EMERGENCY POWERING REQUIREMENTS & RESPONSIBILITIES FOR SUBSCRIBER LINE CARRIER (SLC)

1. GENERAL

1.01 This section provides information for Indiana Bell's standard emergency power requirements at subscriber carrier (SLC) remote terminals.

1.02 This section is reissued to:

- Change information in Exhibits 1, 2, 3, 4, 5, 6, 7, 9, 10. This issue changes the Z designation of the white neutral wire to W. The W designation is used on Hubbell parts. Exhibit 1, 6, 7 are also changed to show the green ground wire and the White neutral wire with 180° separation in the Hubbell connectors.

- Change information in Exhibit 8. This issue updates the list of standby power units equipped for SLC 96 use.

1.03 This practice applies to all newly installed SLC systems using commercial power at the remote terminal and existing installations when additional systems are added to an existing site.

1.04 It shall be the practice in Indiana Bell to provide for emergency power at all commercially powered subscriber carrier remote terminal locations, except those located on customer premises, in the event of a commercial power failure.

2. ENGINEERING RESPONSIBILITIES

2.01 It shall be the responsibility of the local OPE to design SLC remote terminal locations with the electrical components required for emergency powering. The design shall be according to section 5 of the practice.

2.02 It is the responsibility of Outside Plant Engineering Staff to notify Loop Maintenance Staff of SLC 96 installations requiring 100 AMP service as they are programmed in order that necessary power generating units can be provided.

3. CONSTRUCTION RESPONSIBILITIES

3.01 It shall be the responsibility of the local Construction forces to arrange for the installation of the remote terminal electrical supply systems and to assure that it is installed according to section 5 of this practice. Construction forces shall maintain their underground work trailers that are equipped for SLC Emergency powering in working condition so they can be used when required.

4. LOOP MAINTENANCE RESPONSIBILITIES

4.01 It shall be the responsibility of the local Loop Maintenance forces to maintain their underground work trailers and or portable emergency alternators/generators in working condition for the purpose of supplying standby power to SLC remote terminal locations in the event of a commercial power failure.

4.02 It shall be the responsibility of the local Loop Maintenance group to provide standby power at SLC remote terminals, except those located on customer premises, in the event of a commercial power failure prior to the reserve battery supply being exhausted and a disruption of customer service.

4.03 In the event of power outages at multiple SLC locations it is the responsibility of the local Loop Maintenance group to arrange for standby power units from outside the local area if required. Exhibit 8 lists the initial locations of these units.

4.04 It is the responsibility of Loop Maintenance Staff to provide for a 25KW portable generating unit for remote terminals requiring 100 AMP service. This requirement is met if such a unit is located within a 60 mile radius of the intended remote terminal site.

4.05 It shall be the responsibility of the local Loop Maintenance group to verify during the initial turn-up of a remote terminal that commercial and emergency powering provisions have been provided according to Section 5 of this

practice. These verifications will include the actual operating of the remote terminal from standby equipment.

4.06 It shall be the responsibility of the local Loop Maintenance Dept. to label all standby power outlets with the electrical specifications of the unit; such as 7.5 KW; 30 AMP; 120/240 VOLTS: 1Ø.

4.07 It shall be the responsibility of the local Loop Maintenance group to label all remote terminal standby power inlets with the maximum electrical requirements for that location; such as 4.5 KW, 30 AMP; 120/240 VOLTS; 1Ø.

All labeling will be done using standard black and yellow decals. Labels will be located next to the emergency receptacles.

5. DESIGN

5.01 The following Hubbell inlet receptacles will be standard at all new remote terminal locations and when additional systems are added to an existing site. (See Exhibits 9 & 10)

1-4	36 type cabinets	430B12W
1-2	80 type cabinets	430B12W
1	Mini-Hut	430B12W
1	CEV	4100B12W
1	EEE	4100B12W
1	Maxi-Hut	4100B12W

5.02 A Hubbell outlet receptacle #430R12W will be used on all standby power units for amperage requirements up to 30 AMPs. See paragraph 5.07.

5.03 A Hubbell outlet receptacle 4100R12W will be used on all standby power units for amperage requirements of greater than 30 AMPs, but not to exceed 100 AMPs.

5.04 Extension cords to be used for 30 AMP service will be constructed of a 25' "SO" 10-4 cord equipped with a Hubbell 430P12W plug as the source end and a Hubbell 430C12W connector on the RT end.

5.05 Extension cords to be used for 100 AMP service will be constructed of a 25' "SO" 2-4 cord equipped with a Hubbell 4100P12W plug on the source end and a Hubbell 4100C12W connector on the RT end.

NOTE: Cords up to 50 ft. in length may be specified where required.

Extension cords will be maintained with the standby power unit.

CAUTION: Under no circumstances shall electrical wiring be attempted by anyone other than a licensed electrician.

5.06 All HESCO, SEPCO, or PELSUE work trailers that will be used as standby power units will be equipped with a Hesco Standby Receptacle Panel #9500-2. Exhibit #1.

5.07 Electrical connections for the Hubbell R12W outlet receptacles to alternators/generators will be according to Exhibits 2 (30 AMP) and 3 (100 AMP)

5.08 Electrical connections and wiring for the extension cord will be according to Exhibit 4 (30 AMP) and 5 (100 AMP).

NOTE: Extension cord assemblies may be ordered from HESCO manufacturing or fabricated by a local electrical contractor.

5.09 Electrical wiring and components for remote terminals will be according to the following exhibits.

Exhibit 6	1-4	36 type cabinets
Exhibit 6	1-2	80 type cabinets
Exhibit 6	1	Mini-Hut
Exhibit 7	1	CEV
Exhibit 7	1	EEE
Exhibit 7	1	Maxi-Hut

6. ENGINE ALTERNATOR/GENERATOR SET

6.01 The following is a list of portable electrical power units that will be used to supply emergency power at subscriber carrier remote terminal locations.

A. Hesco/Sepco/Pelsue Work Trailers

B Portable 10-25 KW Trailer Mounted Units

NOTE: Standby power units must be modified with a Hubbell 430 or 4100 type outlet before they can be used to supply electrical power to a remote terminal location. The only exception

to this will be at earlier installed remote terminals were the Hubbell 430 or 4100 type inlet where not used. At these locations the standard D extension cord will be required.

6.02 Hesco/Sepco/Pelsu Work Trailers

This type of trailer is common at most work garages throughout Indiana. These trailers are equipped with a 6.5 or 7.5 KW 120/240 single phase Alternator/Generator. To be suitable for use at terminal locations (except earlier RT installations) these units must be equipped with a Hesco Standby Receptacle Panel #9500-2. Installation of this panel will be performed by a Hesco Factory Representative or Indiana Bell's Motor Vehicle Dept. Exhibit 8 lists those units that have been equipped with the #9500-2 Panel along with their original location and KW size. New trailers will come equipped with the 9500-2 Panel.

6.03 Portable 10-25 KW Trailer Mounted 30 AMP

A. Several 10 or 15 KW 115/230 volt single phase units are available through-out Indiana Bell. Because the primary use of these units is standby power for CDO's, repeater huts, and microwave stations they should be considered for SLC applications only as a last resort.

B. To be suitable for use at remote terminal locations (excluding site not equipped with the standard Hubbell 430B12W inlet) the units must be equipped with a Hubbell 430R12W outlet thru a 30 AMP breaker.

C. It is the responsibility of Loop I&M Staff to negotiate with Maintenance Engineering; the modification and joint use of these units.

D. It is the responsibility of the local CA. Mtce. Dept. to identify the location where these types of units are required, and to refer that requirement to loop I&M Staff.

NOTE: See Exhibit 8 for original locations and KW size.

6.04 100 AMP Requirements.

A. The standard unit for 100 AMP service is a 25 KW 120/240 single phase alternator/4100R-12W outlet thru a 100 AMP breaker. These units will also be equipped with a Hubbell 430R12W outlet thru a 30 AMP breaker.

7. ESTIMATING SLC 96 POWER REQUIREMENT

7.01 Variations exist in plug-in circuit boards and mode of system operation to the point that confusion may exist in determining a power load in any given installation. (See Section 8) The calculated power load for a given site may vary with many factors over a period of years without major equipment additions. Changes in the type circuit boards, line powering arrangements, mode of operations, and type of service provided, all affect power loads. To eliminate any confusion, the following power load estimates can be used for calculations in Indiana Bell.

