ADDRESSABLE DATA STATION SWITCHING CIRCUIT SD-1G244-01, AND SITE CONTROL CIRCUIT SD-1G246-01 IDENTIFICATION, OPERATION, MAINTENANCE

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1. GENERAL

1.01 This section contains identification, operation, and maintenance information for the control features associated with Addressable Data SAGE/BUIC Phase III. See Section 981-272-100 for a general description of the Addressable Data System.

1.02 Addressable data provides the capability for a control center to dial the number or address of a bridge located at an AUTOVON switching center to obtain the desired data. Access to the bridge is via the dial restoration panel and auxiliary control panel (DRP/ACP). See Section 981-273-100 for a general description of dial restoration and auxiliary control.

1.03 Connection to the bridge is via direct point-to-point or switched access lines. The addressable data bridge is arranged to be controlled by any one of the four control centers desiring to transmit data back to the radar site. The radar site transmits data to all four control centers simultaneously. See Fig. 1 for a simplified block diagram. Fig. 2 is a functional drawing of the station switching circuit.

1.04 The remote radar site will normally be connected to the addressable data bridge input leg via a dedicated facility with a switched access route as a backup. If a failure occurs on the dedicated facility, the switched access can be used to transfer the dedicated access to the bridge. The site attendant, after dialing the 7-digit address via the 16-button TOUCH-TONE® dial, will operate the button designated A (flat-footed A) to transfer the direct access facility. The remote radar site is then connected to the input leg of the bridge via the switched access AUTOVON facility.

Caution: Tests covered in this section cannot be performed without a release from the customer data maintenance control center (DMC/DMCC).

1.05 The following tests are covered in this section.

A. Taking Control of a Distant Addressable Data Bridge from the Station Switching Circuit: This test verifies the shift of frequency tones from 390 to 460Hz to produce pulses for the purpose of gaining control of a distant addressable data bridge. Lamp signals indicate when control has been obtained.

B. Distinguishing Control Signals of 390 and 460Hz from a Digital Data Receiving Circuit: This test will indicate, by means of relay operation, the presence of 390 or 460Hz and provide lamp indications to acknowledge these tones.

C. Timing Feature: This test covers the 7 to 10-second timing device to indicate loss of line continuity and provides a visual and audible alarm.

