
**L3 AND L4 CARRIER
COMMON EQUIPMENT
J68820 AUTOMATIC LINE SWITCHING
TESTS
SWITCHING SIGNAL OSCILLATOR**

The J68820B switching signal oscillator (Fig. 1) furnishes any of the seven frequencies which are used in the L3 and L4 automatic line switching arrangements. The purpose and location of each of the seven oscillators is given in Table A. The location of each switching signal oscillator is shown in Fig. 2.



Fig. 1—Switching Signal Oscillator Unit (J68820B)

This section provides procedures to:

- (a) measure the heater voltage of the oscillator tube.
- (b) test the action of the alarm relay and adjust the oscillator output current to 1.1 mA.
- (c) measure the output power of the oscillator.

TABLE A

SWITCHING SIGNAL FREQUENCIES			
GROUP (J68820)	UNIT	FREQUENCY (KHZ)	PURPOSE
A	STBY INIT	290	Identification
A, AA & AB	REG INIT 1	290	Identification
A, AA & AB	REG INIT 2	288	Identification
A, AA & AB	REG INIT 3	286	Identification
A, AA & AB*	REG INIT 4	284	Identification
A	COMM SW CONT	282	Release signal
A	COMM SW CONT	280	Release check signal
A	DIRECTOR	296	Verification signal
* Applies only to 11-foot 6-inch bays.			

This section is reissued to show the correct illustration for Figure 3. *Equipment Test Lists are not affected.*

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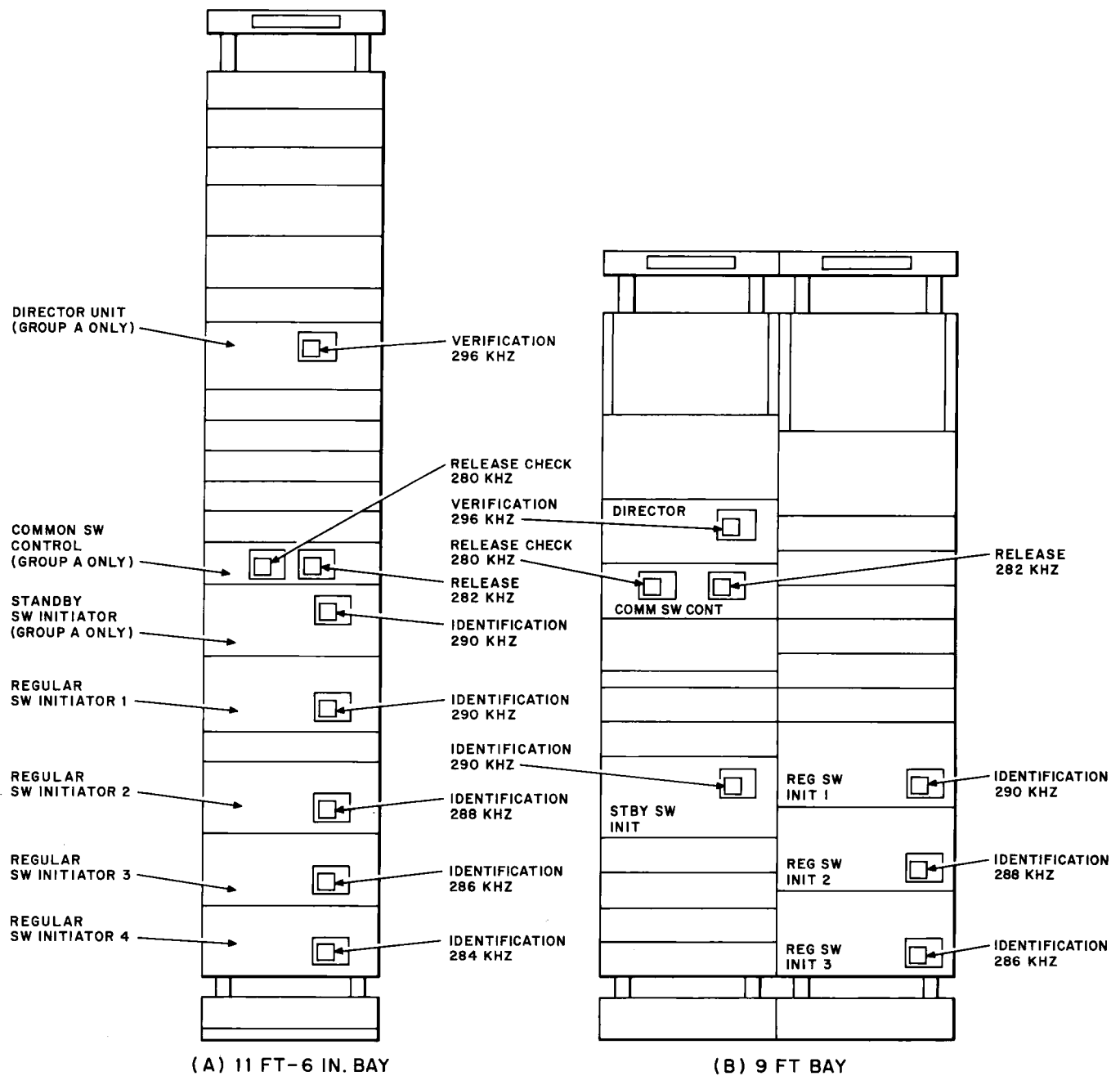