7.02 Maximum System Power Drains

One SLC-96 (36 type cabinet) (Note B)	860 watts
Two SLC-96 (frame-mounted) (Note C)	1194 watts
Four SLC-96 (80 type cabinet) (Note A)	2389 watts

(A) Four SLC-96 systems (80 Type Cabinet) load includes:

(1) Electronics (4 X 2.04A X 117 VAC) = 955 W (all lines busy)

(2) Back powering (270 VDC X .06A X 20/.85) = 381 W (maximum capability)

(3) High charge on batteries (4 X .75A X 117 VAC) = 351 W (four battery strings)

(4) Battery heaters (4 X 1.5A X 117 VAC) = 702 W (four battery strings)

Total = 2389 W

(B) A SLC-96 system (36 type cabinet) load includes:

(5) Electronics (2.04A X 117 VAC) = 239 W (all lines busy)

(6) Back powering (270 VDC X .06A X 5/.85) = 95 W (maximum capability)

(7) High charge on batteries (2 X .75A X 117 VAC) = 175 W (two battery strings)

(8) Battery heaters (2 X 1.5A X 117 VAC) = 351 W (two battery strings)

Total = 860 W

(C) Two SLC-96 systems (frame-mounted) load includes:

(9) Electronics (2 X 2.04A X 117 VAC) = 478 W (all lines busy)

(10) Back powering (270 VDC X .06A X 10/.85) = 190 W (maximum capability

(11) High charge on batteries (2 X .75A X 117 VAC) = 175 W (two battery strings)

(12) Battery heaters (2 X 1.5A X 117 VAC) = 351 W (two battery strings)

Total = 1194 W

7.02 Non-carrier load considerations include, but are not limited to, the following:

(a) Indoor lighting

(b) Outdoor security lighting

(c) Well pump motor (toilets/lawn sprinkler)

(d) Electric space heating

(e) Ventilation fans and blowers

(f) Air conditioning equipment

(g) Sump pump

Based on the manufacturers data, determine the wattage of each item and add the wattage of each item to the carrier load from Sections 7.02. When estimating the air conditioning loads, use starting loads.

NOTE: All non essential loads should be served by commercial power only and rendered idle in emergency situations by the interlock or transfer switch.

7.04 The following procedures shall be used to operate a SLC-96 from emergency power.

Step

1. Check engine for proper lubrication, coolant, and fuel levels.
2. Connect cord securely to generator and remote terminal.
3. Start engine generator set.
4. Operate transfer switch to "Generator Supply" position.

8. CALCULATING SLC-96 POWER REQUIREMENTS

The following paragraphs provide specific power requirements for a SLC-96 RT installation and explain the equipment to be included when calculating power requirements.

8.01 Channel Banks

The bank can be operated in any of three modes by the choice of appropriate common plug-in units:

Mode I - (unconcentrated) up to 96 full-time POTS channels

Mode II - (2:1 time division concentration) up to 96 POTS lines on 48 channels

Mode III - (Special services mode) up to 48 full-time special services channels.

Because the 1:1 concentrationin a Mode II bank limits its power drain, only Modes I and III are considered here. Drains for Mode I are determined for POTS only.

The per circuit power drains for a single-party channel are 0.31 watts (idle) and 1.89 watts (active). This assumes a conservative 300 ohms for conductor loop resistance, and 200 ohms for the station set. Multi-party drains are about equal to single-party drains. The single-party drains, therefore, are used here in all POTS calculations.

D4 two-wire FXS channel units are used to determine power drains for Mode III. The idle and active power drains per circuit are 0.34 and 3.69 watts, respectively. Although the FXS units have lower idle power drains than the new D4 OCU data ports, for average and worst case traffic conditions, the FXS units dominate power drains.

Channel units have two power drain components: a non-traffic dependent (idle) component and a traffic (active) dependent component. The channel unit component of total bank drain are:

Mode I (POTS Only)

29.8 + 1.58n (watts)

Mode III (SS Only)

16.3 + 3.35n (watts)

where n = the number of lines off-hook.

Common Plug-In power drains are:

Mode I (POTS Only)

a. 37.7 Watts w/o back powering
b. 90.5 Watts with back powering

Mode III (SS Only)

a. 36.5 Watts w/o back powering
b. 68.2 Watts with back powering

Total bank power drains are:

Mode I (POTS Only)

a. 67.5 + 1.58n w/o back powering
b. 120 + 1.58n with back powering

Mode III (SS Only)

a. 52.8 + 3.35n w/o back powering
b. 84.5 + 4.55n with back powering

Table A summarizes the SLC-96 bank components.

8.02 Remote Terminal Bays

The RT bay is 7' high and accommodates two SLC-96 channel banks plus associated support equipment. Support equipment includes:

1A Ringing Generator (up to two per bay)

3A Battery charger

128A Apparatus Mounting and KS21906,L4 Batteries (Up to two battery strings per bay)

8.02.1 1A Ringing Generator

The ringing generator idles at 300mA at -48Vdc (14.4 watts). Ringing is applied to the line at 100Vrms, 20Hz. Assuming three bridged ringers per line (9k ohms each) and 1k ohm channel unit impedance yields 2.5 watts per rung line. With two ringing generators per bay and 55 percent efficiency the total - 048Vdc power drain is:

28.8 + 4.55m (watts),

where m = the number of lines rung simultaneously.

8.02.2 3A Battery Charger

The batter charger serves two functions. Under normal conditions (ac power available), it rectifies the 117Vac to provide the -48Vdc required to power the two SLC-96 banks in the bay. It also provides two rates of charging for the lead-acid backup batteries. Upon restoration of ac power, a high-rate constant current charge is used to return the batteries to full charge within 24 hours. A low-rate charge keeps the batteries at full capacity under normal operating conditions.

The rectifier is 85 percent efficient and high-rate charging draws 88 watts per battery string at 117Vac.

8.02.3 Backup Batteries

The 128A apparatus mounting houses four connectorized 12Vdc battery packs that supply 25AH reserve power (one string). Normally, two battery strings per bay are provided (i.e., one string per SLC-95 bank).

The mounting also contains a thermostatically controlled heater that ensures adequate battery operation at low ambient temperatures. The heater is activated at 30°F. Each heater (one per string) is powered from 117Vac and draw 1.25A (146 watts).

Table A summarizes the SLC-96 RT bay -048Vdc and 117Vac power drains.

8.03 Remote Terminal Enclosures

This section presents the 117Vac power requirements for large RT enclosures that can be used to size emergency portable alternators.

For the portable alternator case, the normal full complement of battery strings (i.e., two per bay) is assumed to meet the 8-hour minimum reserve requirement.

8.03.1 Mini-Hut

The Mini-Hut RT enclosure houses up to five SLC-96 RT bays (i.e., 10 channel banks). The maximum line serving capacity is:

960 lines (Mode I - POTS Only)

480 lines (Mode III - SS Only)

In addition to the bays, hut lighting and ventilation offer the following 117Vac power drains:

Lighting	=	80 Watts
Ventilation	=	42 Watts

Exhibit #11 summarizes the total power drains for a fully equipped Mini-Hut.

8.03.2 Controlled Environment Vault (CEV)

The CEV houses up to ten SLC-96 RT bays (i.e., 20 channel banks). The maximum line serving capacity is:

1920 lines (Mode I - POTS Only)

960 lines (Mode III - SS Only)

In addition to the bays, the following CEV support equipment present additional 117Vac power drains:

Lighting	=	160 Watts
Emergency Lighting	=	160 Watts
Ventilation Fan	=	560 Watts
Gas Analyzer	=	100 Watts
Sump	=	550 Watts
Air Conditioner*	=	2,800 Watts
CEV Heater	=	1,000 Watts
Dehumidifier	=	1,170 Watts

All of these items do not run concurrently and a straightforward sum of their power drains should **not** be used. For example, the ventilation fan and dehumidifier are logically (hardwired) prevented from running simultaneously. The following set of equipment is included in power drain calculations:

Lighting	=	160 Watts
Emergency Lighting	=	160 Watts
Gas Analyzer	=	100 Watts
Sump	=	550 Watts
Air Conditioner*	=	2,800 Watts
Dehumidifier	=	1,170 Watts
TOTAL		4,940 Watts

*Includes condenser fan and evaporator.

Exclude: Battery Heaters = 2,920 Watts
CEV Heater = 1,000 Watts
Ventilation Fan = 560 Watts

Rationale: The battery heaters are excluded because the temperature in the CEV will not drop to 30°F even with an outside temperature of -40°F. Although the ventilation fans run for at least one minute every fifteen minutes, the fan and dehumidifier are prevented from running simultaneously. The CEV heater will not be activated under the conditions required for air conditioner operation.**

Exhibit #12 summarizes the total power drains for a fully equipped CEV.

