

**J86266A RECTIFIER,
130 VOLTS, 24 AMPERES
OPERATING METHODS**

CONTENTS	PAGE
1. GENERAL	1
2. TOOLS AND TEST APPARATUS	2
3. OPERATION	2
4. ROUTINE CHECKS	2
5. TROUBLES	7
 Figures	
1. Simplified Schematic of J86266A Rectifier	3
2. Simplified Schematic of Control Unit for J86266A Rectifier	5
3. J86266A 130-Volt, 24-Ampere Rectifier	6

1. GENERAL

1.01 The J86266A semiconductor rectifier, using booster control regulation, is adaptable for connection to a 200- to 250-volt, 60-Hz single-phase power source and will deliver a continuous direct current of 24 amperes at 130 volts. The output current may be controlled manually by means of keys provided on the rectifier, or automatically either by means of an associated power plant or a charge control unit mounted in the rectifier cabinet. The rectifier was initially intended to provide filtered dc power for charging and floating storage batteries used with the 410A and 410B power plant.

Danger: The voltages in this unit exceed 200 volts to ground. Avoid all contact with terminals. Do not

allow a test pick to touch two metal parts at the same time as destructive and dangerous short circuits may occur. Even with the ON-OFF key in the OFF position, the power supply is connected to several terminals inside the unit and the battery connections are not opened. Remove all ac fuses and the dc charge and regulation fuses associated with the rectifier before working on the inside of the unit.

1.02 This section is reissued for the following reasons:

- To delete the use of the KS-14510 volt-ohm-milliammeter
- The addition of the KS-20599, L4, digital multimeter and KS-8039 volt-milliammeter
- To make specific changes in the adjustment procedures of the OL and FL relays.

Revision arrows are used to emphasize the more significant changes. This reissue does not affect the Equipment Test List.

1.03 Options are provided for charging either a positive- or negative-grounded battery. With either option, the LOAD ammeter is in the grounded lead.

1.04 The control circuit covered by Fig. 1 and 2 of SD-81302-01, when furnished, is used with the J86266A rectifier to supply constant current to an existing plant.

1.05 Rectifiers of early design were equipped with selenium rectifying elements and may be converted to use silicon elements. Rectifiers

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SECTION 169-622-301

manufactured later are equipped with silicon rectifying elements.

1.06 C1 Contactor: The operating coil of the C1 contactor is energized by the voltage from the associated battery. Difficulty may be experienced in restarting the rectifier if there is a low-voltage battery condition. See paragraph 5.03.

1.07 Keeping the ventilating passages and rectifier cells clean is especially important to avoid excessive heating.

1.08 Routine checks are intended to detect defects, particularly in infrequently operated parts of the equipment, and insofar as possible to guard against circuit failures which interfere with service. Checks and adjustments, other than those required by trouble conditions, should be made during a period when there will be a minimum interference with service.

1.09 The instructions are based on drawing SD-81302-01. For detailed description of the operation, see the corresponding circuit description.

1.10 For more detailed information on the operation and maintenance of individual equipment or apparatus, refer to the appropriate Bell System Practices.

2. TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
KS-6320	Orange Stick
—	3-Inch C Screwdriver
TEST APPARATUS	
◆KS-20599, L4	Digital Multimeter
KS-8039	Volt-Milliammeter or equivalent◆

3. OPERATION

3.01 Preparing to start: When preparing to put the rectifier into service, check that:

- (a) The ac power supply, dc charge, and regulation fuses with the proper amperage values are inserted.
- (b) The AC circuit breaker is in the open position.
- (c) The ON-OFF key is in the OFF position.
- (d) The NOR-TST key is in the NOR position.
- (e) All external connections are made in accordance with the SD- drawing covering the associated circuit of which the rectifier is a part.

3.02 Starting: To put the rectifier in service, proceed as follows:

- (a) Place the AC circuit breaker in the closed position.
- (b) Apply the input power by operating the ON-OFF key to ON.

3.03 Stopping: Operate the ON-OFF key to the OFF position and check that the motor adjusts the TR transformer to the minimum output condition and operates the L limit switch. If the rectifier is to be left out of service, remove the ac power supply, dc charge, and regulation fuses and disconnect the load.