Fig. 2—Location of Switching Signal Oscillators in Switch Control Bay

CHART 1

TUBE HEATER TEST

APPARATUS

KS-14510 Volt-Ohm-Milliammeter (VOM)

Note: No substitute should be used.

STEP

PROCEDURE

A. Director Unit

- 1 Set the selector switch on the VOM to the 0.3 DC VOLT position.
- 2 Set the TUBE TST selector switch on the director unit to DIR VER OSC V1 (see Fig. 3).

Note: A series resistor in the director unit converts the full scale of the VOM to 30 volts.

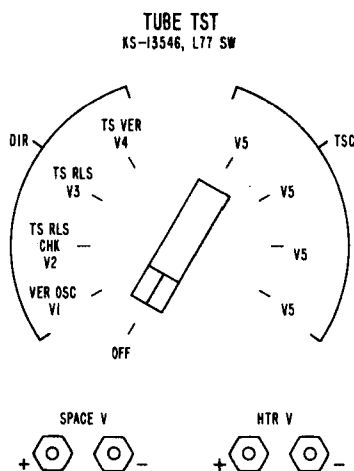


Fig. 3—TUBE TST Selector Switch on Director Unit

- 3 Connect the VOM to the HTR V test jacks (see Fig. 3).
- 4 Measure the heater voltage.

Requirement: 20 volts maximum
19.5 volts minimum

CHART 1 (Cont)

STEP

PROCEDURE

- 5 If the requirement of Step 4 is met, proceed to Step 8. If it is not met, resistor strapping may be incorrect. Proceed to Step 6.

Note: Before attempting to change the strapping on the resistor, *the switching system under test must be locked normal at the L3 miscellaneous bay or at the L4 control connecting bay.*

- 6 At the rear of the switch control bay, remove the director cover.

Note: The resistors are located to the right of the 296-kHz oscillator unit.

- 7 Add and remove straps on the resistors (R52 through R57) to meet the requirement of Step 4.

Note: Refer to SD-59652-011 for additional information.

- 8 Disconnect the VOM and set the TUBE TST switch in the OFF position.

B. Common Switch Control Unit

- 9 With the VOM remaining in the 0.3 DC VOLT position, connect the leads to the HTR V jacks on the common switch control unit (see Fig. 4).

Note: A series resistor in the common switch control unit converts the full scale of the VOM to 30 volts.

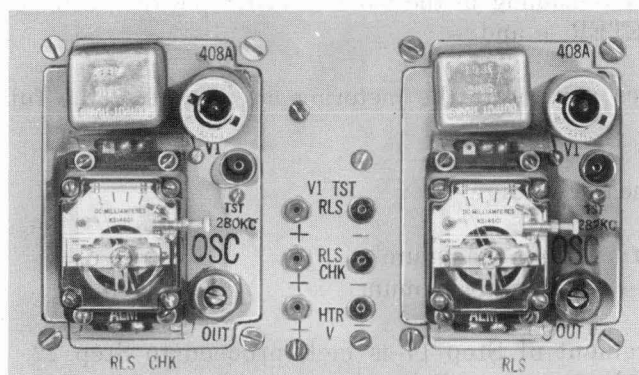


Fig. 4—Oscillators and Test Jacks on Common Switch Control Unit

CHART 1 (Cont)

