRENT LIMITING RESISTORS. FOR DETAILS ON CONNECTION TO THE REMOTE ACCESS SYSTEM REFER TO REMOTE ACCESS SYSTEM PRODUCT MANUAL, SELECT CODE 115-003.

116. THE MAXIMUM NUMBER OF RECTIFIERS CONNECTABLE TO THE J85501C-L4 ALARM AND METER PANEL IS THREE. THE RECTIFIER MUST BE SINGLE PHASE AND SHALL BE J85502A, B AND C CONFIGURED FOR -48 VOLT OPERATION.

117. THE A-600-50 EMPRO SHUNT HAS BEEN ADDED TO THE DRAWING. THE ASSOCIATED 600A METER IS LOCATED ON THE J855018, XCS CONTROLLER OR J85501E-1 ECS-6U CONTROLLER.

118. ONE 4/0 LEAD REQUIRED PER 200A CAPACITY. LEAD RESISTANCE TO BE INCLUDED IN EACH LOAD LOOP VOLTAGE DROP.

119. THE MAXIMUM NUMBER OF RECTIFIERS CONNECTABLE TO THE J85501E-1, ECS-6U CONTROLLER IS SIX. LIST 1, -48V; LIST 2, +24V; LIST 3, -24V.

EQUIPMENT NOTES:

201. ALL WIRING TO CM2 (ALARM CKT ED-82949) SHALL BE KS-22247, L4, 24GA.

202. ALL WIRING TO CM1 (CHARGE CKT ED-82950) SHALL BE KS-22247, L4, 20GA.

203. ALL WIRING NOT SPECIFIED SHALL BE KS-22247, L4, 20GA.

204. PANEL RTN BUS, AVAILABLE ON C1 BAY IS NOT AVAILABLE ON C2 BAY. IT HAS BEEN REPLACED WITH THE NEW EXTERNAL RTN BUS.

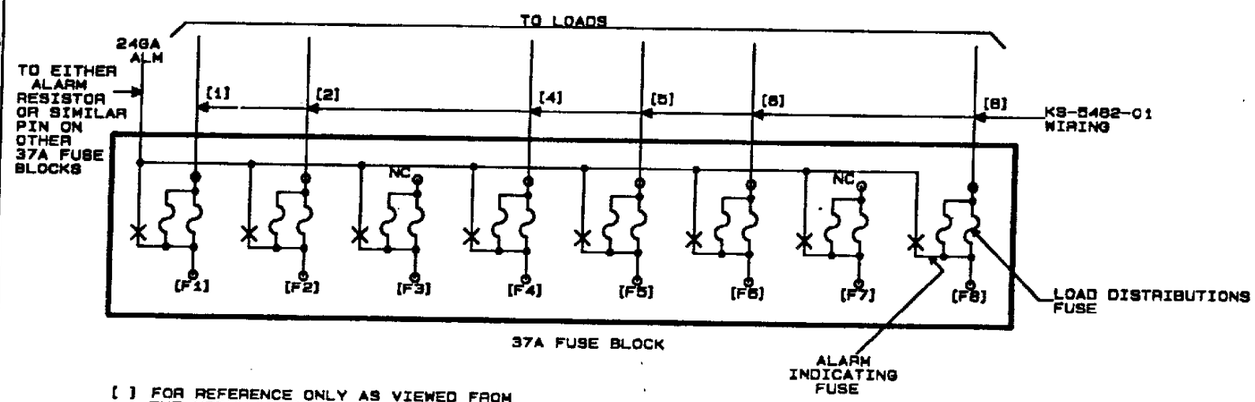
205. J87434 THRU J87439 RECTIFIERS ARE NO LONGER USED WITH THIS PLANT PER ISSUE 48 OF THIS DRAWING.

LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J85500C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01	SHEET D1

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR − (MINUS) ARE IN VOLTS.

302. WHEN ASSIGNING FUSES IN 37A FUSE BLOCKS, FOR EACH FUSE OVER 15 AMPERES AN ADJACENT FUSE POSITION IS TO REMAIN UNUSED AND DEDECATED TO ONLY THAT FUSE.



[ ] FOR REFERENCE ONLY AS VIEWED FROM THE WIRING SIDE OF THE APPARATUS

TYPICAL EXAMPLE:

FUSES F4 AND F8 ARE LARGER THAN 15 AMPS WIRING IS DONE TO SUIT JOB ASSIGNMENT. THE FRONT PANEL MARKING DESIGNATION STRIP FOR THE FUSE BLOCKS SHALL SHOW THE FUSES. SUCH AS F3 AND F7 DESIGNATED "NC" (NOT CONNECTED) WITH DUMMY FUSES MOUNTED IN THOSE UNUSED POSITIONS TO HELP RETAIN CAPS.