4. ROUTINE CHECKS

4.01 Periodically operate the RAISE and LOWER keys and check that the output current raises and lowers accordingly.

4.02 Check that the alarm operates satisfactorily. See Sections 167-643-301 and 167-643-302.

4.03 Electrolytic capacitors should be maintained in accordance with Section 032-110-701.

4.04 Periodically inspect the relays for adjustment and condition of contacts to make sure that they are in accordance with the circuit requirement tables and sections that apply.

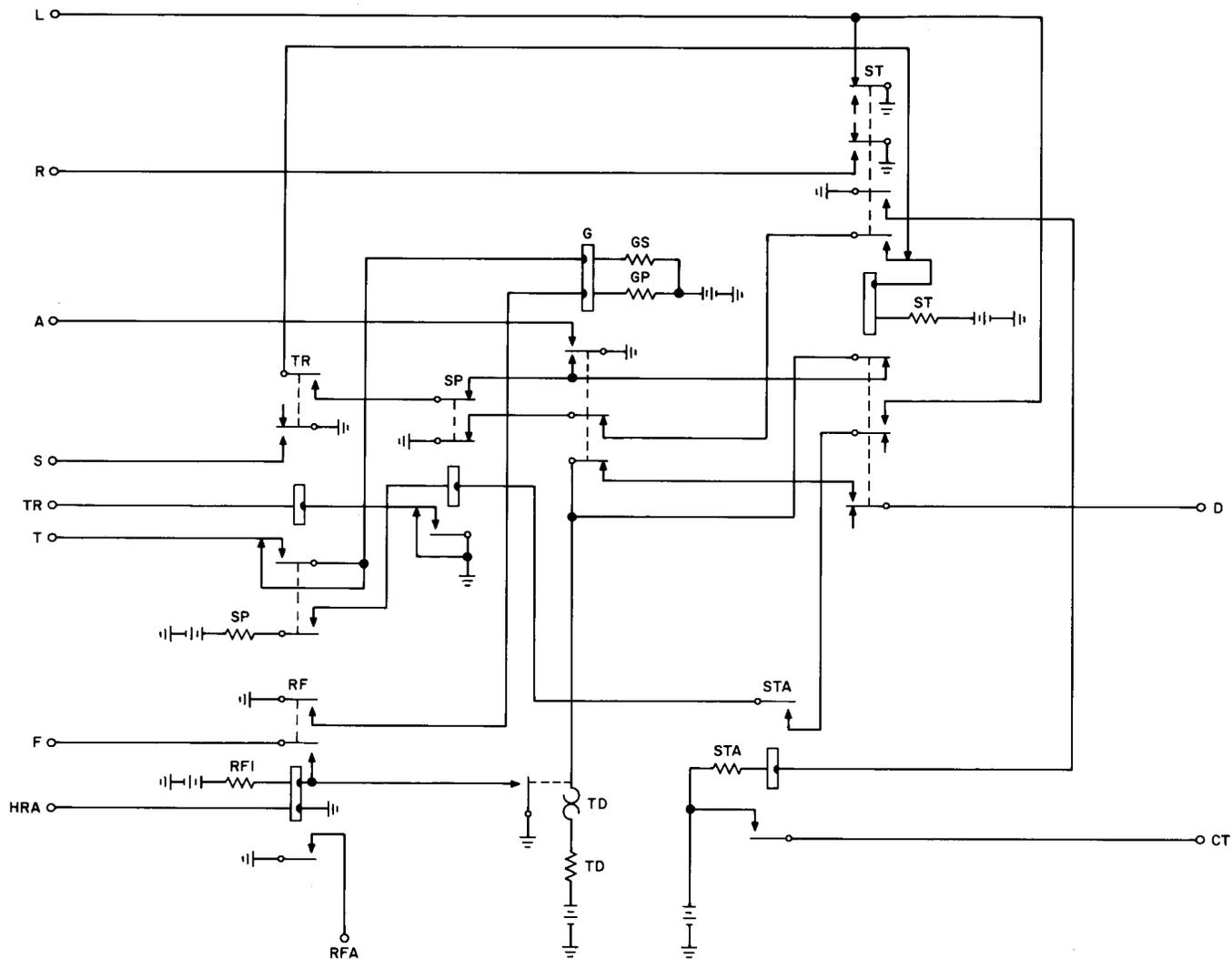


Fig. 2—Simplified Schematic of Control Unit for J86266A Rectifier

4.05 Circuit Check: Periodically check the OL, OLA, FL, and FLA relays for proper operation by proceeding as follows:

- (a) Change output of another rectifier in the connecting plant.
- (b) Discharge of battery.
- (c) Use of test load (see Section 171-123-101).

