

**MODIFIED 83B1 SELECTIVE CALLING SYSTEM FOR  
AIRLINES RESERVATIONS USING REMINGTON RAND  
UNIVAC EQUIPMENT  
OPERATING TESTS**

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83B1 control station equipment modified in accordance with drawing CA-12463-SD and the outlying station units per drawing CA-15090-SD. The procedures are applicable to the following situations.

- (a) In testing the control units at the Western Electric Company distributing houses where they are assembled prior to shipment for installation to the customer's office.
- (b) In testing the individual units locally and also with the Serving Telegraph Test Center (STTC) at the time of installation.
- (c) In testing the complete system with all stations installed and connected to the interconnecting teletypewriter circuit as well as to the customer provided Remington Rand Univac file computer, programmer-scanner, and agent set locations.

**1. GENERAL**

**1.01** This Issue B cancels and supersedes Issue A and is reissued to remove references to CA-12462-SD, ED, and T which is rated A. and M. CA-15090-SD and ED has been issued to cover the wiring and equipment arrangements for outlying stations using Remington Rand Univac equipment in order to provide ease of manufacture and installation. References to modified 83B1 outlying stations are no longer applicable under the new drawing. No circuit changes have been made with the new equipment layout.

**1.02** This section outlines the operating tests for the modified 83B1 Selective Calling System arranged for operation with the Remington Rand Univac Airlines Reservations System. The test procedures are for use in testing the

**2. TELETYPEWRITER APPARATUS**

**2.01** The teletypewriter apparatus consists of the 28A sequence selector and No. 28 distributor associated with the control and outlying station units. A No. 14 keyboard typing reperforator will be provided at the Univac computer location for monitoring purposes and emergency communications with the programmer-scanner locations.

**2.02** The sequence selector and the distributor should be adjusted, lubricated and tested in accordance with the appropriate Bell System Practices prior to the start of tests.

**3. ASSEMBLY TESTS—OUTLYING STATION**

**3.01** *The following tests on the outlying station equipment units shall be made at the point of assembly prior to the shipment of*

*the equipment to the field for installation.* Drawing CA-15090-SD covers the wiring and interconnecting arrangements for the equipment units.

**3.02** The outlying programmer-scanner equipment components shall be assembled and interconnected as shown in drawing CA-15090-SD, Fig. 3. Connections to the ac service leads shall then be made and the rectifier adjusted in accordance with standard instructions to furnish a positive 130-volt output under "no-load" conditions. The key and lamp cabinet is connected to the control circuitry by means of separable connectors and shall be set in a convenient location where it will be accessible during the tests. Connect the leads from the key and lamp cabinet shown as connecting to the 63C1 loop switchboard into two local .060-ampere dummy circuits. Provide a receiving only and a keyboard sending and receiving teletypewriter arranged for the same speed of operation as the system under test and also arranged so that it can be connected into the dummy circuits. Also provide a source of automatic test signals such as from a No. 14 station type transmitter-distributor and a suitable test tape containing miscellaneous test signals. The test tape, however, must not contain FIGS or BLANKS.

**3.03** A locally constructed test circuit arrangement consisting of keys and lamps as shown in Fig. 1 or its equivalent, shall be provided to simulate the customer provided Univac programmer-scanner equipment. The procedures for testing the equipment at Western distributing houses as outlined in the following are based upon the use of this test circuit arrangement.

**3.04** Care should be taken that the sequence selector stunt box is arranged in accordance with Table A of drawing CA-15090-SD and that the unit is arranged to respond to the proper Transmitter Start Code (TSC), second letter code, for the station as specified in the order. Care should also be taken that the unit satisfactorily meets the bias tolerance tests as outlined in standard instructions.

**3.05** Connect the test circuit discussed in 3.03 to the outlying station unit under test by plugging it into the Z connector of the station control per Fig. 1, drawing CA-15090-SD.