THE FUSING ASSIGNMENTS FOR A 37A FUSE BLOCK MUST FOLLOW THE GUIDELINES LISTED BELOW TO PREVENT THE FUSE BLOCK FROM DISSIPATING MORE POWER THAN IS RECOMMENDED (7.65 WATTS PER X-75533):

A. IF THE FUSING SCHEME IS MADE UP OF ONLY 74A, 74B, 74C, KS-19780-01, L1, L2, L4, L5 OR SMALLER FUSES, ALL POSITIONS (ALLOWING 2 POSITIONS FOR L4, L5) MAY BE ASSIGNED AND THE BLOCK WILL NOT DISSIPATE MORE THAN 7.65 WATTS.

B. IF THE FUSING SCHEME MATCHES ONE OF THE FOLLOWING COMBINATIONS, CHECK THE TOTAL LIST 2 CURRENT DRAIN THROUGH THE FUSES OF THE TABLE BELOW, REASSIGN THE LOADS.

FUSING SCHEME	KS-19780 FUSES						74 TYPE FUSES						MAX TOTAL CURRENT ALLOWED
	L6	L5	L4	L3	L2	L1	F	E	D	C	B	A	
1	4												88 AMPS
2				6									90 AMPS
3							4						81 AMPS
4								6					88 AMPS
5									8				81 AMPS
6	3	1											88 AMPS
7	3		1										88 AMPS
8	3			2									84 AMPS
9	3				2								84 AMPS
10	3					2							80 AMPS
11	1	3											84 AMPS
12		3		1									72 AMPS
13							3	2					81 AMPS
14							3		2				84 AMPS
15							3			2			80 AMPS
							3						56 AMPS

FUSE RATINGS: L6 IS 30 AMPS, L5 IS 25 AMPS, L4 IS 20 AMPS, L3 IS 15 AMPS, L2 IS 10 AMPS, L1 IS 5 AMPS, F IS 20 AMPS, E IS 15 AMPS, D IS 10 AMPS, C IS 5 AMPS, B IS 3 AMPS AND A IS 1.5 AMPS.

INFORMATION NOTES: (CONT)

302. (CONT)

C. FOR ALL OTHER POSSIBLE COMBINATIONS THE FUSING SCHEME FOR EACH 37A FUSE BLOCK MUST SATISFY THE FOLLOWING ALGEBRAIC EQUATION:

$$\sum_{n=1}^{8} .0038\,{}_nI^2{}_{L6} + .0035\,{}_nI^2{}_{L5} + .0047\,{}_nI^2{}_{L4} + .0070\,{}_nI^2{}_{L3}$$

$$+ .0125\,{}_nI^2{}_{L2} + .025\,{}_nI^2{}_{L1} + .0082\,{}_nI^2{}_F + .0097\,{}_nI^2{}_E$$

$$+ .0161\,{}_nI^2{}_D + .035\,{}_nI^2{}_C + .055\,{}_nI^2{}_B + .12\,{}_nI^2{}_A < 7.65$$

WHERE n IS AN INDEXER FOR THE NUMBER OF THE SAME TYPE OF FUSES USED IN THE BLOCK L6 THROUGH L1 AND F THROUGH A ARE USED TO IDENTIFY FUSE TYPE e.g. ${}_2I_{L5}$ IS THE LIST TWO CURRENT DRAIN THROUGH THE SECOND KS-19780, L5 FUSE IN THE FUSE BLOCK.

LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J85500C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01	SHEET D2

INFORMATION NOTES: (CONT)

303. THE G AND V OPTIONS PROVIDE FOR CHARGE AND DISCHARGE BUS BARS TO BE MOUNTED IN THE CONTROLLER. THE R AND S OPTIONS PROVIDE FOR BUS BARS TO BE MOUNTED EXTERNAL TO THE CONTROLLER. THE SIZE CONSTRAINTS OF THE BUS BARS ARE SUCH THAT RECTIFIERS UP TO 100 AMPERES IN SIZE CAN BE CONNECTED DIRECTLY TO THE CONTROLLER (G AND V OPTIONS), AND RECTIFIERS UP TO 200 AMPERES IN SIZE CAN BE CONNECTED EXTERNAL TO THE CONTROLLER (R AND S OPTIONS). MAXIMUM NUMBER AND SIZES OF CABLES THAT CAN BE APPLIED TO THE BUS ASSEMBLIES FOR RECTIFIERS, BATTERIES AND LOAD IS PROVIDED IN THE CHART SHOWN BELOW:

J855018 CONTROLLER LIST NO.	RECT		BATT***		LOAD** DIST.	PANEL
	NO.	AWG	NO.	AWG	NO.	AWG
1 - S OPTION	5	4/0	3	4/0	7	2/0
2 - R OPTION	5	4/0	3	4/0	7	2/0
3 - Q OPTION *	8	2	2	1/0	7	2/0
4 - V OPTION *	8	2	2	1/0	3	2/0
GROUP 1 LOAD FEEDERS	–	–	–	–	24	8
GROUP 2 LOAD FEEDERS	–	–	–	–	8	2
GROUP 3 LOAD FEEDERS	–	–	–	–	18	6

* THE CHG BATT BUS BAR CONFIGURATION OF J855018, L3 AND L4 CAN ACCEPT A MAXIMUM OF 9 CABLES. THESE CABLES CAN CONSIST OF ANY COMBINATION RECTIFIER, BATTERY AND DISTRIBUTION PANEL CABLES UP TO THE MAXIMUMS INDICATED. CHG GRD BUS CAN ACCEPT A MAXIMUM COMBINATION OF 8 CABLES.