Note 1: When making the checks, make sure that an adequate office load or an adjustable load capable of carrying 27 amperes or more at 130 volts is available. The battery

must be connected in parallel with the load. The following expedients may be desirable in obtaining specific loads.

Note 2: If the OL and FL relays cannot be adjusted within the limits as stated in the following steps, then the "A" and "B" straps at R8 and R9 may be cut.

- (1) Operate the ON-OFF key to OFF.
- (2) Operate the NOR-TST key to the TST position.

(3) Block the 4-5 top contacts of the FLA relay closed and block the 3-4 top contacts of the OLA relay open.

Caution: The rectifier is in manual operation. With the contacts of the OLA and FLA relays blocked, there is no overload protection. Do not raise the output above 27 amperes.

(4) Operate the ON-OFF key to ON.

(5) Operate the RAISE key until the rectifier output is 24 amperes.

◆**Requirement:** The FL relay operates at 24 amperes.

Note: If the requirement in (5) is met, proceed to (6). If the requirement is not met, adjust the FL ADJ rheostat until the FL relay operates at 22 to 25 amperes. See Fig. 3.

(6) Operate the LOWER key until the rectifier output is 22 amperes.

Requirement: The FL relay releases at 22 amperes.

Note: If the requirement in (6) is met, proceed to (7). If the requirement is not met, adjust the FLA ADJ rheostat until the FL relay releases at 1 to 4 amperes below the operate value in (5). See Fig. 3.

(7) Operate the RAISE key until the rectifier output is 26 amperes.

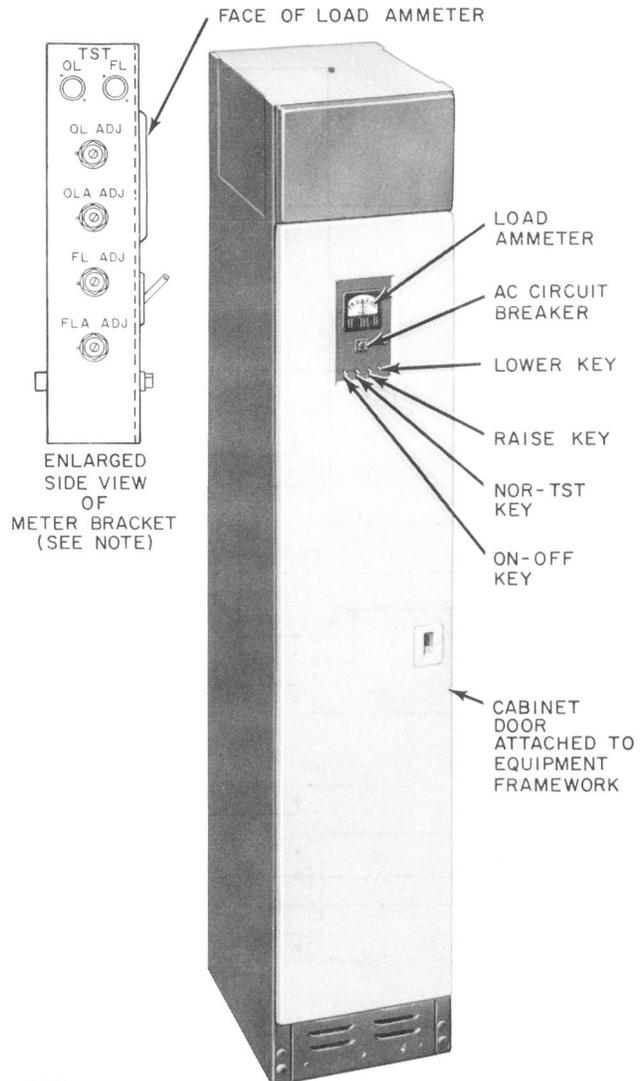
Requirement: The OL relay operates at 26 amperes.

Note: If the requirement in (7) is met, proceed to (8). If the requirement is not met, adjust the OL ADJ rheostat until the OL relay operates at 25 to 26 amperes. See Fig. 3.

(8) Operate the LOWER key until the rectifier output is 24 amperes.