**Test of Serial to Parallel and Parallel to Serial Conversion**

**3.06** The following basic codes are used in test descriptions.

- (a) TSC (Transmission Start Code)
- (b) V (No Traffic Response)
- (c) E (Start-of-Transmission Code)
- (d) T (End-of-Message Code)
- (e) HH (End-of-Transmission Code)

**3.07** Operate the MR key in the key and lamp cabinet. This key is used as a test key to disconnect the equipment from the Univac programmer-scanner equipment and to connect it to the test loop for testing the serial to parallel conversion feature. The STATION CUTOFF lamp in the test set should light.

**3.08** Connect the KSR teletypewriter to the .060-ampere dummy circuit terminating the leads to be normally connected to the regular loop. Connect the RO teletypewriter in the dummy circuit terminating the leads to be normally connected to the test loop. Send the following message from the KSR machine.

HH\*E<≡(Test Message) WPUYBFCHH

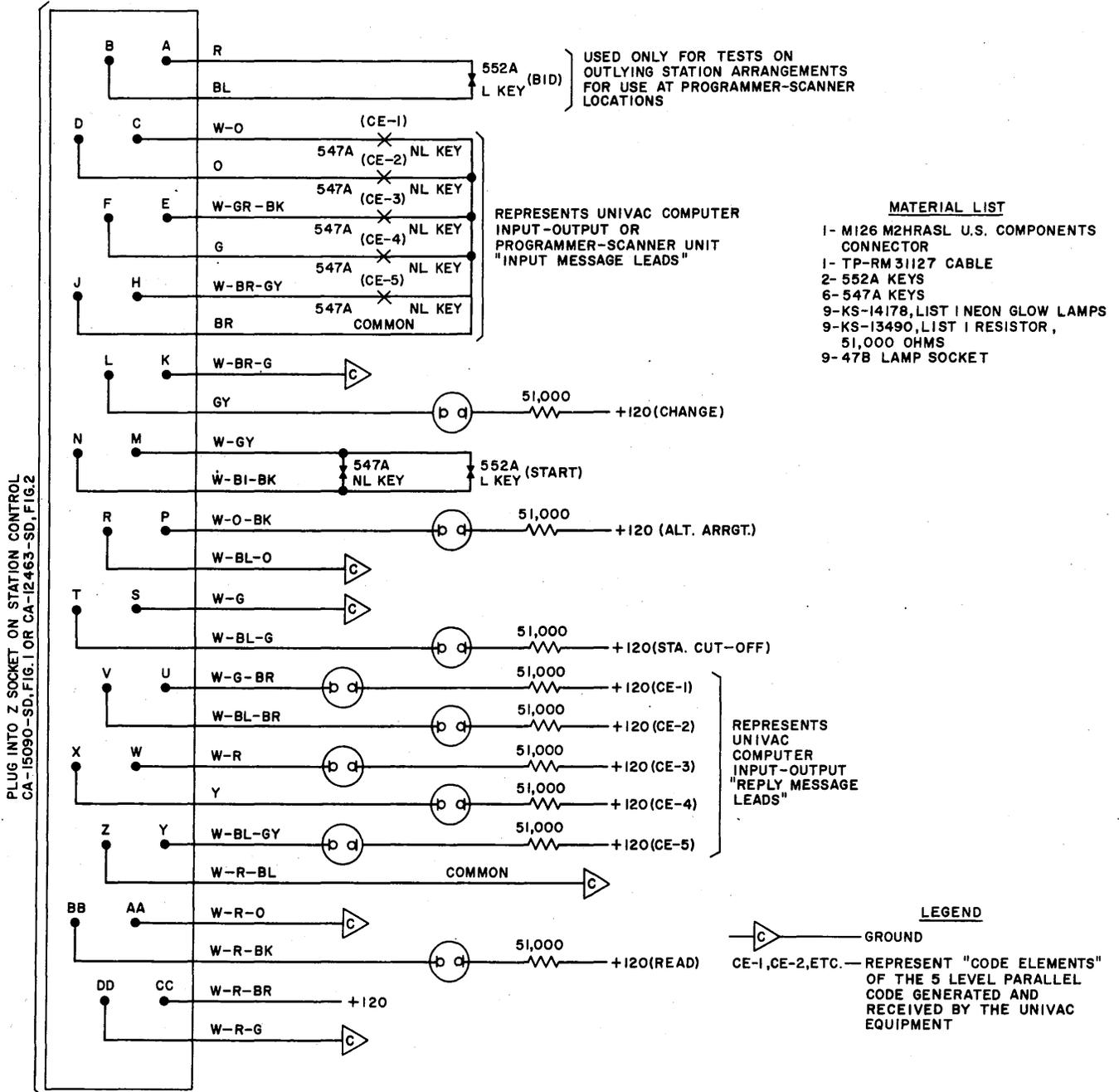
\*Indicates second character of the Transmitter Start Code (TSC) for the station under test.