STEP	PROCEDURE
10	Measure the heater voltage. Requirement: 20 volts maximum 19.5 volts minimum
11	If the requirement of Step 10 is met, proceed to Step 14. If it is not met, resistor strapping may be incorrect. Proceed to Step 12. Note: Before attempting to change the strapping on the resistors, <i>the switching system under test must be locked normal at the L3 miscellaneous bay or at the L4 control connecting bay.</i>
12	At the rear of the switch control bay, remove the common switch control cover. Note: The resistors are located to the left of the 282-kHz oscillator unit.
13	Add or remove straps on the resistors (R35 through R40) to meet the requirement of Step 10. Note: Refer to SD-59463-02 for additional information.
14	Disconnect the VOM. C. Initiator Unit
15	Set the MTR selector switch of the initiator under test to the HTR V position (see Fig. 5).
16	With the VOM remaining in the 0.3 DC VOLT position, connect the leads to the test jacks designated METER + and -. Note: A series resistor in the metering circuit makes the full-scale meter reading equal to 30 volts.
17	Measure the heater voltage. Requirement: 20 volts maximum 19.5 volts minimum
18	If the requirement of Step 17 is met, proceed to Step 22. If it is not met, resistor strapping may be incorrect. Proceed to Step 19. Note: Before attempting to change the strapping on the resistors, <i>the switching system under test must be locked normal at the L3 miscellaneous bay or at the control connecting bay.</i>
19	At the rear of the switch control bay, remove the initiator cover.

CHART 1 (Cont)

STEP

PROCEDURE

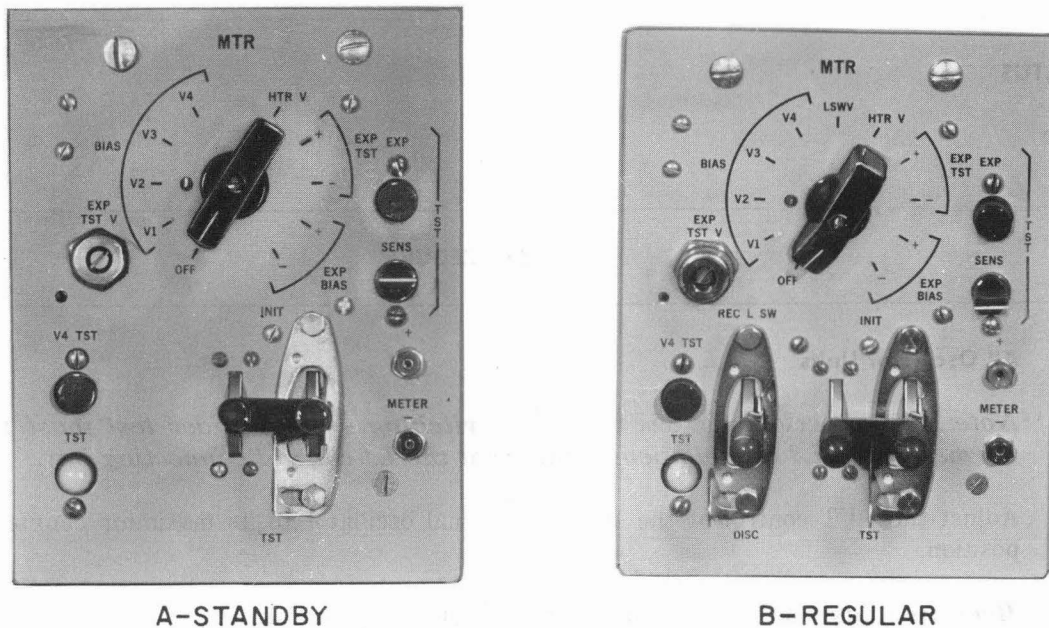


Fig. 5—Metering Panels for Regular and Standby Initiators

- 20 Locate the resistors as follows:
- (a) Regular initiator: under tubes V6 and V7
 - (b) Standby initiator: to the left of V6 and V7.
- 21 Add or remove straps on the resistors (R105 through R113) to meet the requirement of Step 17.
- Note:** Refer to SD-59464-02-7 for additional information.
- 22 Disconnect the VOM and set the MTR switch to the OFF position.

CHART 2

ALARM TEST

The ALM relay on each switching signal oscillator is a meter relay. This meter relay combination is in series with a rectifier so that its reading is proportional to the output of the oscillator. A meter reading of 1.1 mA corresponds to an output power of +4 dBm.

APPARATUS

None

STEP

PROCEDURE

All Oscillator Units

Note: Before performing this test, *the switching system under test must be locked normal at the L3 miscellaneous bay or at the L4 control connecting bay.*

- 1 Adjust the OUT control of the switching signal oscillator to its maximum counterclockwise position.