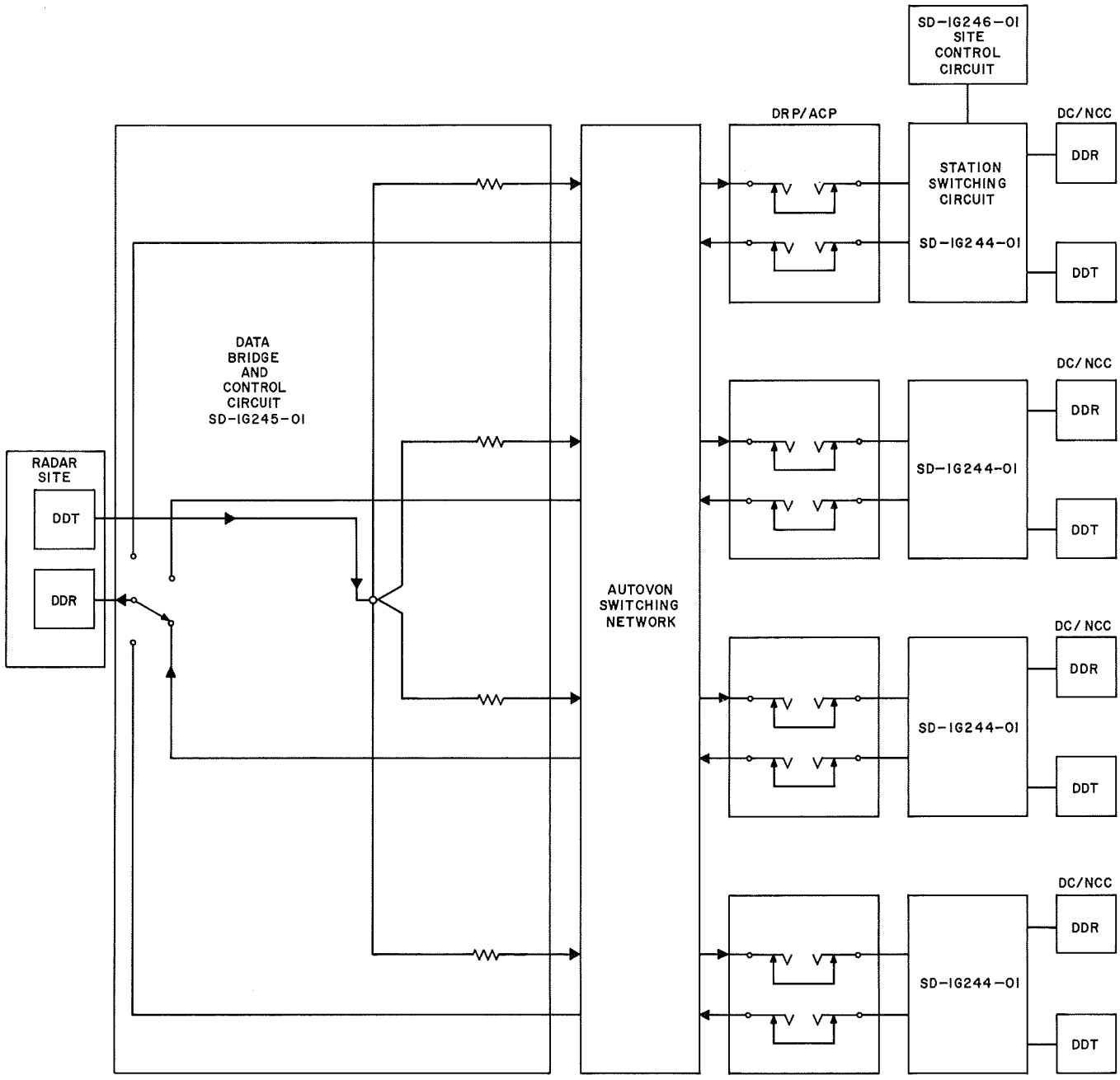

Fig. 1—Addressable Data Bridge and Control Circuit for SAGE/BUIC III

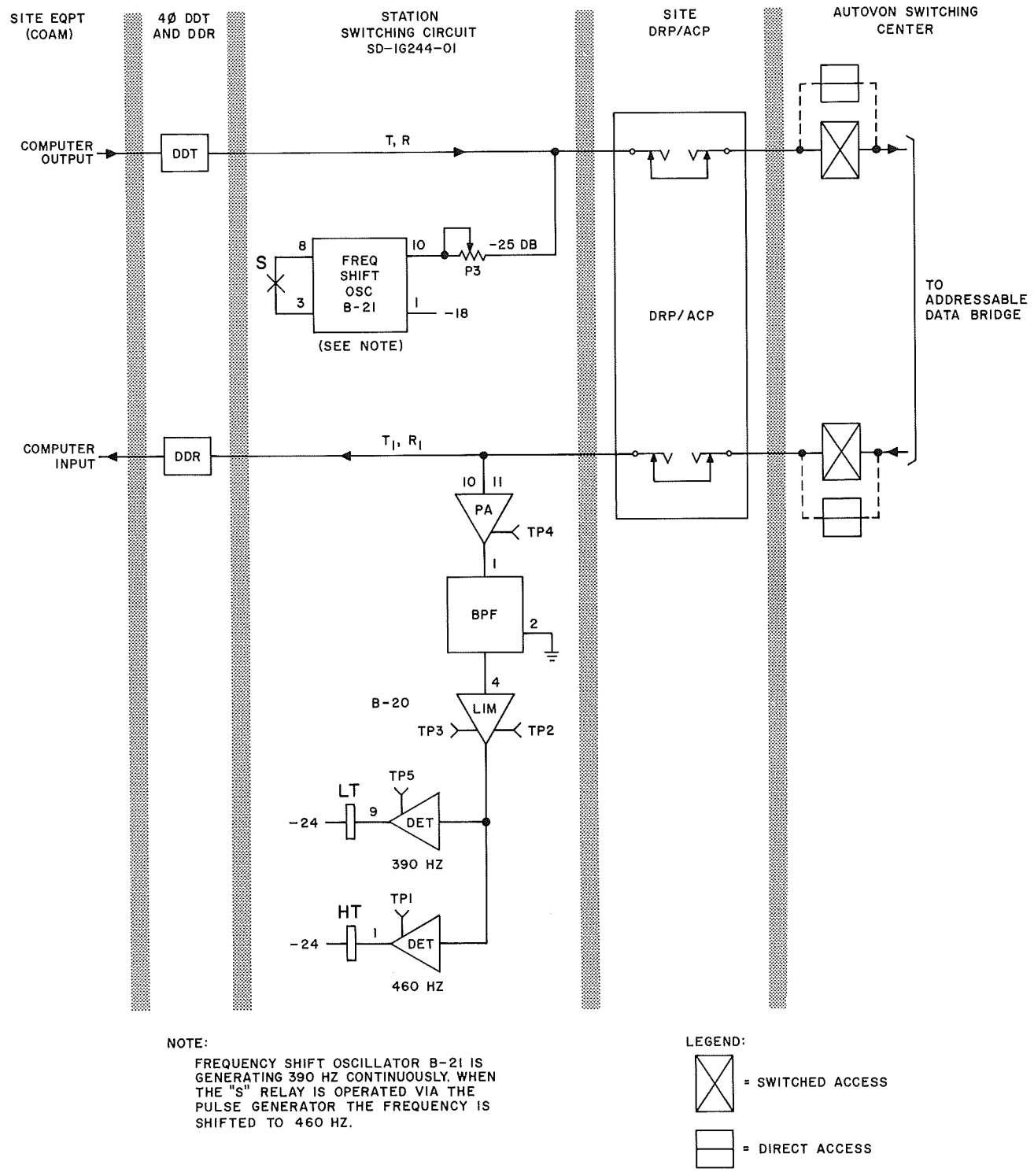

Fig. 2—Station Switching Circuit Diagram

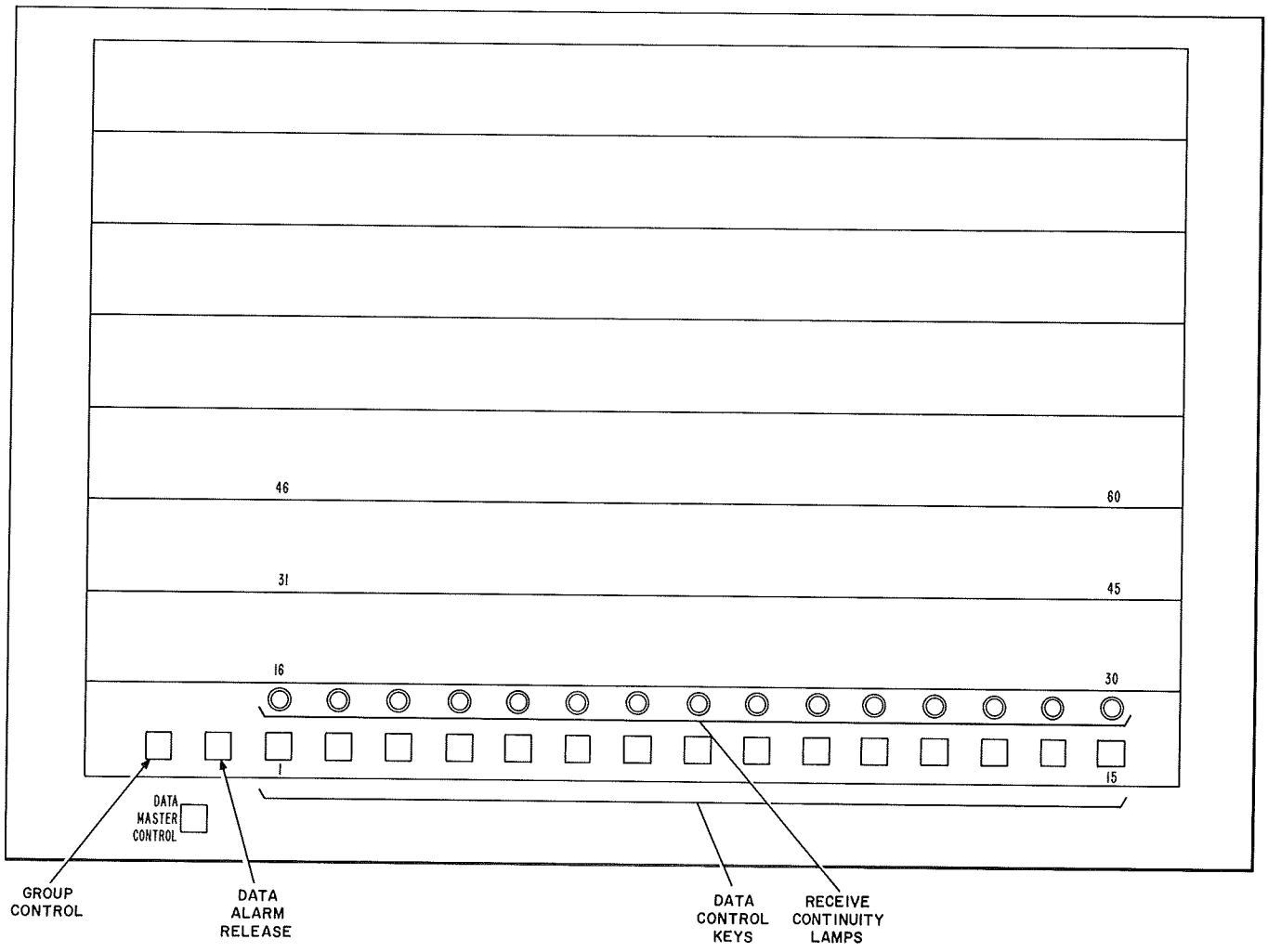

Fig. 3—Addressable Data Control Panel Located at DC/NCCs

D. Remote Control from the Site Control Circuit: This test verifies the operation of the take-control key from a BOMARC site and provides control and continuity lamp indications.