The message received on the RO teletypewriter should read:

(Test Message) WPUYBFCHH

**3.09** Using the source of automatic test signals and substituting this type of transmission for the above KSR teletypewriter, measure the transmission from the test loop using a portable telegraph transmission measuring set or equivalent. No excessive transmission impairment should be present in the received signals.

**3.10** Restore the MR key to normal and observe that the STATION CUTOFF lamp in the test set is extinguished.



**Fig. 1 — Test Circuit to Simulate Univac File Computer Input-Output and Programmer-Scanner Units**

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### Test of Inquiry Message Pickup—Traffic Available

- 3.11** Connect the KSR teletypewriter to the leads to be normally connected to the regular loop.
- 3.12** Operate the locking type BID key in the test circuit. Observe that the BID white lamp in the key and lamp cabinet lights steadily.
- 3.13** Transmit HH LTRS from the KSR teletypewriter followed by the two-letter TSC for the station under test and the code E. Observe that the green SEND lamp in the key and lamp cabinet lights steadily, upon transmission of the TSC.
- 3.14** Operate the CE2 and CE4 nonlocking keys in the test circuit and hold them depressed. Operate the locking START key. Observe that the No. 28 distributor starts to send and that the CHANGE, the CE2, and CE4 and READ lamps flash at the rate of about ten flashes per second. Also observe that the CHANGE lamp appears brighter, since it remains lighted for approximately 70 milliseconds of each cycle while the other lamps are lighted for only 30 milliseconds of a cycle. The KSR teletypewriter will copy repeated R characters as long as the CE2 and CE4 keys are held depressed.
- 3.15** In addition to the CE2 and CE4 keys in 3.13, operate and hold depressed the CE1, CE3, and CE5 keys to send a repeated LTRS character. Observe that the CE1 through CE5 lamps now flash at the rate of about ten flashes per second.
- 3.16** Restore the START key to normal and observe that the distributor will stop sending. After the distributor stops, release the CE1 through CE5 keys.
- 3.17** Transmit the code H H sequence from the KSR teletypewriter. Observe that the SEND lamp in the key and lamp cabinet is extinguished by this code.
- 3.18** Restore the BID key to normal and again send H H from the KSR. Observe that the BID lamp is extinguished.

### Test of Inquiry Message "Pickup—No Traffic Available"

- 3.19** No keys should be operated or lamps lighted in the test circuit panel. With the KSR teletypewriter connected to the leads to be normally connected to the regular loop, transmit H H LTRS followed by the two-letter TSC for the station under test. The station equipment should generate a code V which should appear on the KSR teletypewriter. Repeat test five times.