Requirements: (a) The office minor alarm sounds.
(b) Visual office alarms operate.
(c) The OSC FAIL lamp lights. (This lamp is located on the jack mounting strip in the L3 miscellaneous bay or in the L4 control connecting bay.)

- 2 Momentarily operate the ACO key on the mounting strip in the associated J68820 switch control bay.

Requirements: (a) The office minor alarm is silenced.
(b) The visual alarm lamp is extinguished.

- 3 Depress and hold depressed the ALM relay reset pushbutton located on the side of the relay meter.

- 4 Adjust the OUT control on the oscillator and release the reset pushbutton.

Requirements: (a) A 1.1-mA reading on the relay meter.
(b) The OSC FAIL lamp is extinguished.

- 5 If requirement (a) of Step 4 is not met, replace the tube in the oscillator and repeat Steps 1 through 4. If the required oscillator output still cannot be obtained, perform tests prescribed in Chart 3 of this section.

CHART 3

OUTPUT POWER MEASUREMENT

APPARATUS

Transmission test equipment

Refer to Section 356-010-500 and select, from available equipment a receiving unit having the following capabilities:

Receiving test equipment capable of detecting, from 75-ohm circuits, signals between 200 kHz and 300 kHz at a level from zero to -30 dBm.

In addition, the following are required:

11B Attenuator, or equivalent

P2BJ Cord

STEP

PROCEDURE

- 1 Prepare the RTE (receiving test equipment) for a bridging-type measurement at the frequency of the oscillator under test. The level should be set for approximately -25 dBm.

Note: The frequencies are listed in Table B.

- 2 Connect the 11B attenuator to the TST jack on the oscillator under test (see Fig. 6).
- 3 Connect the RTE to the 11B attenuator [patch (1), Fig. 6].

Note: The 30-dB loss of the 11B attenuator must be considered in any measurements made.

- 4 Read the indication on the RTE.

Requirement: Between -23 and -26 dBm.

Note: The actual power at this point is between $+4$ and $+7$ dBm; i.e., -23 dBm minus 30 dB attenuator equals $+7$ dBm.

- 5 If the requirement of Step 4 is met, proceed to Step 7. If it is not met, replace the oscillator tube and repeat Steps 1 through 4.

CAUTION: Before removing the oscillator tube, the switching system under test must be locked normal at the L3 miscellaneous bay or at the L4 control connecting bay.

CHART 3 (Cont)

STEP

PROCEDURE

TABLE B

ADJUSTMENT OF SWITCHING SIGNAL OSCILLATOR OUTPUT POWER		
LOCATION OF OSCILLATOR	DESIGNATION	FREQUENCY (KHZ)
Director	Verifier	296
Common Switch Control	Release Check	280
	Release	282
Standby Initiator	Oscillator	290
1st Regular Initiator	Oscillator	290
2nd Regular Initiator	Oscillator	288
3rd Regular Initiator	Oscillator	286
4th Regular Initiator	Oscillator	284

Note: If the oscillator tube was replaced in Step 5 of Chart 2, do not replace the tube again.

- 6 If the requirement of Step 4 cannot be met by replacing the tube, substitute one of the spare varistors in the oscillator under test by performing the following procedure.

- (a) Ensure that the associated switching section is out of service (locked normal).
- (b) Remove the rear cover of the unit under test.
- (c) Remove the oscillator cover.
- (d) Locate varistor CR1 (see Fig. 7A).
- (e) Connect a new varistor in the circuit as follows:
 - (1) Remove the wires from terminals 2 and 3 as shown in Fig. 7B.
 - (2) Connect the wires between terminals 1 and 2, 4 and 5, or 5 and 6.

Note: Observe polarity of the varistor.

CHART 3 (Cont)