2. IDENTIFICATION

STATION SWITCHING CIRCUIT

2.01 ***Station Switching Circuit*** consists of a control panel, transmission and control relay unit, and a data pulse generator relay unit. The data control panel (J53022JN) is mounted on the upper portion of the ACP, occupying a space 14-1/4 inches high by 24 inches wide. It comes equipped with framework, wiring assembly, equipment for 60 control units, and provisions for an additional 60 in multiples of 15. Each group of 15 comes with one group control (GROUP CONT) and one data alarm release key (DATA ALM RLS) as well as 15 individual control keys (CONT) and 15 receive continuity lamps (REC CNTY). One MASTER CONTROL key is included for the control panel (see Fig. 3). Individual CONT keys not required to be under the control of the GROUP or MASTER CONTROL keys shall have the CR1 diode located on the rear of the CONT key disconnected locally.

2.02 ***Addressable Data Transmission and Control Unit (J53022JR)*** consists of two circuits occupying space of three 2- by 23-inch mounting plates. One circuit is needed for each control unit. They are mounted in the telephone company equipment room on miscellaneous relay racks. (See Fig. 4.)

2.03 ***Addressable Data Pulse Generator Relay Unit (J53022JS)*** consists of two circuits occupying space of one 2- by 23-inch mounting plate. One circuit is needed for each 15 control units; they are mounted in the telephone company equipment room on miscellaneous relay racks. (See Fig. 5.)

REMOTE SITE CONTROL CIRCUIT

2.04 ***Site Control Circuit*** has been developed as a remote control for the station switching circuit. It is intended for use at BOMARC sites and allows the attendant to request control, to monitor line status, and to receive and silence alarms. It connects to the station circuit at the DCs and NCCs via locally engineered DC loop facilities. The remote site control circuit consists of the following:

(a) ***Transfer Control Unit*** for small sites with data, trunk transfer, and addressable data control panel, desk mounted console (J53022JP). (See Fig. 6.)

(b) ***Site Control Relay Unit*** occupying space of two 2- by 23-inch mounting plates for ten circuits (J53022JV). (See Fig. 7.)

(c) ***Center Control Relay Unit*** (located at control centers) occupying space of two 2- by 23-inch mounting plates for ten circuits (J53022JW). (See Fig. 8.)

3. OPERATION

3.01 Assuming the DRP/ACP attendant has dialed up the desired bridge, the following actions take place when a request for control of the bridge is transmitted from the CONT key at the station switching circuit.