8.03.3 Environmental Equipment Enclosure (EEE)

The EEE houses up to twenty SLC-96 RT bays (i.e., 40 channel banks). The maximum line serving capacity is:

3,840 lines (Mode I - POTS Only)

1,920 lines (Mode III - SS Only)

In addition to the bays, the following EEE support equipment present additional 117Vac power drains:

Ventilation Fan	=	287 Watts
Vent Louver Motor	=	130 Watts
Lighting	=	240 Watts
Air Conditioner**	=	2,800 Watts
ECP**	=	100 Watts

**The CEV heater is thermostatically set to come on at 65°F.

***A second (optional) air conditioner is prevented from operation under commercial ac outage, even if a portable generator is employed.

The following equipment is included in power drain calculations:

Lighting	=	240 Watts
ECP	=	100 Watts
Battery Heaters	=	5,800 Watts
TOTAL		6,180 Watts
Exclude: Air Conditioner	=	2,800 Watts
Ventilation Fan	=	287 Watts
Vent Louver Motor	=	130 Watts

Rationale: The battery heaters and air conditioner will not run simultaneously, and the battery heaters offer the higher power drain. The ventilation fan and louver are thermostatically controlled and will not be operated under the conditions required for battery heater activation.

Exhibit #13 summarizes the power for the EEE.

8.04 Traffic Consideration

The total RT enclosure power drain is a function of the number of lines off-hook. In this section total 117Vac power requirements are summarized for three traffic conditions.

Idle = all lines on-hook

AWC (average worst case) = assumes 6.5 ccs/line for POTS and 18 ccs/line for specials

EWC (extreme worst case) = all lines off-hook

The number of lines simultaneously off-hook for AWC are:

No. Lines Off-Hook

	Mode I (POTS Only)	Mode III (SS Only)
Mini-Hut	200	240
CEV	400	480
EEE	800	960

Ringing generator loads are also traffic dependent. It is assumed that 3 percent of POTS and 6 percent of special services lines are rung simultaneously.

The following tables summarize the total 117Vac power requirements for the three RT enclosures.

Table B - SLC-96 117Vac Power Requirements without Back Powering (Two Battery Strings/Bay)

Table C - SLC-96 117Vac Power Requirements with Back Powering (Two Battery Strings/Bay)

8.05 SLC-96 System Lightwave Feature

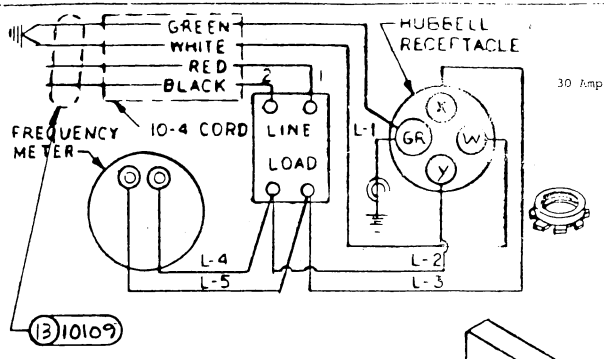
The SLC-96 lightwave feature will be available in two configurations: a DS2 rate and a DS3 rate. Both configurations utilize the same RT bay powering arrangement and equipment as basic (T1) SLC-96 (i.e., 3A Battery Charger and KS21906,L4 batteries).

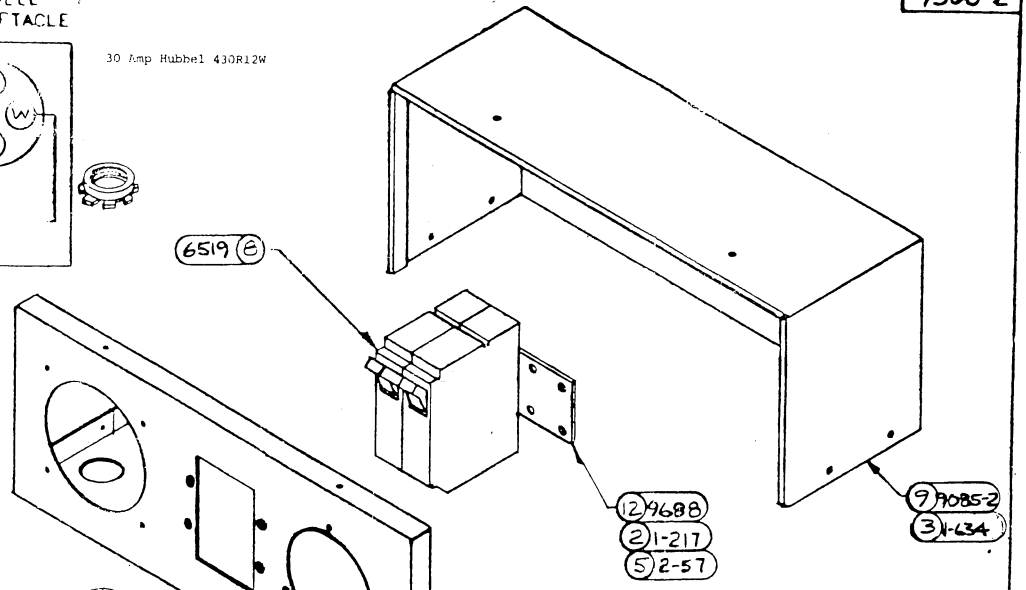
The DS2 rate configuration multiplexing and lightguide interfacing equipment is completely contained within the SLC-96 channel bank. The power drain of a DS2 fiber bank is roughly equal to that of a T1 bank without back powering. The total 117Vac power drains for Mini-Hut, CEV, and EEE enclosures equipped with DS2 lightwave systems, therefore, are bounded by the drains given in Table B for T1 SLC-96 systems.

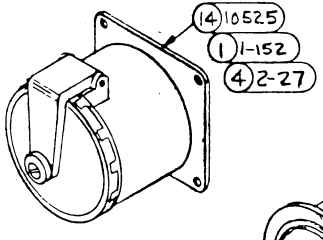
The DS3 configuration employs a pair of low speed (DS2) electrical muldems (main and protection) in the SLC-96 channel bank (replacing the T1 LIUs) and a separate shelf of equipment that performs DS2/DS3 multiplexing demultiplexing and optical line interfacing to the fibers.

Table D summarizes the total 117Vac power requirements for the three enclosures equipped with DS3 lightwave systems. The following assumptions were made in generating these power drains:

9500-2







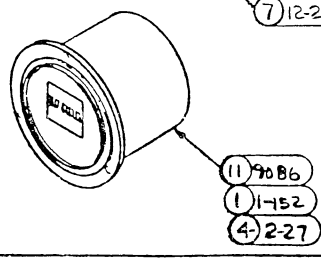


EXHIBIT #1

HESCO PART NUMBERS

Item No.	Quantity	Part No.	Description
1	7	1-152	#6-32 X 1/2" SCREW
2	4	1-217	#8-32 X 3" SCREW
3	6	1-634	#8 X 1/2" SHEET METAL SCREW
4	7	2-27	#6-32 KEPS NUT
5	4	2-57	#8-32 KEPS NUT
6	12	2-177	1/4-28 NUT SERT
7	1	12-29	3/4" ROMEX CONNECTOR
8	1	6519	CIRCUIT BREAKER, 30AMP
9	1	9085-2	COVER
10	1	9085-4	FACE PLATE
11	1	9036	FREQUENCY METER
12	1	9088	PLATE
13	1	10109	LEAD ASSEMBLY
NS	1	10110	DECAL
NS	1	10111	WIRE KIT
14	1	10525	RECEPTACLE