** 2/0 AWG SHALL BE USED FOR ALL LOAD DISTRIBUTIONS.

*** THE NUMBER OF BATTERY LEADS INDICATED IS THE MAXIMUM NUMBER OF PARALLEL BATTERY STRINGS. MULTIPLE LEADS MAY BE USED FOR INDIVIDUAL STRINGS SUCH THAT THE TOTAL NUMBER OF LEADS DOES NOT EXCEED THE MAXIMUM INDICATED. THESE SAME CONSTRAINTS APPLY TO CONNECTIONS AT DC1 AND DC2 WHEN "T" OPTION IS APPLIED.

304. MINIMUM WIRE SIZE FOR RECTIFIER DC OUTPUT LEADS IS SPECIFIED BY THE RESPECTIVE RECTIFIER SCHEMATIC. THIS INFORMATION IS SHOWN BELOW:

RECTIFIER (AMP)	CABLE AWG
25	8
35	8
50	6
100	2
125	1/0
200	4/0

305. WARNING: REMOVAL OF THE CONTROL PANEL FF1 AND FF2 FUSES WILL DISABLE THE MINOR ALARM, ACO CIRCUIT, FRAME ALARM AND CHARGE CIRCUIT.

306. INSTRUCTIONS FOR USING THE CHARGE PROBE ARE AS FOLLOWS:

1. TO CHARGE THE LOAD CAPACITANCE ON EITHER BUS ( ) –

   a. INSERT THE CHARGE PROBE INTO THE INDICATING FUSE HOLDER (IF NOT PROVIDED – CHARGE AS PER STEP 2.

   b. PRESS THE "CAP CHG" SWITCH (S2) AND WAIT UNTIL THE "CAP CHG" LED EXTINGUISHES#).

   c. WHEN THE "CAP CHG" LED EXTINGUISHES AND THE "LOAD FAULT" LED IS ALSO EXTINGUISHED:

      1. INSERT THE LOAD FUSE.
      2. RELEASE THE "CAP CHG" SWITCH.
      3. REMOVE THE CHARGE PROBE.
      4. INSERT THE INDICATING FUSE.

INFORMATION NOTES: (CONT)

306. (CONT)

2. TO CHARGE THE PANEL FILTER CAPACITORS –

   a. INSERT THE CHARGE PROBE INTO THE FUSE HOLDER.

   b. PRESS THE "CAP CHG" SWITCH (S2) AND WAIT UNTIL THE "CAP CHG" LED EXTINGUISHES.

   c. WHEN THE "CAP CHG" LED EXTINGUISHES AND THE "LOAD FAULT" LED IS ALSO NOT LIGHTED:

      1. RELEASE S2.
      2. REMOVE THE CHARGE PROBE.
      3. INSERT THE LOAD FUSE WITHIN 12 SECONDS.

\# WARNING: IF THE "CAP CHG" LED EXTINGUISHES, BUT THE "LOAD FAULT" LED LIGHTS, A LOAD FAULT (SHORT CIRCUIT, OVERLOAD OR ANY CONDITION THAT KEEPS THE LOAD CAPACITORS FROM BEING CHARGED) CONDITION EXISTS.

307. ALARM FUNCTIONS:

REASON FOR ALARM	ALARM INDICATORS	ALARM CUT-OFF
LOAD FUSE OPERATED [F( )]	INDICATING FUSE OPERATES MAJOR ALM CONTACTS CLOSES	REMOVE INDICATING FUSE
FILTER FUSE HAS OPERATED OR REMOVED [FF( )]	FILTER FUSE ALM LIGHTS MINOR ALM CONTACTS CLOSES	PRESS THE ACO SWITCH (THE ACO LED WILL LIGHT AND REMAIN LIT UNTIL THE PROBLEM IS CORRECTED)
CHARGE CIRCUIT FAILED SHORT	INDICATING ALM LIGHTS OPERATES CHG CKT FAILED LIGHTS MINOR ALARM CONTACTS CLOSE	PRESS THE ACO SWITCH (THE ACO LED WILL LIGHT AND REMAIN LIT UNTIL THE PROBLEM IS CORRECTED OR THE REMOVAL OF FF3)
CONTROL PANEL OR CKT FAILS	INDICATING FUSE FF1 AND/OR FF2 OPERATES	PRESS THE ACO SWITCH (THE ACO LED WILL LIGHT AND REMAIN LIT UNTIL THE PROBLEM IS CORRECTED OR THE REMOVAL OF FF1 OR FF2)

LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J855002C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01	SHEET 03

CIRCUIT DESCRIPTION
CD-82648-01
DWG ISSUE: 7B

"LINEAGE" © 2000
CHARGE AND DISCHARGE CIRCUIT
24/48V, 600 AMPERES MAXIMUM
J85500C, H569-411

TABLE OF CONTENTS

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit provides a 24-cell (W-option) or 12-cell (Z-option) controlled float and recharge power plant. It also provides for a Low Battery Voltage Disconnect Circuit (T-option) whenever power has failed and the battery is going into deep discharge. When power is restored, the battery is automatically reconnected.