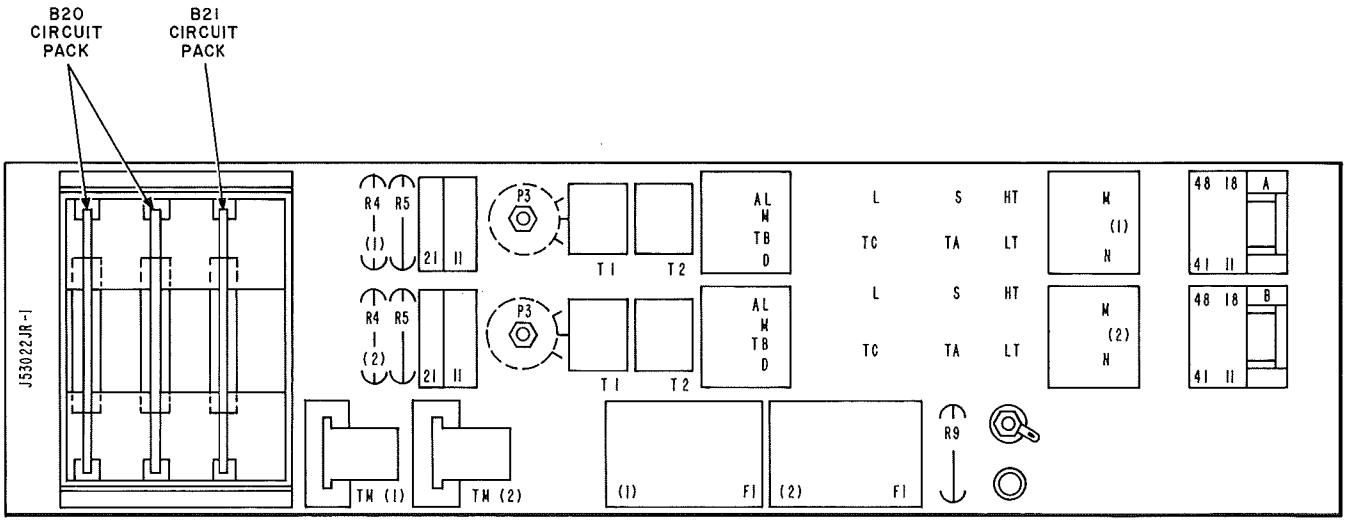

Fig. 4—Transmission and Control Unit

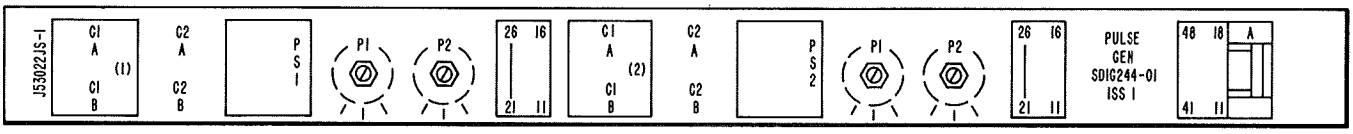

Fig. 5—Pulse Generator Unit

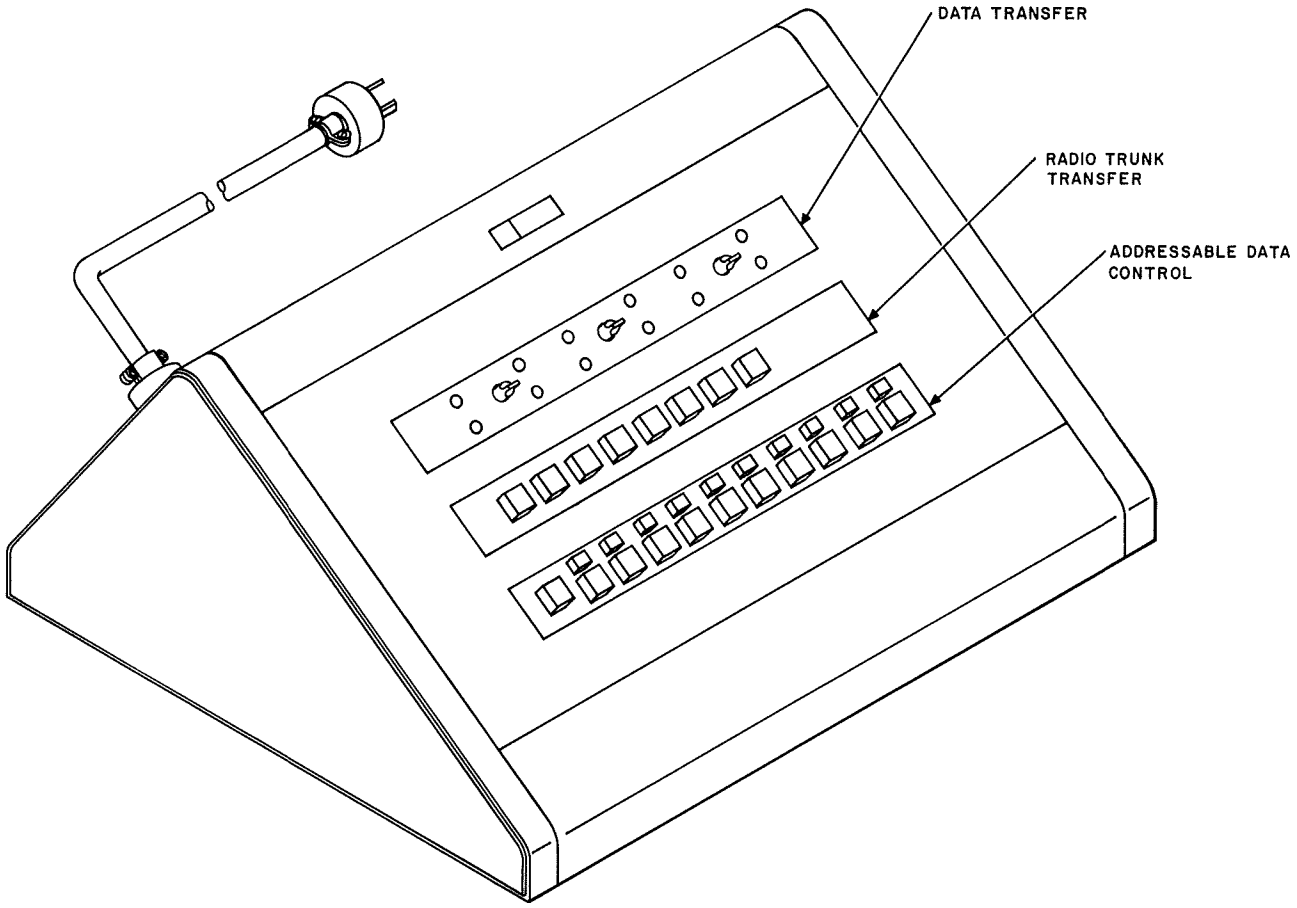

Fig. 6—Transfer Control Unit for BOMARC Site

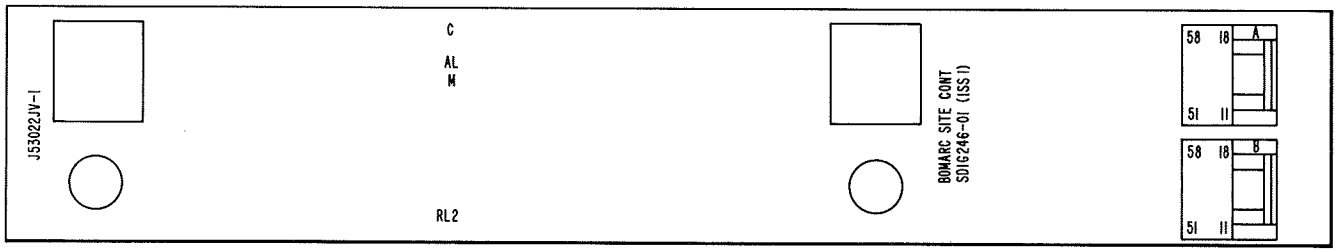

Fig. 7—Site Control Relay Unit

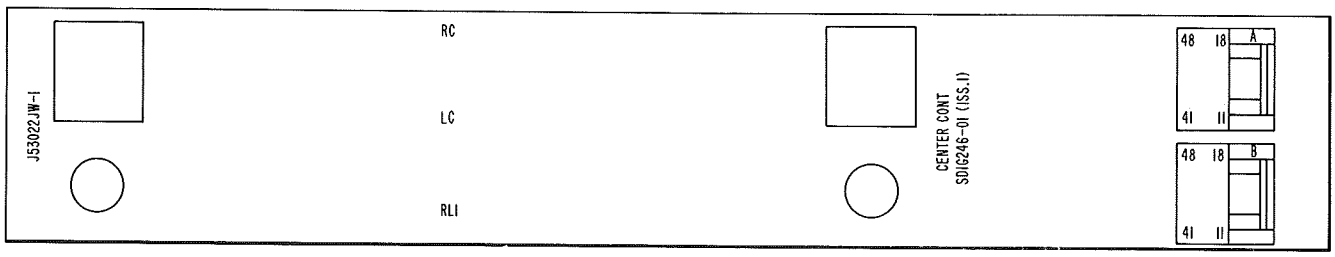

Fig. 8—Control Center Relay Unit for Remote Control

3. OPERATION (Cont)

STEP	ACTION	VERIFICATION
	A. Taking Control of a Distant Addressable Data Bridge from the Switching Circuit	
1	Attendant momentarily operates CONT key.	At the auxiliary control panel (ACP)— CONT key lamp may flash at this time. *Note:* Verifications preceded by a parenthesis need not be checked unless the initial verifications are not received. (TC relay operates and locks. (M relay operates and locks. (S relay operates and releases twice. (N relay operates and locks. (M relay releases. At ACP— CONT key lamp lighted steadily.
	B. Distinguishing Control Signals of 390 and 460Hz from a Digital Data Receiving Circuit	
	Receipt of 460Hz Tone	
1	Attendant momentarily operates CONT key.	Same as Step 1 in Test A. At station switching circuit— (HT relay operates. (L relay operates and locks. (TC relay releases. (N relay releases. At ACP— CONT key lamp lights steadily.