THIRTY AMPERE ENGINE ALTERNATOR RECEPTACLE

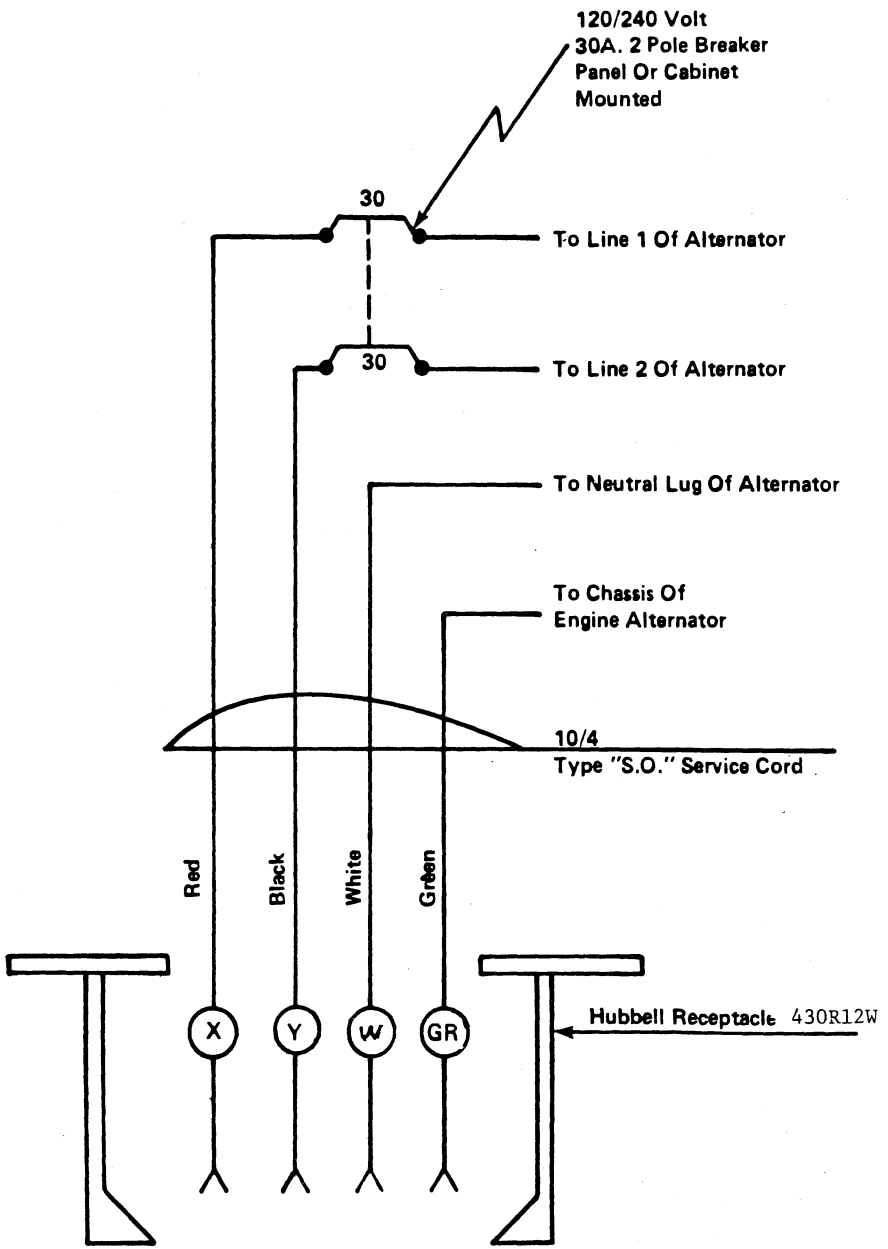
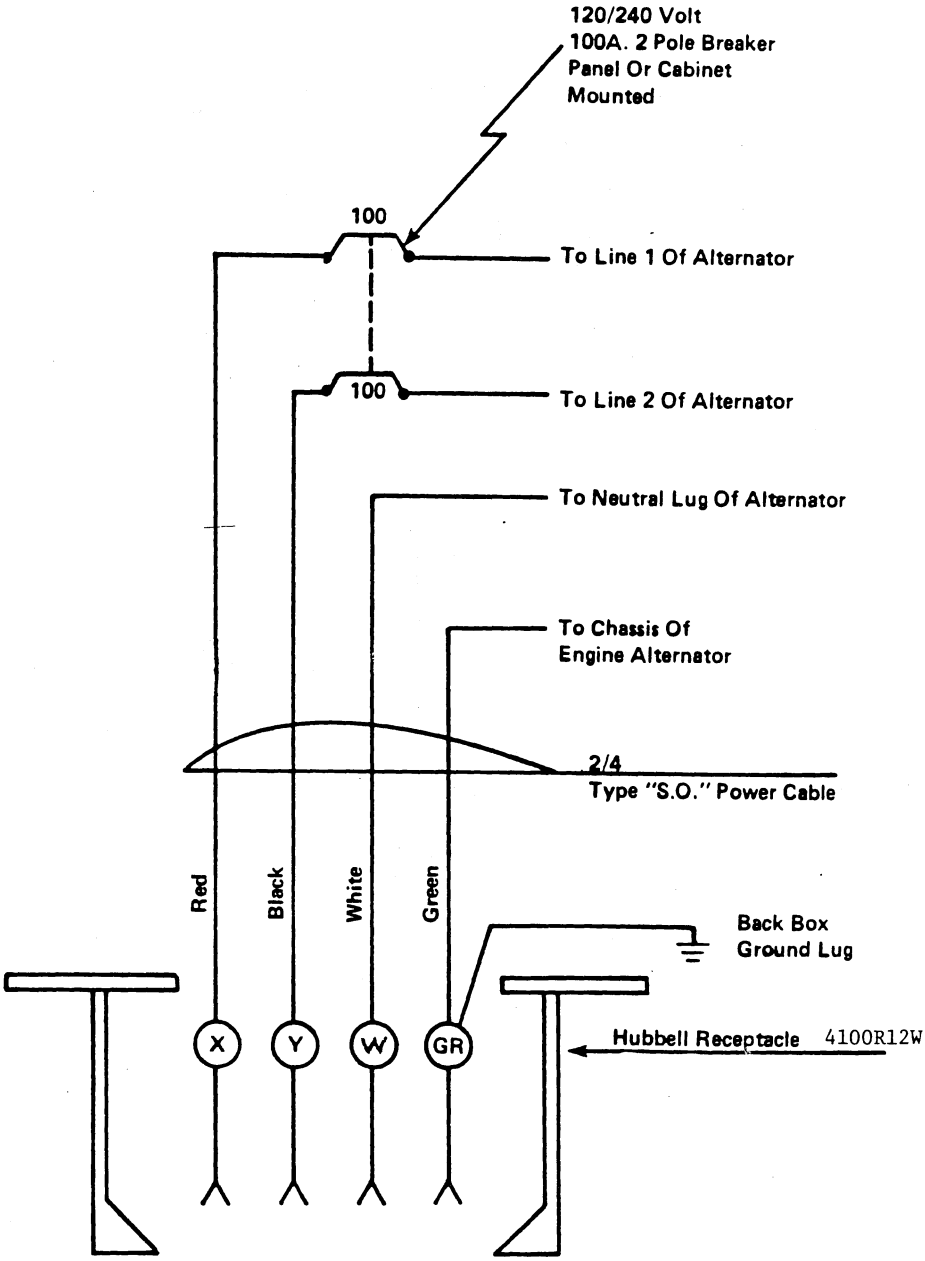
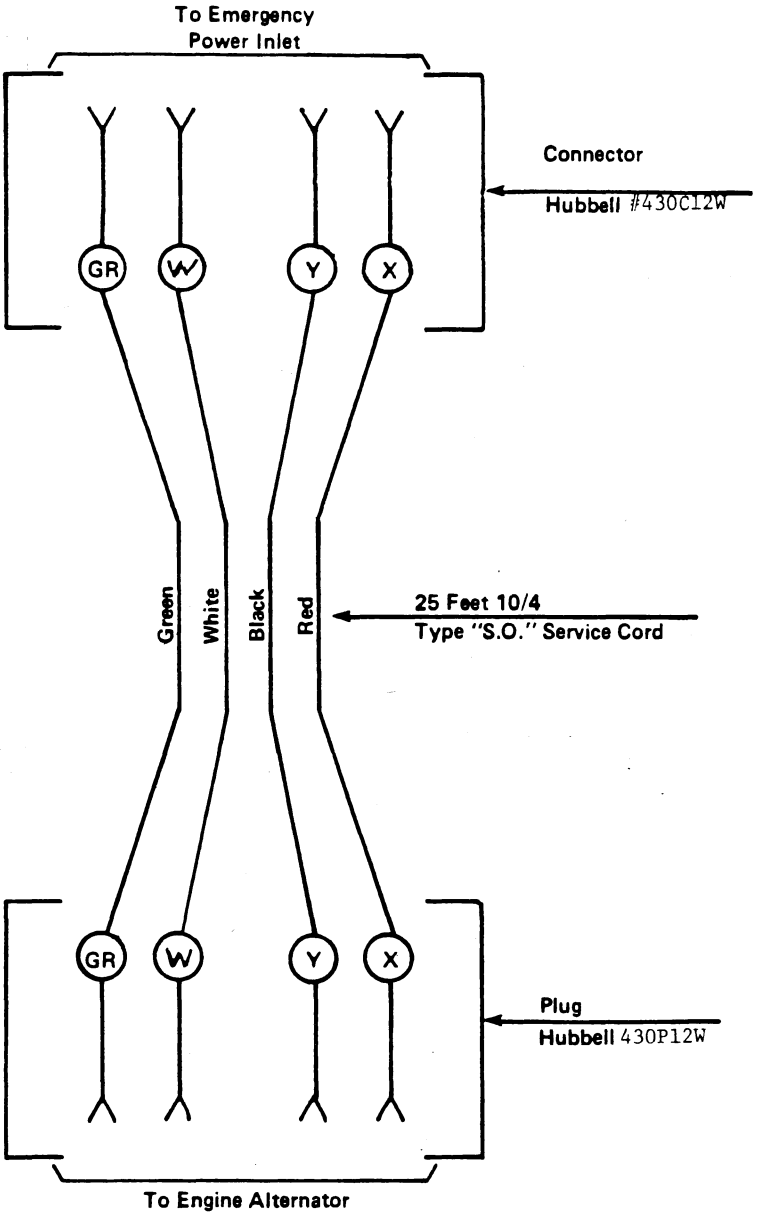