2. GENERAL DESCRIPTION OF OPERATION

2.01 The rectifiers are set to float the batteries and recharge them as required. Other values of float voltages can be accommodated by a coding switch in the controller. There are several backup systems in the plant that will monitor the battery and send alarms for high or low voltages. In the XCS Controller, if the battery voltage exceeds the upper limit of 53.00 +/- 0.5v (W-option) or 26.75 +/- 0.25v (Z-option), the plant will send a high-voltage shutdown to all rectifiers and send out a major alarm. The rectifiers with output current greater than 10% of rating will shut down; after shutdown, the HV disappears, a minor alarm is sent, and the controller's RFA LED will light.
If any distribution fuse or circuit breaker operates, a major alarm is sent and the controller's fuse alarm major LED will light.
The XCS Controller issues major alarms when the battery voltage drops to 51.25 +/- 0.5v (W-option) or 25.50 +/- 0.25v (Z option). For this low voltage condition, the controller's BD LED will light and the following alarms will be sent out:
SI(A), D, BD, PMJ and PMJV. If there is a power failure and the voltage continues to drop, the battery will be removed from the plant (T-option) at 43.1 +/- 0.25v.
The ECS-SU Controller has a range of High Voltage and Battery On Discharge alarm settings to select from. Refer to J85501E-1 drawing.

SECTION II - DETAILED DESCRIPTION

1. RECTIFIERS

1.01 FS1 illustrates a general-type rectifier with its associated leads. The plant, equipped with the J85501B XCS Controller, has the ability to accept all codes of J-coded ferro-resonant rectifiers ranging in size from 25 to 200A. The plant is also equipped to handle future series of rectifiers both single and three-phase. The plant can work with a combination of up to six rectifiers. The standard rectifier connections between the plant and the rectifier are as indicated below:

Designation	Meaning
B:	Main rectifier charging lead to battery.
BAT:	Provides battery to the rectifier. This battery supply is needed for operation of rectifier alarms.
CB/CBR:	Circuit breaker trip alarm.
G:	Main rectifier ground lead to battery.
HV:	Whenever the battery exceeds the limits because of high voltage, the voltage monitor in the control unit shuts down the rectifier.
LOA/LOAR:	A low voltage signal from the rectifier provides a closure which operates the RFA relay in the controller.
RB/RG:	The rectifier senses the battery voltage over these leads. The RB and RG leads are converted to R+ and R- in the rectifier.
RFA/RFAR:	When a rectifier fails, its RFA relay provides a closure that operates the RFA relay in the controller.
RS/RSR:	When a rectifier fails because of high voltage, the controller makes one attempt to start a rectifier over the RS lead. The RS relay in the controller operates.
TR/TRR:	Remote shutdown from engine control.

2. CHARGE/DISCHARGE, CHARGE GROUND AND DISCHARGE GROUND BUS BARS

2.01 FS2 shows the possible combinations of battery arrangements. The Charge/Discharge Bus, the Charge Ground and Discharge Ground Bus and the Shunt can be mounted in the XCS controller or external to the controller depending on the option chosen. The plant shunt can vary in size from 50 to 600A.

3. DISCHARGE CIRCUIT

3.01 FS3 shows the Discharge Circuit which consists of circuit breakers and/or fuses. The load is connected to these circuit breakers or fuses. If either should operate, a major alarm is transmitted through the FAJ lead to the XCS Controller (SD-82648-01) or ECS-SU (SD-83122-01). The circuit breakers will transmit an alarm only in the tripped position; this allows for turning off selected loads without having to disconnect the alarm leads.

4. LOW VOLTAGE BATTERY DISCONNECT CIRCUIT

4.01 FS4 shows the disconnect circuit that is used when the T-option is applied. The battery is connected to the Charge/Discharge Bus through the K1 contactor. In the event of a power failure, the rectifiers will lose power and the battery will begin to discharge. The monitor circuit, ED-83104-30, will monitor the battery voltage at the Charge/Discharge Bus and, when the voltage reaches 43.1 +/- 0.25v, it will remove the operate voltage from K1's coil. This will remove the battery from the plant. When power is restored and the rectifiers turn on, the monitor circuit will re-energize the K1 contactor and reconnect the battery.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 Input requirements for the rectifiers
Phase: Three-phase or single-phase

Frequency: 57 through 63 cycles

Input Voltage:

Nominal Tap (Volts)	Allowable Limits (Volts)
208	184 through 220
240	212 through 254

2. FUNCTIONAL DESIGNATIONS

2.01 LEADS

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

LINEAGE 2000 © CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01		SHEET E1

CIRCUIT DESCRIPTION
CD-82649-01
DWG ISSUE: 7B

"LINEAGE" ® 2000
CHARGE AND DISCHARGE CIRCUIT
24/48V, 600 AMPERES MAXIMUM
J85500C, H569-411

3. FUNCTIONS

3.01 (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-83122-01 ECS-6U Controller
SD-82648-01 XCS Controller
SD-82604-01 Rectifier
SD-82605-01 Rectifier

5. MANUFACTURING TESTING REQUIREMENTS

5.01 None.

SECTION IV - CHANGES

1. CHANGES

A. Changed and Added Functions

A.1 New and simpler and less costly controller is added.