STEP	ACTION	VERIFICATION
Receipt of 390Hz Tone		
2	No action required.	At station switching circuit— (LC relay released. At DRP— ST lamp lighted.
C. Timing Feature		
1	Attendant opens incoming line from the bridge.	At station switching circuit— (HT and LT relays released. (TM timer starts. (7 to 10-second timer relay operates. (TA relay operates. (TPD relay operates momentarily. (GRD ST lead starts 60-ipm interrupter. (ALM relay operated and locked to ALM RLS key. At DRP— ALM lamp flashing. At ACP— REC CNTY lamp flashing. Buzzer sounds. At site switching circuit— (LC relay operating at 60-ipm interval.
2	Attendant momentarily operates DATA ALM RLS key.	At ACP— Buzzer silenced. At station switching circuit— (ALM relay releases. At ACP— REC CNTY lamp lights steadily. At station switching circuit— (LC relay released. At DRP— ST lamp lighted.
Losing Control of the Bridge to Another Control Center		
3	No action required.	At station switching circuit— 460Hz changes to 390Hz from bridge. At ACP— CONT lamp flashing. Buzzer sounds. At station switching circuit— (ALM relay operates. (HT relay releases. (LT relay operates.

STEP	ACTION	VERIFICATION
4	Attendant momentarily operates DATA ALM RLS key.	At ACP— CONT key lamp extinguished. Buzzer silenced. (TC relay released. (N relay released. (LT relay operated.

D. Remote Control from the Site Control Circuit

1	Attendant operates TC key at remote site and holds operated.	At transfer control unit (TCU)— CA lamp may flash. At station switching circuit— (RC relay operated. (TC relay operates. At site control circuit— (C relay may operate at 60 ipm.
2	TC key remains held operated.	At station control circuit— (LC relay may operate at 60 ipm. 460Hz control tone received from bridge. (LC and C relays operated at TCU. CA lamp lighted steadily.
3	Attendant releases TC key at site.	

4. MAINTENANCE OF STATION SWITCHING CIRCUIT

4.01 Due to the reliability required for this system, it is recommended that spare circuit packs be provided for maintenance to minimize outage time caused by equipment failures.

4.02 Located in the 305 S/S equipment room are jacks associated with the addressable data circuits. This jack field takes the space of the upper half of two 7-foot relay racks. A rack mounted writing shelf is associated with these facilities (J1G001-G1).

4.03 The following test equipment or equivalent is required to perform line-up and maintenance of the station switching circuit.

(a) 21A transmission measuring set (TMS) (J94021A).

(b) 72A frequency meter.

(c) Volt-ohmeter.

(d) Stopwatch.

(e) Pulse checking test set SD-96362-01 (J94723A).

(f) One cord 10 feet long equipped with a 310 plug on one end and two 360 tools equipped with a 639A tool on the other end.

(g) One cord 9 feet long (2W12A).

(h) One 651 relay contact connector holder.

(i) Blocking and insulating tools as required. Tools and their use are covered in Section 069-020-801.

4.04 Using a 2-conductor cord equipped with alligator clips, connect the DETECTOR-IN-JACK of the 21A TMS to terminals 48(T) and 38(R) of TS A or B on unit LJ53022JR. Adjust potentiometer P3 until meter reads -25 dbm.

Note: It is not recommended to perform this test in the above manner except for initial line-up. Transmission level adjustments can

be coordinated with the first serving central office, and thereby prevent possible interference with a working data circuit on unit LJ53022JR.

4.05 Adjustment of the 7B timer is accomplished by the adjustment screw located on the front end of the unit. With terminals 12 and 13 on the TM timer connected, adjust timer to operate the TPD relay in 7 to 10 seconds.

Note: During initial line-up, the timer must be removed unless the following tests are to be performed with continuity to the addressable data bridge.

4.06 The pulse generator is adjusted to operate PS relay for 50 msec, release for 50 msec, and reoperate for 50 msec when ground is applied to the start lead. Operate time is measured by pulses per second (pps) and release time is percent break. Both operate and release times are adjusted to 50 ±10 msec. The pps are adjusted by potentiometer P2 and the percent break by potentiometer P1.

(a) Operate PPS-PCB key to center position.

(b) Turn Cal-O potentiometer counterclockwise.

(c) Connect pulse checking test set as follows: -48V to the tip and ground to the sleeve of BATT G.

(d) Adjust Cal-O potentiometer for 0 percent break.

(e) Block C2B relay nonoperated.

(f) Connect ring of P jack to 1M contact of PS relay.

(g) Operate PPS-PCB key to PCB position.

(h) Adjust potentiometer P1 for 50 percent break.

(i) Operate PPS-PCB key to PPS position.

(j) Operate SCALE 20-40 key to the 20 position.

(k) Adjust potentiometer P2 for 10 pps.

4.07 Restore circuit to normal and disconnect test set and leads.

4.08 Connect the 72A frequency meter 600-ohm IN-JACK to terminals 48(T) and 38(R) of TS A or B. Observe a reading of 390Hz.