EXHIBIT #2



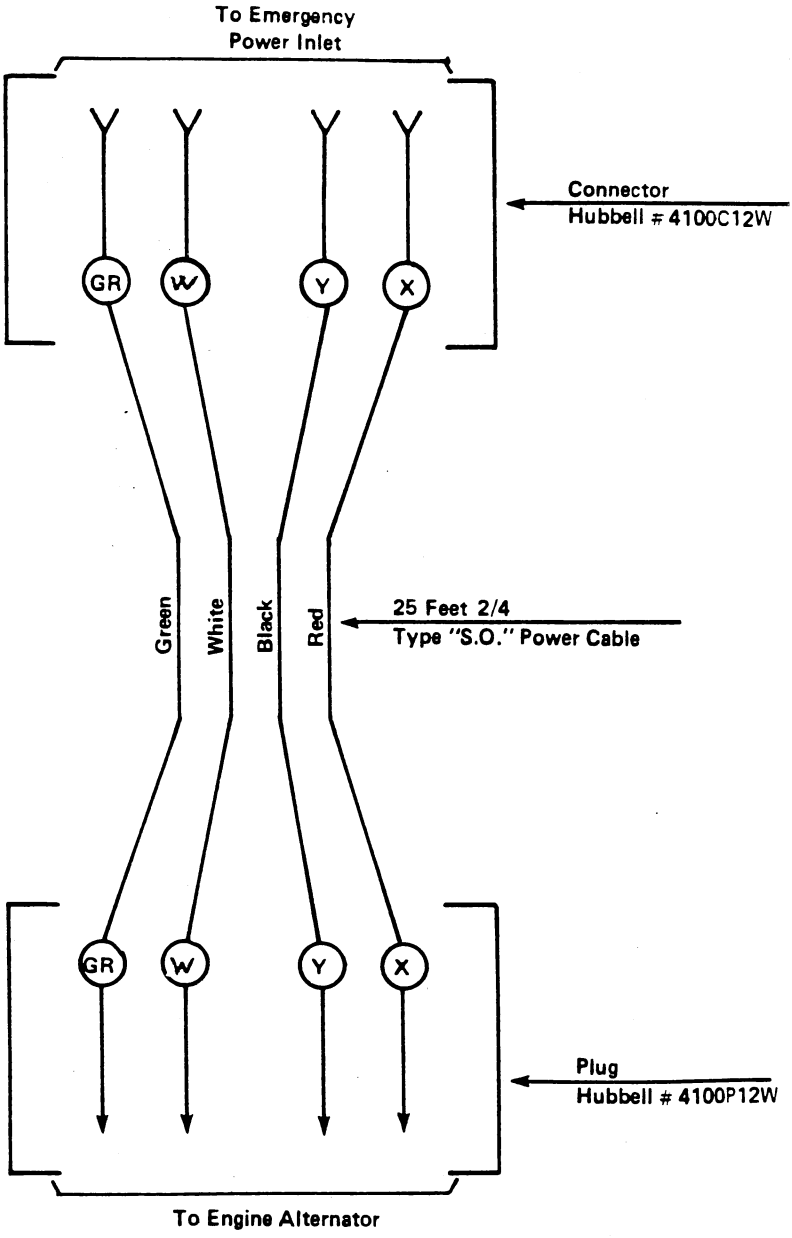
ONE HUNDRED AMPERE ENGINE ALTERNATOR RECEPTACLE

EXHIBIT #3



30 AMPERE CORD SET

EXHIBIT #4



100 AMPERE CORD SET

EXHIBIT #5

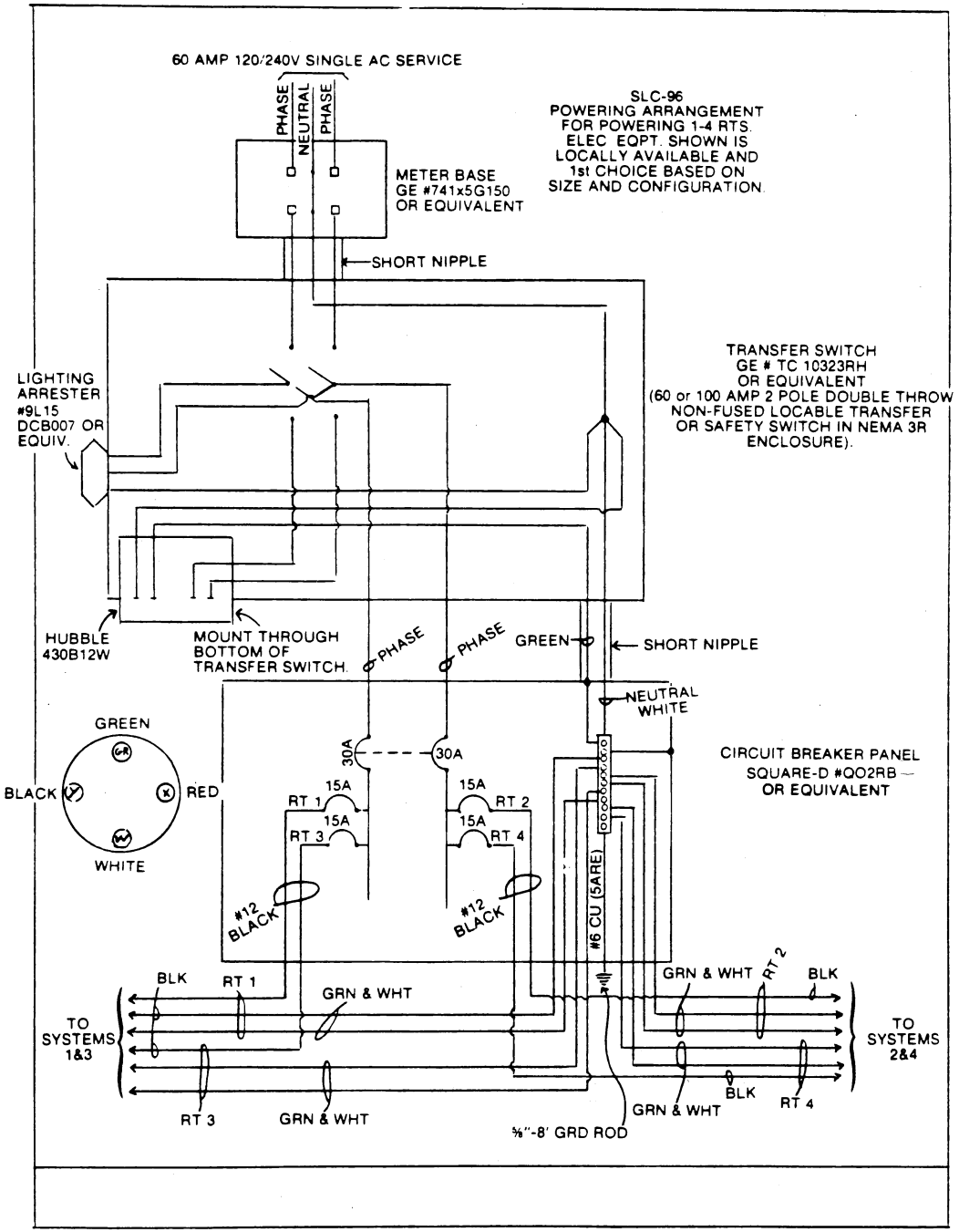


EXHIBIT #6 REMOTE TERMINAL WIRING DIAGRAM
FOR EMERGENCY POWERING 30 AMP
HUBBELL 430B12W CONNECTOR

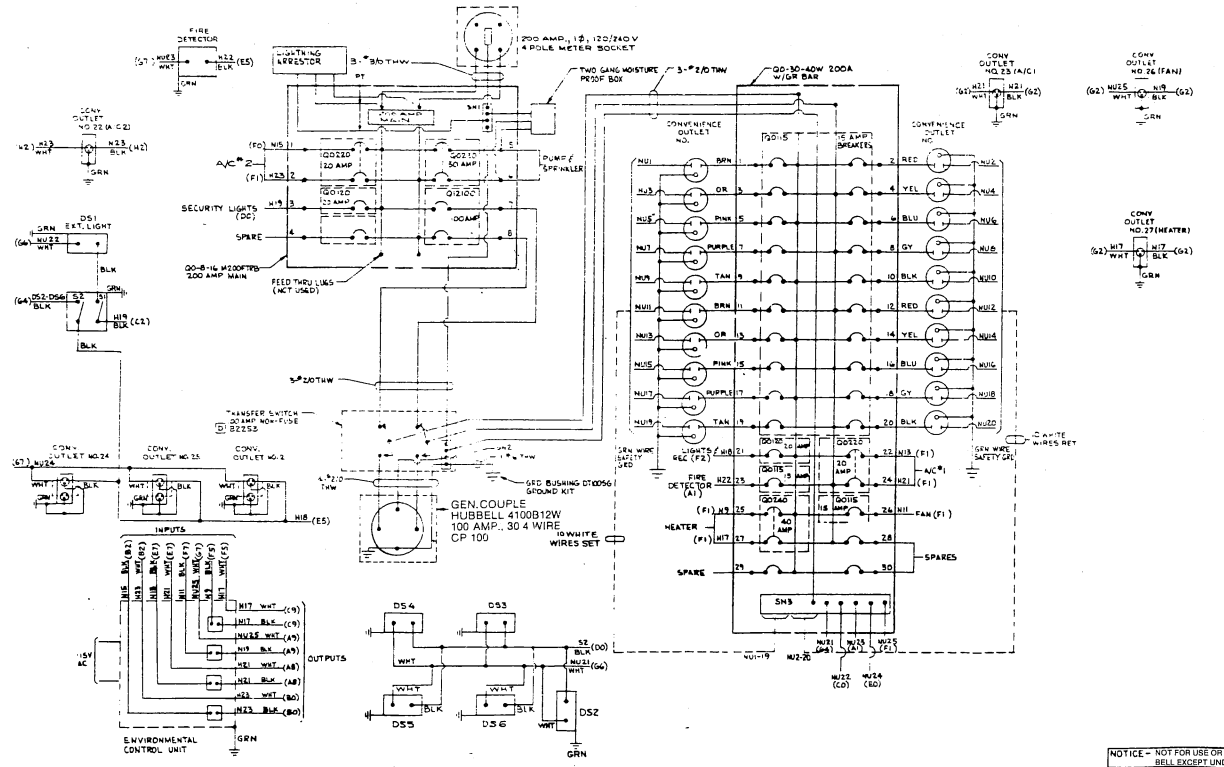


EXHIBIT #7 REMOTE TERMINAL WIRING DIAGRAM FOR EMERGENCY POWERING 100 AMP HUBBELL 4100B12W CONNECTOR

ELECTRONIC EQUIPMENT ENCLOSURE (EEE)
GENERAL INSTALLATION & SITE GUIDELINES
SLC-96 ELECTRICAL SCHEMATIC

DWG SIZE: 183 | ISSUE:

BELL LABORATORIES | L-527726 SH 2 of 10

INDIANA BELL
UNITS EQUIPPED WITH 9500-2 STANDBY POWER RECEPTACLE
30 AMP

SERIAL #	SIZE OF GENERATOR	NAME & LOCATION
040-67723A	7.5 KW	Bill Mayer 1450 Washington St. Frankfort, In. 317-654-8766
040-68617A	7.5 KW	Archie Nine 102 W. Sycamore Attica, In. 317-762-3500
040-67617A	7.5 KW	Bill Baker RR #4 US 41 Rockville, In. 317-569-6853
015-67602R 015-67907A 040-70041A	6.5 KW 7.5 KW 7.5 KW	Rick Harbottle New Richmond Rd. Crawfordsville 317-362-4490
000092588	7.5 KW	Bill Rund 601 E. Alto Rd. Kokomo, In. 317-453-0654
015-69517A	7.5 KW	Joe Wahman 104 E. Tate St. Kokomo, In.
015-69516A	7.5 KW	Joe Wahman 6020 S. Meridian Marion, In. 317-453-2147
015-69515A	7.5 KW	Don Shaner 6020 S. Meridian Marion, In. 317-674-1869
000092586	7.5 KW	Jim Kendrick E. Riggin Rd. Muncie, In. 317-286-2309

SERIAL #	SIZE OF GENERATOR	NAME & LOCATIONS
015-69512A 015-67545R	7.5 KW 6.5 KW	Gene Noll E. Riggin Rd. Muncie, In. 317-286-2414
04067688A	7.5 KW	Jim Kendrick 2301 Troy Ave. New Castle, In. 317-286-2309
015-69443A 040-67814A 015-67682R	7.5 KW 7.5 KW 6.5 KW	Gene Noll 2712 Eckhouse Anderson, In. 317-286-2414
040-70347A	7.5 KW	Larry Gullett 2712 Eckhouse Anderson, In. 317-642-5791
000090819	7.5 KW	Tom Marquand 222 E. 12th St. Auburn, In. 219-925-2718
015-68977A	7.5 KW	Joe Wahman 815 N. Condit Huntington, In. 317-453-2147
015-69444A	7.5 KW	Dan Carper 1401 Prairie Av. South Bend, In. 219-237-8204
000088547 015-69523A	7.5 KW 7.5 KW	Jack Katona 1020 E. 5th St. Mishawaka, In. 219-237-8810