STEP

PROCEDURE

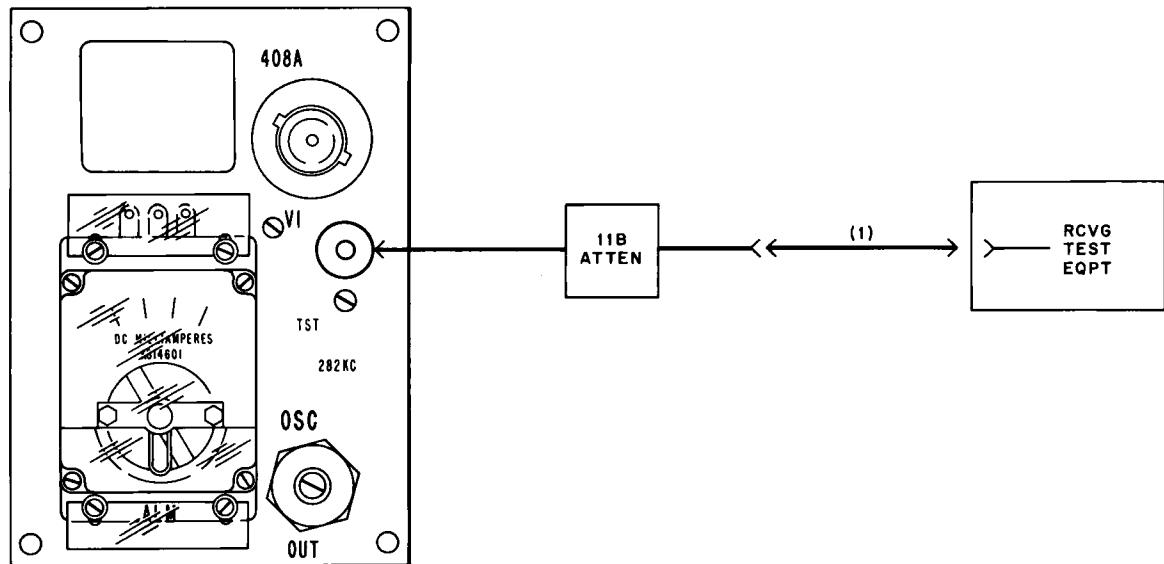
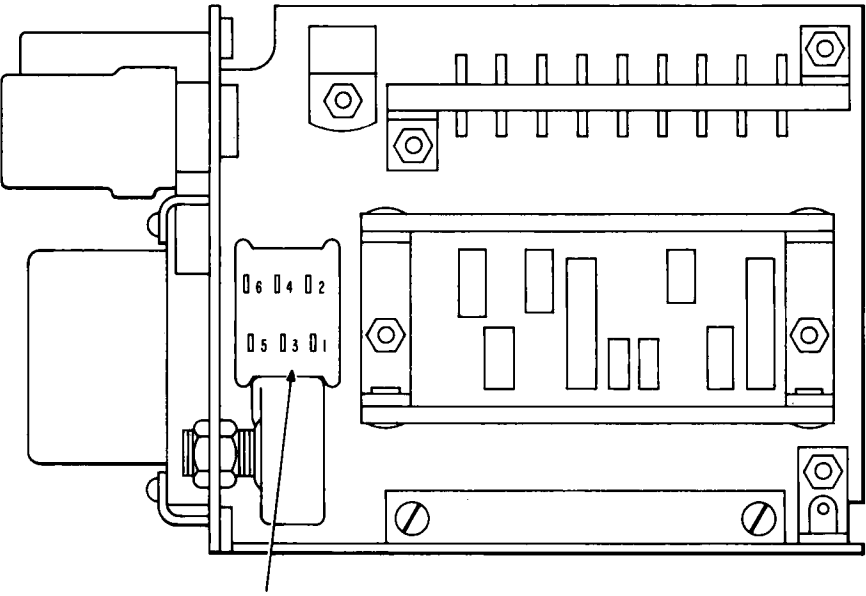


Fig. 6—Patching Arrangement to Measure Oscillator Output Power

- (f) Replace the rear oscillator cover.
- (g) Place the rear cover on the unit under test.
- (h) Repeat Steps 1 through 4 of this chart.

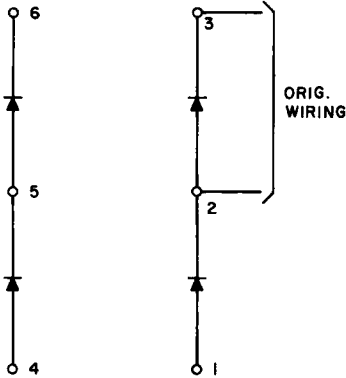
Note: If the oscillator tube or the varistor is replaced, the procedure in Chart 2 should be repeated.

- 7 Remove the 11B attenuator and the RTE from the oscillator.
- 8 Unlock the associated switching section.



VARISTOR (CR-1)

(A) SIDE VIEW OF OSCILLATOR UNIT



(B) VARISTOR ARRANGEMENT

Fig. 7—Varistor Location and Terminal Arrangement