A.2 Increased capacity of the plant to 600 amperes from 400 amperes (option P).

B. Changes in Apparatus

B.1 ADDED

Alarm & Meter Panel J85501C, L4, Controller, J Option - App Fig 1

Rectifiers: J85502A, L2, J85502B, L2, J85502C, L2, J Option - App Fig 1

R3 Shunt: A-600-50 EMPRO, F Option - App Fig 1

B.2 REMOVED

TB1.1, TB1.2, TB2 Terminal Blocks - App Fig 2

B.3

Superseded	Superseded by
FILTER CHANNEL PANEL ED-83188-30, GR1 - App Fig 5	FILTER CHANNEL PANEL ED-83188-30, GR1 or ED-83108-30, GR1 - App Fig 5

D. Description of Changes

D.1 The title of the schematic drawing and the circuit description was changed to reflect the change in the plant capacity (400 amperes changed to 600 amperes).

D.2 FS9 was added.

D.3 CADs 4 and 5 were added.

D.4 Option index table and Supporting Information were updated.

D.5 Reference to options F, G, H and J added to Circuit Note 102.

D.6 Circuit Note 103 updated for drawing issue 4B.

D.7 Reference to "J85501B" added to Circuit Notes 106 and 109.

D.8 Circuit Notes 112 and 115 revised.

D.9 Circuit Notes 116, 117 and 118 and Equipment Notes 204 and 205 were added.

D.10 Sheet Note 1 added on sheet 86.

D.11 Reference to 37A fuse block was changed from 25A fuse block in Information Note 302.

D.12 Lead designation "GRD" was changed to "RTN" in all FSs and CADs.

1.2 CHANGES

A. Changed and Added Functions

A.1 Option L has been added in FS3 to provide individual shunts for load monitoring the various load circuit breakers.

A.2 Option P has been added in FS3 to provide individual capacitor charge switches.

A.3 Option U has been added if FS3 to provide a low-voltage disconnect feature for use with 48-volt (option W) plants only.

B. Changes in Apparatus

B.1 Added

App Fig 4

App Fig 5

S1 Switch, Marquardt 1803.1221 - FS3, App Fig 1 - P Option

S2 Switch, Oak Switch 399822-L - FS3, App Fig 1 - P Option

TB5 Terminal Block, Kulka 799-3-KT28-KT30 - FS3, App Fig 3

B.2

Removed	Replaced by
C1, C2 Capacitor KS020133, L125, 75,000 uF - FS3, App Fig 1	C1, C2 Capacitor Sprague 36DE72360600F2A, 72,000 uF - FS3, App Fig 1
F1A, F2A Fuse 70B, 1/2 Ampere - FS3 - N, W Options	F1A, F2A Fuse 70B 2 Amperes - FS3 - N, W Options
R1, R2 Resistor KS-14603, L2AD 454 Ohm - FS3, App Fig 1	R1, R2 Resistor KS-14603, L5CD 316 Ohm - FS3, App Fig 1

D. Description of Changes

D.1 On the drawing, FS7 and App Fig 5 have been added and designated option P.

LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT J85500C	DWG SIZE 2S	ISSUE 7B
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CIRCUIT DESCRIPTION
CD-82649-01
DWG ISSUE: 7B

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CHARGE AND DISCHARGE CIRCUIT
24/48V, 600 AMPERES MAXIMUM
J86500C, H569-411

D.2 On the drawing, FS8 and App Fig 4 have been added and designated options U and W.

D.3 Momentary switch S1 has been added in FS3 and App Fig 1 and has been designated option P.

D.4 Load select switch S2 has been added in FS3 and App Fig 1 and has been designated option P.

D.5 Terminal block TB5 has been added in FS3 and App Fig 1.

D.6 In FS3 and App Fig 1, the code and value of capacitors C1 and C2 have been changed from KS-20133, L12B, 75,000 uF to Sprague 36DE72360600F2A, 72,000 uF.

D.7 In FS3, the code and value of fuses F1A and F2A have been changed from 70G, 1/2 ampere to 70B, 2 amperes.

D.8 In FS3 and App Fig 1, the code and value of resistors R1 and R2 have been changed from KS-14603, L2AD, 464 ohms to KS-14603, L5CD, 316 ohms.

D.9 On the drawing, FS3 and App Fig 1 have been changed by the addition of the KS-22010 and the KS-22012 circuit breaker circuits.

D.10 Circuit Note 102 has been changed by the addition of options U, P, L and K.

D.11 Circuit Note 103 has been changed by the addition of options L and K under "AVAILABLE".