040-70045A 015-69521A 015-69383A	7.5 KW 7.5 KW 7.5 KW	Jim Dillman 1404 Prairie Av. South Bend, In. 219-237-8435
015-69384A 015-69522A 015-67735R	7.5 KW 7.5 KW 7.5 KW	Jim Dillman 1313 E. Jefferson Mishawaka, In. 219-237-8435

SERIAL #	SIZE OF GENERATOR	NAME & LOCATIONS
015-69375A	7.5 KW	Jim Dillman 1808 Kentucky St. Michigan City, In. 219-237-8435
040-70036A	7.5 KW	Lee Gage 101 Mariner Dr. Michigan City, In. 219-872-9135
040-70326A	7.5 KW	John King 3775 Garfield St. Gary, In. 219-924-1417
015-68818A	7.5 KW	Ken Shaffer 600 W. Indiana Crown Point, In. 219-663-9951
040-70046A 040-70038A 015-69526A 015-69382A 015-68817A	7.5 KW 7.5 KW 7.5 KW 7.5 KW 7.5 KW	Kent Berridge 9400 Indpls. Blvd. Highland, In. 219-633-2842
040-70327A	7.5 KW	Marlene Bursky 3102 169th Place Hammond, In. 219-845-9968
040-70331A 040-67702A 015-67883A	7.5 KW 7.5 KW 7.5 KW	Jack Vanderbur RR #4 Louisville Rd. Columbus, In. 812-948-7030
015-68432A	7.5 KW	Larry Carteaux RR #4 Louisville Rd. Columbus, In. 812-372-8221
000092587	7.5 KW	Denny Fields 1105 St. Joe Shelbyville, In. 317-398-9718
015-69398A	7.5 KW	Neil Gatliff 130 E. Bell Ave. Jeffersonville, In. 812-288-9237

SERIAL #	SIZE OF GENERATOR	NAME & LOCATIONS
040-70043A 015-69514A	7.5 KW 7.5 KW	Jack Vanderbur 606 Mt. Tabor Rd. New Albany, In. 812-288-9237
015-69671A 040-70330A 015-67600R 015-67601R 015-67686R 015-69073R	7.5 KW 7.5 KW	Gerald Travers 5525 Old Boonville Hwy. Evansville, In. 812-477-9898
000072688 015-68434	7.5 KW	Larry Vadbunker 5525 Old Boonville Hwy. Evansville, In. 812-477-6849
015-68433A	7.5 KW	Henry Helfrich 411 E. Market Evansville, In. 812-464-6244
015-68618A	7.5 KW	Joseph Purlee 1912 8th St. Bedford, In. 812-279-6572
040-70042A 015-69513A	7.5 KW 7.5 KW	Bill Haynes 1425 N. Willis Bloomington, In. 812-334-4936
015-68430A	7.5 KW	John Howe 1425 N. Willis Bloomington, In. 812-334-4539
000085888	10 KW	Bob Arnold 56 N. Montgomery Spencer, In. 812-334-4538
040-70328A	7.5 KW	Bill Haynes 1010 S. Cherry St. Martinsville, In. 812-334-4539
015-68431A	7.5 KW 7.5 KW	Rowland Steffey 1225 Prairie Vincennes, In. 812-882-8890