### Test of Alarm Condition While Sending an Inquiry Message

- 3.20** Repeat tests as covered in 3.10 through 3.13.
- 3.21** Release CE2 and CE4 keys. Observe that the CHANGE and READ lamps flash two or three times and are extinguished. The AL alarm lamp in the key and lamp cabinet will light steadily and the buzzer will sound. The STATION CUTOFF lamp in the test circuit will light steadily.
- 3.22** Restore the locking START key in the test circuit to normal and operate the AG key in the key and lamp cabinet to the ACO position. Observe that the buzzer is silenced and that the ACO lamp in the key and lamp panel is lighted.
- 3.23** Momentarily operate the nonlocking AR alarm release key in the key and lamp cabinet. Observe that all lamps in the key and lamp cabinet are extinguished except the BID, SEND, and ACO lamps.
- 3.24** Restore the AG key in the key and lamp cabinet to normal. Observe that the ACO lamp is extinguished.
- 3.25** Transmit the code H H sequence from the KSR teletypewriter. Observe that the SEND lamp in the key and lamp cabinet is extinguished.
- 3.26** Restore the BID key to normal and again send H H from the KSR. Observe that the BID lamp is extinguished.

**Test of Alternate Arrangement Feature**

**3.27** Depress CE1, CE2, and START keys in that order until AA has been transmitted and observe that the ALT ARRGT lamp lights. Release START, CE1, and CE2 keys. Depress CE3, CE5, and START keys in that order until H H has been transmitted and observe that the ALT ARRGT lamp is extinguished. Release keys.

**4. ASSEMBLY TESTS, MODIFIED 83B1 CONTROL UNITS**

**4.01** *The following tests on the modified 83B1 control station equipment units which are to be used in conjunction with the Univac-output units at the file computer location shall be made at the point of assembly, prior to the shipment of the equipment to the field for installation.* Drawing CA-12463-SD covers the wiring and interconnecting arrangements for the various equipment units.

**4.02** The modified 83B1 control station equipment units shall be assembled and interconnected as shown in drawing CA-12463-SD, Fig. 6. Connections to the ac service leads shall then be made and the rectifiers adjusted in accordance with standard instructions to furnish negative 48-volt and positive 130-volt outputs "no-load" conditions. Since the key and lamp cabinet which is connected to the control circuitry by means of separable connectors will not be mounted on a teletypewriter table, as is done on a standard 83B1 control station assembly, this unit shall be set in a convenient location where it will be accessible during the tests. Connect the leads from the key and lamp cabinet shown as connecting to the 63C1 loop switchboard into two local .060-ampere dummy circuits. Provide a receiving only and a keyboard sending and receiving teletypewriter arranged for the same speed of operation as the system under test and also arranged so that they can be connected into the dummy circuits. Also provide a source of automatic test signals such as from a station type transmitter-distributor and a suitable test tape containing miscellaneous test signals. The test tape, however, must not contain FIGS or BLANKS.

**4.03** A locally constructed test circuit arrangement consisting of keys and lamps as shown in Fig.1 or its equivalent, shall be provided to simulate the customer provided Univac input-output equipment. The procedures for testing the equipment at the Western distributing houses as outlined in the following are based upon the use of this circuit arrangement.

**4.04** Care should be taken that the 28A sequence selector stuntbox is arranged in accordance with Table A of drawing CA-12463-SD and that the unit satisfactorily meets the bias tolerance tests as outlined in standard instructions.

**4.05** Connect the test circuit discussed in 4.03 to the modified 83B1 control station unit under test by plugging it into the Z connector of the applique circuit per Fig. 2, drawing CA-12463-SD. Proceed as follows.

**Test of Serial to Parallel and Parallel to Serial Conversion**

**4.06** Operate the MR key in the key and lamp cabinet to the MON position. (The MON position of the MR key in the standard 83B1 system is used for monitoring purposes. This key in the modified system is used as a test key to disconnect the modified 83B1 control station equipment from the Univac input-output equipment and to connect it to the test loop for testing the serial to parallel conversion feature.) The STATION CUTOFF lamp in the test set should light.

**4.07** Connect the KSR teletypewriter to the .060-ampere dummy circuit terminating the leads to be normally connected to the regular loop. Connect the RO teletypewriter in the dummy circuit terminating the leads to be normally connected to the test loop. Send the following test message from the KSR machine.