4.09 Block operated S relay in the transmission and control circuit under test and observe a reading of 460Hz on the 72A frequency meter.

4.10 Remove block from S relay; observe on the 72A frequency meter that the reading returns to 390Hz.

4.11 Block operated TA relay and observe that there is no reading on the 72A frequency meter. (Operated TA relay stops the oscillator output.)

4.12 Remove block from TA relay and disconnect the 72A frequency meter. Repeat 4.08 through 4.12 for each transmission and control circuit provided.

4.13 Using the 21A TMS, connect the OSC OUT jack to terminals 28(T1) and 18(R1) of TS A or B. Adjust the 21A TMS oscillator to read -28 dbm at a frequency of 460Hz. Observe that HT relay of the transmission and control circuit under test operates and the control lamp at the ACP is lighted.

4.14 Leaving the 21A TMS connected, as in 4.13, readjust the oscillator to a -28 dbm at a frequency of 390Hz. Observe that LT relay operates and the control lamp at the ACP is extinguished.

4.15 Disconnect the 21A TMS and plug in the TM timer circuit pack. Observe that after 10 seconds ±1, the TA relay operates, REC CNTY lamp flashes, TPD relay operates momentarily, ALM relay operates and locks, and audible buzzer sounds at the ACP. If the line is open between DRP and bridge, the ALM lamp at the DRP will not be lighted, but the ST lamp will remain lighted.

4.16 Momentarily operate the DATA ALM RLS key. Observe that the buzzer is silenced, the ALM relay releases, and the REC CNTY lamp is lighted steadily at the ACP.

4.17 Unplug the TM timer once again. Observe that the TA relay releases and the REC CNTY lamp remains lighted. Repeat 4.13 through 4.17 for each transmission and control circuit provided.

4.18 Momentarily operate the CONT key at the ACP. Observe TC relay operates and locks, CONT key lamp may flash at 60 ipm, M relay operates and locks, and S relay operates and releases twice. N relay operates and locks; after N relay operates, M relay releases.

> ***Note:*** If more than one operation of the CONT key is necessary in order to observe all the above relays operate and release, momentarily operate the DATA ALM RLS key and the circuit will restore to normal. Reoperate the CONT key and observe all operations in 4.18.

4.19 Connect the OSC OUT jack of the 21A TMS to terminals 28(T1) and 18(R1) of TS A or B. Adjust the 21A TMS oscillator to a level of -28 dbm at 460Hz. Observe that HT relay operates, L relay operates and locks, TC and N relays release, and the CONT key lamp is lighted.

4.20 Leaving the 21A TMS connected, as in 4.19, change the output frequency to 390Hz. Observe that LT and ALM relays operate, the CONT key lamp flashes, and the buzzer sounds.

4.21 Momentarily operate the DATA ALM RLS key. Observe that ALM and L relays release, the CONT key lamp is extinguished, and the buzzer is silenced. Disconnect the 21A TMS and repeat the tests in 4.19 through 4.21 for each transmission and control circuit provided.

5. MAINTENANCE Of REMOTE SITE CONTROL CIRCUIT

5.01 Block ALM relay nonoperated at the site control circuit. Using a test receiver or test set, connect battery to the CL lead of the circuit under test. Observe that C relay operates and holds up to the battery applied by the test receiver. Observe, also, that lamp CA is lighted at the transfer control unit (TCU).

5.02 Remove battery from the CL lead, and observe that C relay releases and the CA lamp is extinguished.

5.03 Remove the block from ALM relay. Momentarily operate and release C relay. Observe that ALM relay operates and locks, the CA lamp lights, and the buzzer sounds.

5.04 Momentarily operate the AR key at the TCU. Observe that ALM relay releases, the CA lamp is extinguished, and the buzzer is silenced.

5.05 Hold operated the TC key at the TCU. Check the TC lead for a resistance battery reading. Momentarily operate and release C relay and observe that ALM relay does not operate.

5.06 Repeat 5.01 through 5.05 for each site control circuit provided.

> ***Note:*** Physical location of the equipment associated with the following tests will be in the DCs or NCCs adjacent to the BOMARC site.

5.07 At the station switching circuit associated with this center control relay unit, observe that N and HT relays are nonoperated.

5.08 Block operated RC relay at the center control relay unit. Observe that LC relay flashes at 60 ipm. (Refer to CAD3 on SD-1G246-01 for terminal strip and punching number.)

5.09 Remove block from RC relay and repeat 5.07 through 5.09 for each center control relay unit provided.