D.12 Circuit Note 115, regarding shunt lead connections, has been added on the drawing.

D.13 The Option Index table has been changed by the addition of options U, P, L and K.

1.3 CHANGES

B. Changes in Apparatus

B.1 Added

C1 and C2 Capacitors,
KS-20133, L12B, 75,000 ohms, N, W Options - App Fig 1.

F1 and F2 Fuses,
KS-19780, L5, 30A, N, W
Options - App Fig 1

F1A- and F2A- Fuses,
70B, 2A E/W 18A Fuse
Holder, N, W Options - App Fig 1

A1.2- Resistor, KS-20289, L1A,
1000 ohms, 4 W Options - App Fig 1

R1- and R2- Resistor, KS-14603, L2AD,
464, N, W Options - App Fig 1

App Fig 3, FS5 (M, W Options)

FS8 (N, W Options)

B.2

Superseded	Superseded by
LOAD Fuse Holder, 25A Fuse Block - App Fig 1	LOAD Fuse Holder, 37A Fuse Block - App Fig 1

D. Description of changes

D.1 Option Index table added.

D.2 Circuit Note 102 revised by addition of M and N options.

D.3 Circuit Note 108 expanded.

D.4 Circuit Notes 111 through 114 were added.

D.5 Equipment Notes 201 through 203 were added.

D.6 Information Notes 305 through 307 were added.

D.7 Information Note 302 changed to reference 37A Fuse Block instead of 25A.

D.8 CAD3 (M, W options) was added.

D.9 In FS3, references to Circuit Note 114, option N, ED-82947-30, G1, option W, and ED-83182-30, G5 were added.

1.4 CHANGES

B1 ADDED FS10 WITH OPTIONS AA, AB.

LINEAGE 2000 © CHARGE AND DISCHARGE CIRCUIT J86500C	DWG SIZE 2S	ISSUE 7B
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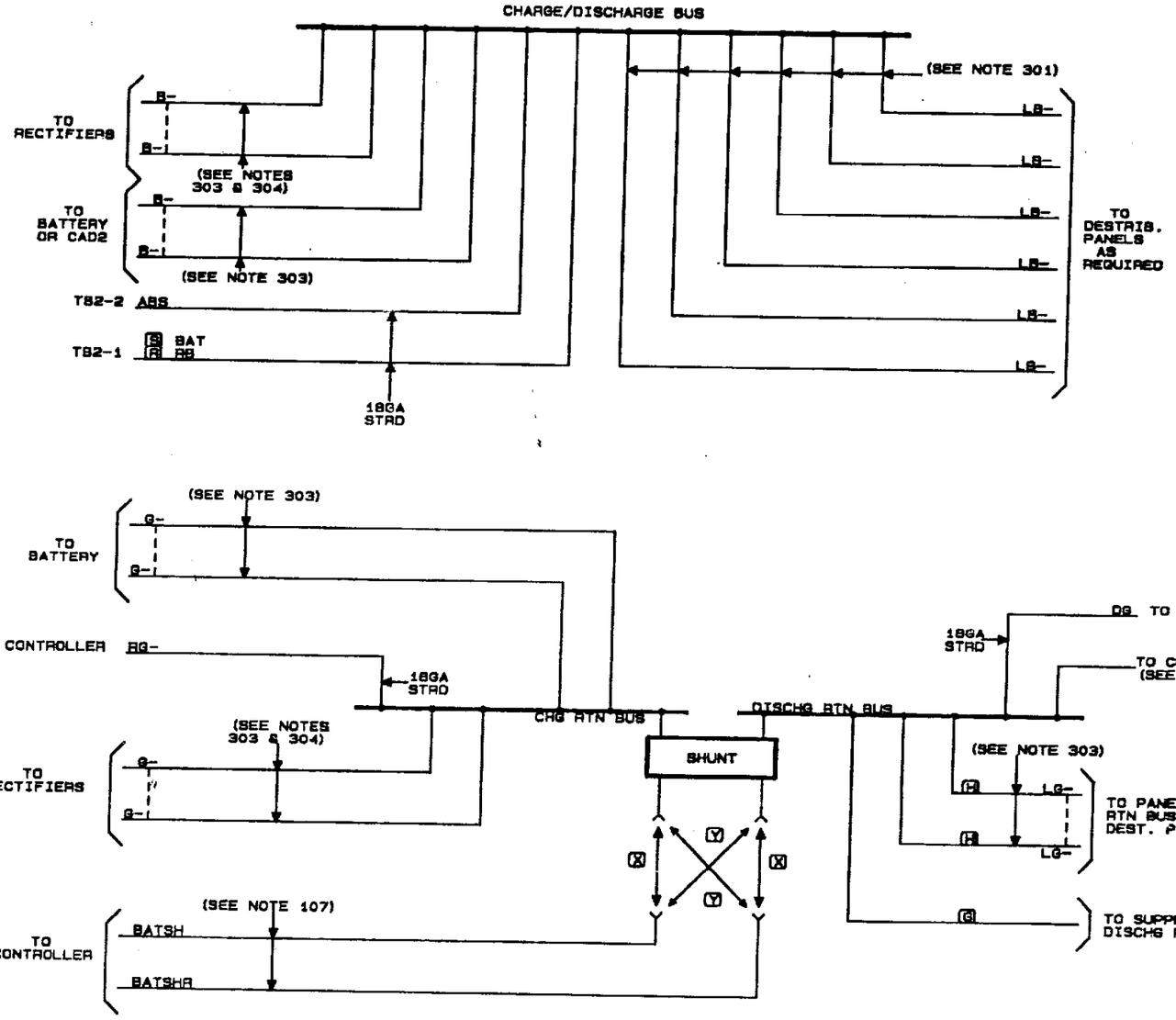
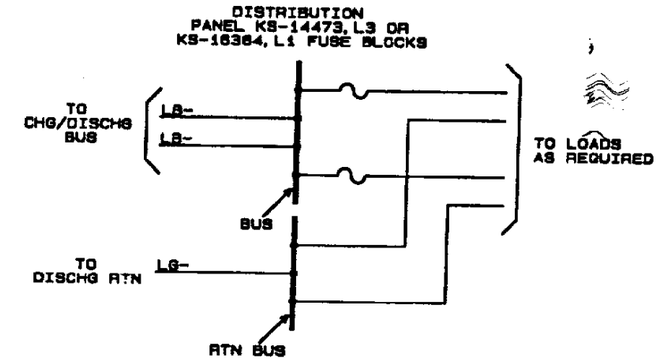
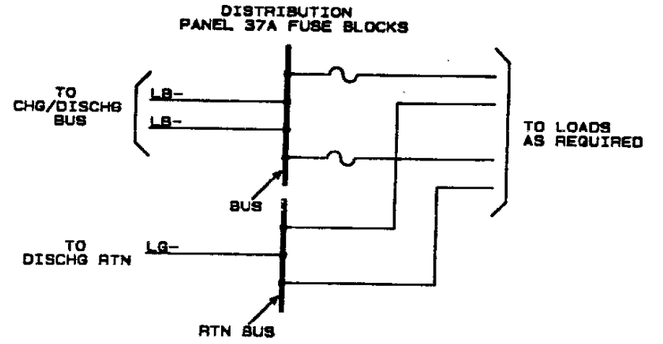
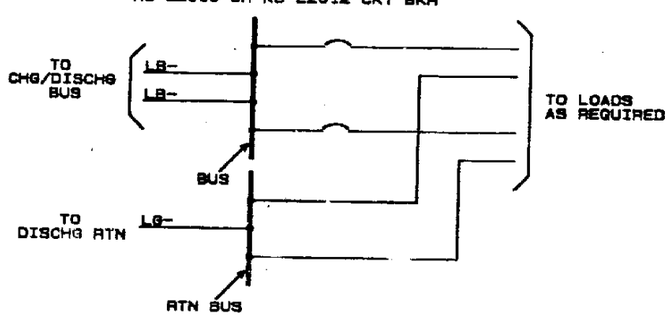
PART OF CAD 1