<≡ (Test Message) WPUYBFCHH

The message received on the RO machine should read:

(Test Message) WPUYBFCHH

**4.08** Using the source of automatic test signals and substituting this type of transmission for the above KSR teletypewriter, measure the

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transmission from the test loop using a portable telegraph transmission measuring set or equivalent. No excessive transmission impairment should be present in the received signals.

**4.09** Restore the MR key to normal and observe that the STATION CUTOFF lamp in the test set is extinguished.

### Test of Transmitter Start Circuit—Polling Functions

**4.10** Connect the KSR teletypewriter to the leads to be normally connected to the regular loop.

**4.11** In the key and lamp cabinet, operate the skip SK keys of all unassigned stations as well as the keys in positions 3 and 12 to the SKIP position.

**4.12** The BID key in the test circuit should remain operated at all times during the tests. The BID lamp in the key and lamp cabinet will remain lighted as long as the BID key in the test circuit is operated. This lamp serves only to indicate that the modified 83B1 control station unit is in operation and the power has been turned on.

**4.13** Operate the VS key in key and lamp cabinet to its normal position. With the dummy circuit closed and idle the TSC will after a period of about 15 seconds send the FIGS H H LTRS sequence to the line followed by the assigned TSC for the first station in the polling sequence. These characters and functions will be received on the KSR teletypewriter.

**4.14** Immediately following each TSC in the polling sequence, send a V from the KSR machine. The V must be sent within 2 seconds of the transmission of the start code to avoid "time out" of the start circuit. (This represents a V character which will normally be generated by the outlying station equipment to indicate that no traffic is available for transmission.) Immediately upon transmission of the V, polling will resume to the next station in the polling sequence. The STATION lamps in the key and lamp cabinet will light as each station is polled and will be extinguished upon receipt of the code V character. Repeat this test for at least three polling cycles. Check the teletype-

writer copy to make certain all TSCs codes have been sent.

**4.15** Repeat test in 4.14 except omit transmission of the code V from the KSR machine. This will result in the TSC for each station in the polling sequence being transmitted with a 2- to 4-second pause between stations polled. The ALT lamp will light and the buzzer will operate continuously. At the end of the first polling cycle and after the transmission of the first TSC in the next polling cycle, send a V character from the KSR machine. This will extinguish the ALT lamp in the key and lamp cabinet and silence the buzzer. Within 2 seconds after the transmission of the second TSC in this cycle, send character E followed by five LTRS characters. Within 10 to 15 seconds after the transmission of the last LTRS character an alarm condition will result, the AL and ALT lamps will light and the buzzer will sound. Operate the VS key in the key and lamp cabinet to the stop polling SP position. Operate the AG key in the key and lamp cabinet to the ACO position. The ACO lamp should light and the buzzer should be silenced. Restore the alarm by momentarily operating the AR key. Restore the V key to the normal position. Observe that the polling as discussed in 4.14 will be resumed.

**4.16** Repeat test in 4.14 and omit the code V character for one particular station TSC. Repeat this polling test at least three times and note that when this particular station is polled, the ALT lamp will light and the buzzer will sound momentarily. Continuing this test for another cycle with the VS key in the key and lamp cabinet operated to the V test VTST position, observe that polling will stop and that the ALT lamp will light and the buzzer will sound continuously.

**4.17** Operate the VS key in the key and lamp cabinet to the SP position. Send the following sequence from the KSR machine.

HHQE < ≡

The CE1 lamp and the READ lamp in the test circuit will light in response to the character E. The corresponding CE lamps for the < (CE4) and the ≡ (CE2) along with the READ lamp will light when these characters are sent.

**4.18** Operate the CE2 and CE4 nonlocking keys in the test circuit and hold them depressed. Operate the LOCKING START key. Observe that the No. 28 distributor starts to send and that the CHANGE, CE2, and CE4, and READ lamps flash at the rate of about ten flashes per second. Also observe that the CHANGE lamp appears brighter, since it remains lighted for approximately 70 milliseconds of each cycle while the other lamps are lighted for only 30 milliseconds of a cycle. The KSR teletypewriter will copy repeated R characters as long as the CE2 and CE4 keys are held depressed.