Requirement: The OL relay releases at 24 amperes.

Note: If the requirement in (8) is met, proceed to (9). If the requirement is not met,



NOTE:
THE METER BRACKET IS MOUNTED ON THE EQUIPMENT FRAMEWORK INSIDE THE CABINET AND THE SCREWDRIVER CONTROLS ARE ACCESSIBLE WHEN THE DOOR IS PULLED FORWARD.

Fig. 3—J86266A 130-Volt, 24-Ampere Rectifier

adjust the OLA ADJ rheostat until the OL relay releases at 1 to 4 amperes below the operate value in (7). See Fig. 3.

(9) Operate the ON-OFF key to OFF.

(10) Operate the NOR-TST key to NOR.

(11) Remove the blocks from the 3-4 top contacts of the OLA relay and the 4-5

top contacts of the FLA relay. Verify that the caps and covers are in place on the relays.

(12) Disconnect the test load, if used.

(13) Operate the ON-OFF key to ON.⚡

5. TROUBLES

5.01 At times, troubles may be caused by faulty relay operation.

5.02 Control rheostats are totally enclosed and should be replaced if they become defective in any respect.

C1 Contactor Failure

5.03 The C1 contactor is held operated by the dc output of the rectifier and difficulty may be experienced in restarting the rectifier following an extended commercial power failure or plant failure which may have caused a low-voltage condition in the battery supply. In such cases, if the rectifier fails to start after the ON-OFF key has been operated to the ON position, manual operation of the contactor becomes necessary. Proceed as follows:

Danger: With the rectifier connected to the ac power supply, the voltages inside the unit exceed 200 volts to ground. When working inside the unit to operate the contactor manually, take care to avoid any bodily contact with terminals or exposed circuit parts.

(a) Pull the cabinet door forward to obtain access to the inside of the rectifier.

(b) Check and make sure that the PF relay (see Fig. 1 for location) is operated and that the movable arm of the TR autotransformer is at the maximum clockwise position of its travel.

Note: If the PF relay is not operated, operate and hold the LOWER key until the movable arm of the TR autotransformer has reached the maximum clockwise position of its travel. Release the LOWER key.

(c) To operate the C1 contactor, press against the contactor plunger using the KS-6320 orange stick.

(d) Hold the contactor operated for at least 45 seconds.

(e) After sufficient charging time to allow for the battery voltage recovery, push the cabinet door back to the proper position.

Rectifier Stack Replacement

5.04 *Selenium Rectifier Stacks:* Selenium rectifier cells may fail due to aging, which results in an increase in the resistance of the cells. The replacement of only the defective stack in rectifying elements that consist of more than one stack may result in an unbalanced condition in the rectifying element. To avoid unbalance, replace the stacks as follows:

(a) When replacing a defective stack or stacks in a multiple stack element, replace all other stacks in the element that have been in service 2 years or longer.

(b) Do not combine stacks of different list numbers or different manufacturers.

(c) Do not attempt to replace part of the rectifier cells in a stack or bolt assembly. Always replace the entire stack.

5.05 *Silicon Rectifier Stack:* Do not attempt to replace a diode in the stack assembly. When replacements are required, replace the entire stack.

Trouble Chart

5.06 Should any of the following troubles develop, it is suggested that the possible causes listed be checked. If the trouble is not found, look for loose or open connections, or short circuits due to foreign matter lying across wiring terminals. A loose connection generally causes heating. Any one of the following troubles may be caused by an open or short circuit or by aging or drift in the constants of some faulty component.

TROUBLE	POSSIBLE CAUSE
A. No dc output	<ul style="list-style-type: none"> (1) Failure or disconnection of the input power. (2) Blown ac supply fuse or charge fuse. (3) Contactor open. (4) Shorted filter capacitors. (5) Circuit breaker open. (6) Relays not operated.
B. Low dc current	<ul style="list-style-type: none"> (1) Low input voltage. (2) Breakdown of filter capacitors. (3) Incorrect transformer taps used. (4) Defective rectifying element. (5) Rheostats out of adjustment.
C. High dc current	<ul style="list-style-type: none"> (1) High input voltage. (2) Rheostats out of adjustment. (3) Incorrect transformer taps used.
D. Erratic dc current or voltage	<ul style="list-style-type: none"> (1) Loose connections at rheostats or resistors. (2) Intermittent open or short in any component.