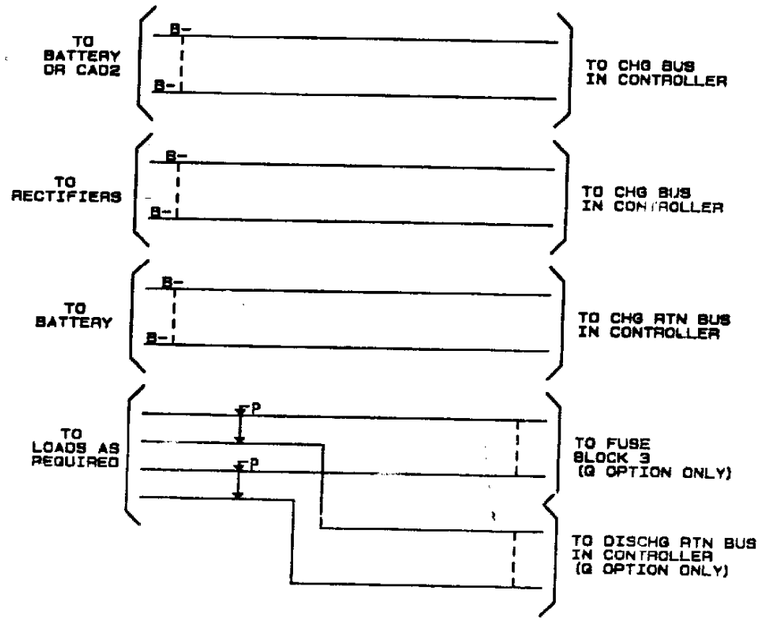


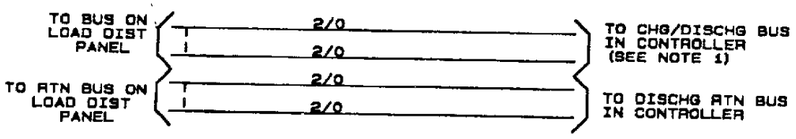


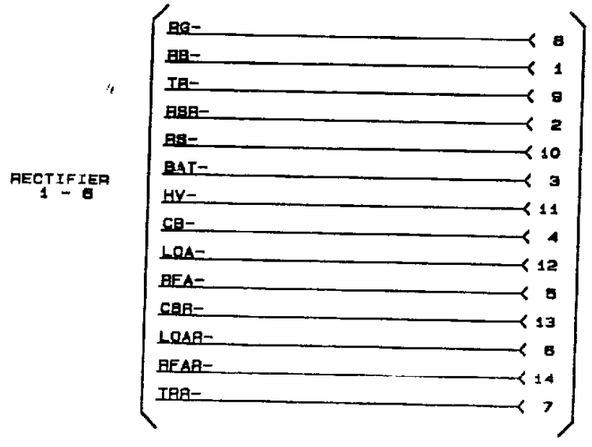
LINEAGE 2000 ® CHARGE AND DISCHARGE CIRCUIT JB3500C	DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01	SHEET 01

(G,V) PART OF CAD 1

(SEE NOTES 303 & 304)

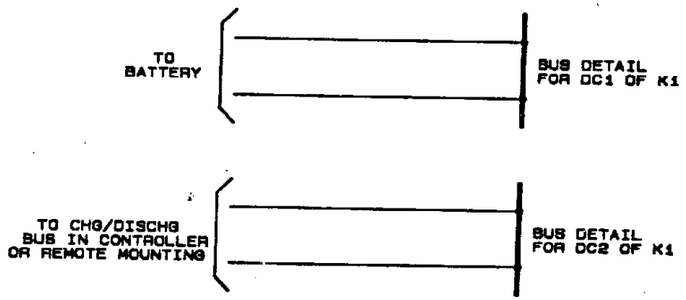




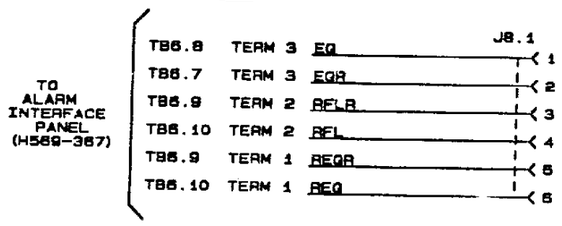


(T) CAD 2

(SEE NOTE 303)

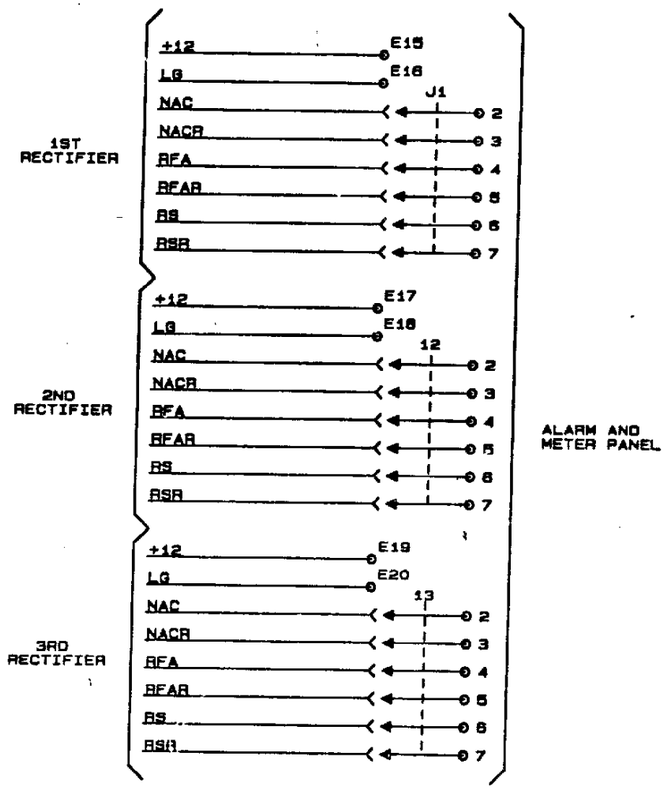


(H,W) CAD 3

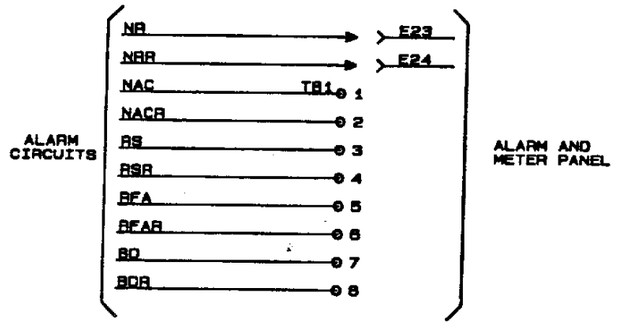


LINEAGE 2000 Ⓒ CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82648-01		SHEET 02

CAD 4



CAD 5



LINEAGE 2000 CHARGE AND DISCHARGE CIRCUIT J85500C		DWG SIZE 2S	ISSUE 7B
AT&T	SD-82649-01		SHEET 03