**4.19** In addition to the CE2 and CE4 keys, operate and hold depressed the CE1, CE3, and CE5 keys to send a repeated Letters character. Observe that the CE1 through CE5 lamps now flash at the rate of about ten flashes per second.

**4.20** Restore the START key to normal and observe that the No. 28 distributor will stop sending. After the distributor stops, release the CE1 through CE5 keys.

**4.21** Transmit the code H H sequence from the KSR teletypewriter.

## 5. INSTALLATION TESTS—OUTLYING STATION

**5.01** *The following outlines the procedures to be followed in testing the outlying station equipment units at the Univac programmer-scanner locations at the time of installation and prior to testing the system over-all after its interconnection with the Univac equipment.*

**5.02** The outlying station equipment shall be assembled and interconnected in accordance with drawing CA-15090-SD, Fig. 3 with the 63C1 loop switchboard and the key and lamp cabinet installed in a location convenient to the customer's operating personnel. The demarcation strip Z separable connector arrangement shown in this figure should not be interconnected at this time with the customer provided Univac equipment. Connection to the ac service leads should then be made and the rectifier adjusted in accordance with standard instructions to furnish a positive 130-volt output under "no-load" conditions.

**5.03** The regular and test loops to the STTC shall be lined up in accordance with standard instructions for the required speed of teletypewriter operation using standard telegraph testing apparatus, such as the 100A test set and a portable telegraph transmission measuring set. Since there will normally be no keyboard teletypewriter sets furnished at the Univac programmer-scanner locations, it will be necessary to use other means in communicating with the STTC telegraph test center personnel in conducting these tests.

**5.04** A keyboard monitoring teletypewriter will be needed at the STTC basically for sending the TSC over the regular loop for the station under test. A receiving only monitoring teletypewriter will also be required at the STTC for connection to the test loop.

**5.05** In order to determine the orientation limits of the 28A sequence selector a series of alternate R and Y signals should be sent over the regular loop from the STTC using a tape or other suitable transmitter following standard procedures except that an error will be indicated by the RY indicating slide. The transmission of these characters should be preceded by the sequence H H LTRS \*E (\*Indicates second letter of TSC for the station under test) and followed by the sequence H H. In those cases where alternate RY signals are not available and tests are made using recurring Y signals such as may be obtained from a 100A test distributor, it should be recognized that this is a less severe test than that obtained with the alternate RY signals. The 1A teletypewriter test set where available can be used as a source of alternate R and Y signals by equipping it with the TP-122391 set of parts per Teletype Corporation Specification 5679S.

**5.06** In order to determine whether transmission from the distributor is satisfactory, operate the outlying station key and lamp cabinet to the MON position. This will connect the test loop provided between the STTC and the substation to the serial side of the distributor and interconnect the parallel side of the sequence selector and the distributor through coding relays. Test signals as discussed below may therefore be sent from the STTC over the regular loop and the returning signals sent by the dis-

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tributor may be read at the serving telegraph testroom by connecting the transmission measuring set to the test loop. The test signals thus will be converted from serial to parallel and reconverted back from parallel to serial for transmission over the test loop. Test signals either transmitted by the keyboard monitoring teletypewriter or a station type transmitter-distributor may be used in determining the quality of transmission from the distributor.

**5.07** The following test message format should be used either in sending from the keyboard monitoring teletypewriter or by automatic means: HH\*E<≡ (Test message containing miscellaneous test material and characters, or "fox" and H H). \*Represents the second character of the TSC for the station under test. The receiving only monitor connected to the test loop should read:

<≡ (Test message as sent) HH

**5.08** Restore the MR key in the key and lamp cabinet to its normal position.

**5.09** The code V generator in the outlying station control equipment should be within the limits given hereafter when measured as indicated. In the operation of the airlines reservations system, the code V signal occurs when it is tripped off by the TSC, with no bid having been placed on the 83B1 equipment by an agent set. It is therefore necessary that the distortion of the V signals be measured when they are produced in the normal manner i.e., following the TSC and that the process of adjusting the distortion be one of reducing the distortion caused by it to the point where it does not add to the distortion of the associated tripping TSC.