SERIAL #	SIZE OF GENERATOR	NAME & LOCATIONS
015-69374A 015-69442A	7.5 KW 7.5 KW	Doc Miller 601 S. Girls School Rd. Indianapolis, In. 317-241-2597
015-69372A	7.5 KW	John Klarick 5250 Moller Rd. Indianapolis, In. 317-291-6341
040-70333A	7.5 KW	R. A. Finney 5636 Progress Dr. Indianapolis, In. 317-247-4471
040-67701A	7.5 KW	R. A. Finney 650 E. Hanna Av. Indianapolis, In. 317-247-4471
040-70332A 040-70039A 040-67722A	7.5 KW 7.5 KW 7.5 KW	R. A. Finney 1277 W. 18th St. Indianapolis, In. 317-247-4471
015-69520A 040-70329A * 25-01	7.5 KW 7.5 KW 10 KW	Charles Barrett 630 S. Post Rd. Indianapolis, In. 317-846-9733
040-70335A	7.5 KW	Jack Lee 630 S. Post Rd. Indianapolis, In. 317-898-4830
015-69510A 015-69373A	7.5 KW 7.5 KW	Charles Barrett 3818 E. 96th St. Indianapolis, In. 317-846-9733
040-67623A	7.5 KW	Warner Hobbs 210 3rd Av. S. Carmel, In. 317-846-2572

* Equipped For Oaklandon CEV Only

SERIAL #	SIZE OF GENERATOR	NAME & LOCATIONS
015-69072A 015-69948A	7.5 KW 7.5 KW	Bob Morris 1124 E. Troy Av. Indianapolis, In. 317-265-2260
000090482	7.5 KW	Bob Rund Various 317-265-8644

INDIANA BELL UNITS EQUIPPED FOR 100AMP SERVICE

SIZE OF GENERATOR	NAME & LOCATION
22.5 KW	Doc Miller 601 S. Girls School Rd. Indianapolis, In.

30 AMPERE INLET

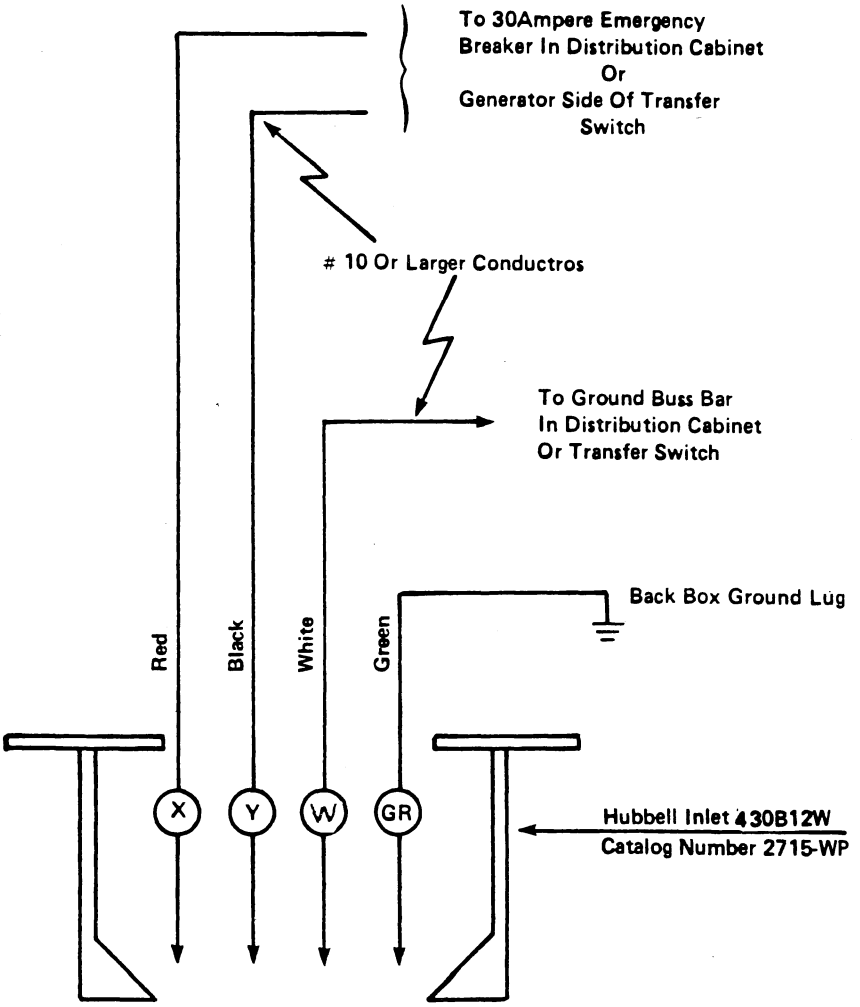


Exhibit 9

ONE HUNDRED AMPERE INLET

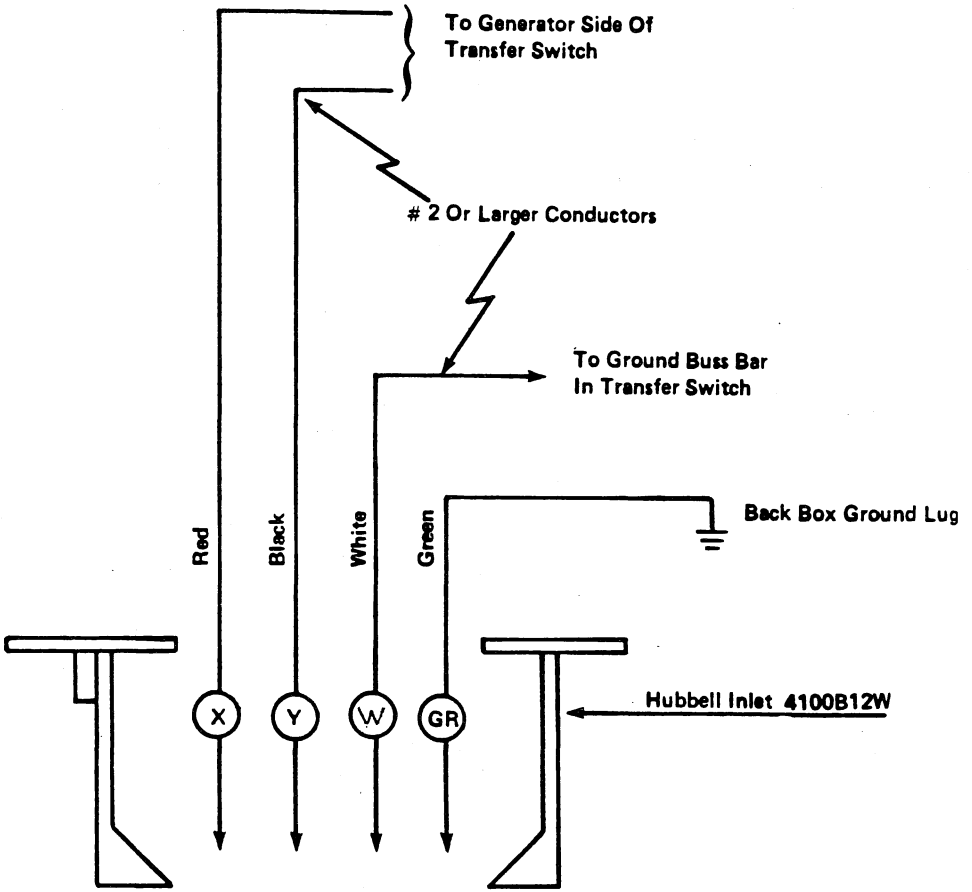


Table A: SLC-96 RT Bay Power Drain Summary

85% eff.