**5.10** The distortion of the source of the TSC should be low enough that it does not mask the effect of the V signal. Therefore, the distortion of the TSC should be measured at the substation as covered in standard procedures using a portable telegraph transmission measuring set. It is contemplated that the code V signal be measured in response to TSC transmitted by a keyboard monitoring teletypewriter. The allowable distortion from the keyboard set itself is 8 per cent. The actual distortion read should be recorded for subsequent use.

**5.11** The V generator should be tested by sending the TSC for the station under test from the keyboard monitoring teletypewriter as follows. HHQ\* (\*Represents the second character of the TSC for the station under test.) The distortion in the resulting combination of the TSC signal should be measured as covered in standard procedures using a portable telegraph transmission measuring set. This distortion should then be adjusted by manipulating the potentiometers on the panel of the station control circuit until it is no greater than that measured in 5.10 for the source of the TSC. During this adjustment it is important that the printed copy of the V on the keyboard monitor in the STTC be observed to make certain no character other than V is printed. Under no circumstances should the V generator be adjusted by holding open the 28A sequence selector contacts to send continuous Vs.

**5.12** In the outlying station control circuit, block the V relay operated. Observe that the white BID lamp in the key and lamp cabinet lights steadily. Proceed with the following test sequence.

- (a) Transmit H H LTRS from the keyboard monitoring teletypewriter in the STTC followed by the two letter TSC for the station under test and the STC code E. Observe that the green SEND lamp in the key and lamp cabinet lights steadily.
- (b) Transmit a BREAK signal from the keyboard monitoring teletypewriter in the STTC. Observe that the red AL lamp in the key and lamp cabinet lights steadily and that the buzzer sounds.
- (c) Operate the locking AG key in the key and lamp cabinet to the ACO position. Observe that the buzzer is silenced and that the white ACO lamp is lighted.
- (d) Momentarily operate the nonlocking AR key in the key and lamp cabinet. Observe that all lamps are now extinguished except the BID, SEND, and ACO lamps.
- (e) Restore the AG key in the key and lamp cabinet to normal. Observe that the ACO lamp is extinguished.

(f) Transmit the H H sequence from the keyboard monitor. Observe that the SEND lamp is extinguished.

(g) Unblock the V relay in the control circuit. Observe that the BID lamp is extinguished.

## 6. INSTALLATION TESTS—MODIFIED 83B1 CONTROL UNITS

**6.01** *The following outlines the procedures to be followed in testing the modified 83B1 control station equipment at the Univac file computer input-output unit locations at the time of installation and prior to testing the system over-all after its interconnection with the Univac equipment.*

**6.02** The spare modified 83B1 control station equipment shall be assembled and interconnected in accordance with drawing CA-12463-SD, Fig. 6 with the 63C1 loop switchboard, the key and lamp cabinet and the 6028C transfer key installed in a location convenient to the customer's operating personnel. The demarcation strip ZA1 through ZA4 separable connector arrangements shown in Fig. 6 should not be interconnected at this time with the customer provided Univac input-output units. The separable connectors Z1 through Z4 from the regular modified 83B1 control station units as provided should be interconnected with the transfer unit in the spare control station cabinet. Connection to the ac service leads should then be made for all regular and spare modified 83B1 control station units provided and the rectifiers adjusted in accordance with standard instructions to furnish a positive 130-volt and a negative 48-volt output under "no-load" conditions.

**6.03** The 6028C transfer key should be operated so that the spare modified 83B1 control station unit is not substituted for any of the regular units provided. All regular units provided should be tested in accordance with the procedures outlined in the following prior to testing the spare unit.