Bay component	-48Vdc Power Drain (Watts)	117 Vac Power Drain (Watts)
Mode I Bank POTS Only (w/o Back Powering)	67.5+1.58n	79.5+1.86n
Mode I Bank POTS Only (w/ Back Powering)	120+1.58n	141.5+1.86n
Mode III Bank SS Only (w/o Back Powering)	52.8+3.35n	62+3.9n
Mode III Bank SS Only (w/Back Powering)	84.5+4.55n	99.4+3.9n
Ringing Generators (2)	28.8+4.55m	33.9+5.4m
High-Rate Charge	--	88N
Battery Heater	--	146N

n = number lines off-hook simultaneously

m = number lines rung simultaneously

N = number of battery strings per bay (maximum of two)

Note: There is a maximum of two SLC-96 banks per bay.

EXHIBIT 10

Table B: SLC-96 117 Vac Power Requirements without Back Powering [Two Battery Strings/Bay]

		Idle	AWC	EWC
Mini-Hut	Mode I (POTS only)	3,580 W	3,951 W	5,364 W
	Mode III (SS only)	3,407 W	4,353 W	5,298 W
CEV	Mode I (POTS only)	8,935 W	9,679 W	12,504 W
	Mode III (SS only)	8,589 W	10,481 W	12,373 W
EEE	Mode I (POTS only)	14,170 W	15,658 W	21,308 W
	Mode III (SS only)	13,478 W	17,262 W	21,046 W

EXHIBIT 10

Table C: SLC-96 117 Vac Power Requirements with Back Powering [Two Battery Strings/Bay]

		Idle	AWC	EWC
Mini-Hut	Mode I (POTS only)	4,200 W	4,573 W	5,985 W
	Mode III (SS only)	3,780 W	4,725 W	5,671 W
CEV	Mode I (POTS only)	10,178 W	10,921 W	13,747 W
	Mode III (SS only)	9,335 W	11,227 W	13,119 W
EEE	Mode I (POTS only)	16,655 W	18,142 W	23,793 W
	Mode III (SS only)	14,971 W	18,754 W	22,538 W

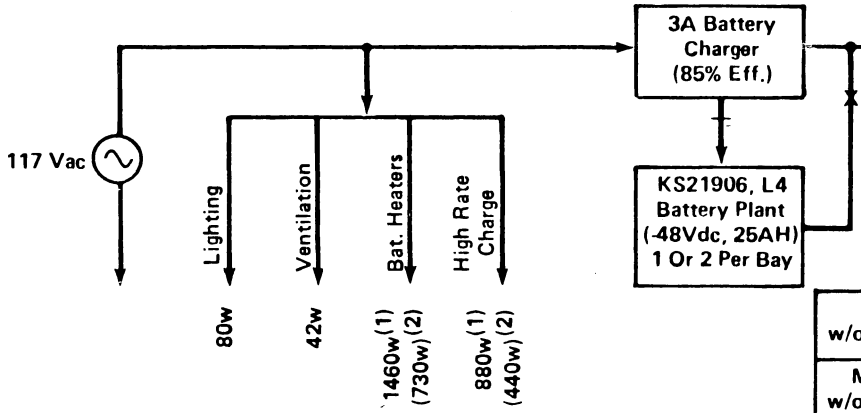
EXHIBIT 10

Table D: SLC-96 System Lightwave Feature 117 Vac Power Requirements
[Two Battery Strings/Bay]

		Idle	AWC	EWC
Mini-Hut	Mode I (POTS only)	3,625 W	3,960 W	5,231 W
	Mode III (SS only)	3,353 W	4,204 W	5,055 W
CEV	Mode I (POTS only)	9,056 W	9,688 W	12,089 W
	Mode III (SS only)	8,717 W	10,420 W	12,122 W
EEE	Mode I (POTS only)	14,367 W	15,665 W	20,612 W
	Mode III (SS only)	13,635 W	17,135 W	20,637 W

EXHIBIT 10

MINI-HUT

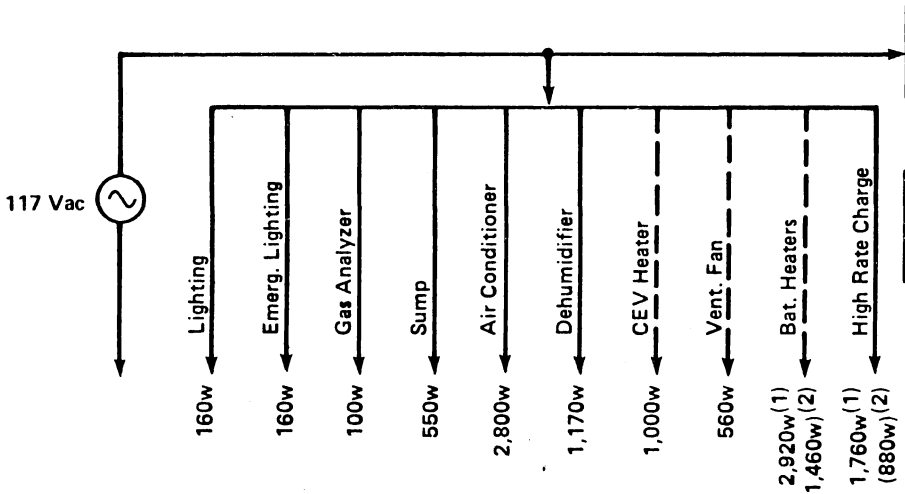


Mode I w/o Backfeed	377w	275w	298w	1.58n
Mode III w/o Backfeed	365w	275w	163w	3.35n
Mode I w/Backfeed	905w	275w	298w	1.58n
Mode III w/Backfeed	682w	275w	163w	3.35n

Notes:
(1) Two Bat. Strings/Bay
(2) One Bat. String/Bay
(3) Assumes 3% Lines Rung Simultaneously For POTS & 6% For SS
(4) n = # Lines Off-Hook

POWER DRAINS FOR FULLY EQUIPPED MINI-HUT

CEV



Mode I w/o Backfeed	754w	550w	596w	1.58n
Mode III w/o Backfeed	730w	550w	326w	3.35n
Mode I w/Backfeed	1,810w	550w	596w	1.58n
Mode III w/Backfeed	1,364w	550w	326w	3.35n

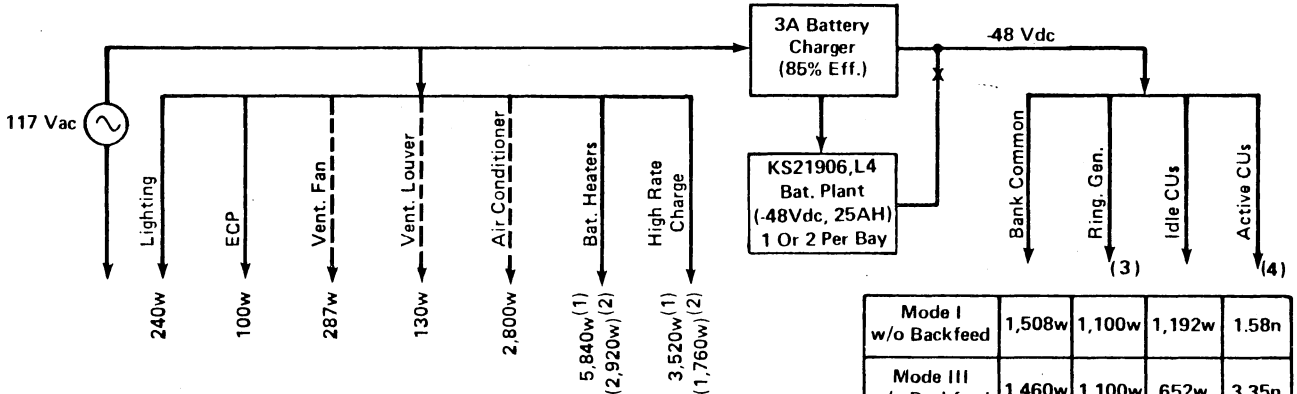
Notes:
(1) Two Bat. Strings/Bay
(2) One Bat. String/Bay
(3) Assumes 3% Of Lines Rung Simultaneously For POTS & 6% For SS
(4) n = # Lines Off-Hook

POWER DRAINS FOR FULLY EQUIPPED CEV

EXHIBIT 12

SECTION 640-250-901NB

EEE



Mode I w/o Backfeed	1,508w	1,100w	1,192w	1.58n
Mode III w/o Backfeed	1,460w	1,100w	652w	3.35n
Mode I w/Backfeed	3,620w	1,100w	1,192w	1.58n
Mode III w/Backfeed	2,728w	1,100w	652w	3.35n

Notes:
(1) Two Bat. Strings/Bay
(2) One Bat. String/Bay
(3) Assumes 3% Of Lines Rung Simultaneously For POTS & 6% For SS
(4) n = # Lines Off-Hook

POWER DRAINS FOR FULLY EQUIPPED EEE