**6.04** The regular and test loops to the STTC shall be lined up in accordance with standard instructions for the required speed of tele-

typewriter operation using standard telegraph testing apparatus such as the 100A test set and a portable telegraph transmission measuring set. Since there may be cases where no keyboard, teletypewriter set is furnished at the Univac file computer location, it will be necessary to use other means in communicating with the STTC personnel in conducting these tests.

**6.05** A keyboard sending and receiving only monitoring teletypewriter will be required at the STTC basically for use in testing the serial to parallel and parallel to serial conversion arrangement in the modified 83B1 control station equipment. These sets would be connected to the regular and test loops to the substation. At some Univac computer locations, a keyboard teletypewriter or a keyboard typing reperforator may be provided for monitoring purposes and emergency communications with the programmer-scanner locations. At such locations this machine may be used to monitor the circuit during the test along with the monitor at the STTC. It may also be used for communicating with the STTC during the tests.

**6.06** In order to test the sequence selector and the distributor as well as the serial to parallel and parallel to serial conversion, proceed as outlined in 5.05 through 5.09.

### Test of Transmitter Start Polling Functions

**6.07** At the STTC connect a keyboard monitoring teletypewriter to the circuit.

**6.08** In the key and lamp panel associated with the modified control station equipment operate the skip SK keys of all unassigned stations including those in positions 3 and 12 to the SKIP position. The MR and AG keys should be in their normal positions and the VS key operated to the SP positions.

**6.09** Operate the VS key in the key and lamp cabinet to its normal position. With the circuit to the STTC closed and idle, the transmitter start circuit will after a period of about

10 or 15 seconds send the FIGS H H LTRS sequence followed by the TSC for the first station in the polling cycle. These functions and characters will be received on the keyboard monitoring teletypewriter at the STTC.

**6.10** Immediately following each TSC in the polling cycle, send a V from the keyboard monitor. The V must be sent within 2 seconds of the transmission of the start code to avoid "time out" of the start circuit. (This represents a V character which will normally be generated by the outlying station equipment to indicate that no traffic is available for transmission.) Immediately upon transmission of the V polling will resume to the next station in the polling cycle. The station lamps in the key and lamp cabinet will light as each station is polled and will be extinguished upon receipt of the code V character. Repeat this test for a least three polling cycles. Check the monitoring teletypewriter copy to make certain all TSC have been set except for those stations on SKIP.

**6.11** Repeat test in 6.10 except omit the transmission of the code V from the keyboard monitor. This will result in the TSC for each station in the polling cycle being transmitted with a 2- to 4-second pause between stations polled. The ALT lamp will light and the buzzer will operate continuously. At the end of the polling cycle, send a V character from the keyboard monitor after the transmission of the first TSC in the next polling cycle. This will extinguish the ALT lamp in the key and lamp cabinet and silence the buzzer. Within 2 seconds after the transmission of the second TSC in this cycle, send the character E followed by five LTRS characters. Within 10 to 15 seconds after the transmission of the last LTRS character, an alarm condition will result with the lighting of the AL and the ALT lamps and with the buzzer sounding. Operate the VS key in the key and lamp cabinet to the stop polling SP position. Operate the AG key in the key and lamp cabinet to the ACO position. The ACO lamp should light and the buzzer should be silenced. Restore the alarm by momentarily operating the AR key. Restore the V key to the normal position. Observe that the polling as discussed in 6.10 will be resumed.

**6.12** Repeat test in 6.10 and omit the code V response character for one particular station TSC. Repeat this polling test at least three times and note that when this particular station is polled, the ALT lamp will light and the buzzer will sound momentarily. Continuing this test for another cycle with the VS key in the key and lamp cabinet operated to the V test VTST position, observe that polling will stop and that the ALT lamp will light and the buzzer will sound continuously.

## **7. CIRCUIT OPERATING TESTS, OVER-ALL SYSTEM TESTS USING UNIVAC EQUIPMENT**

**7.01** The control and outlying station equipment shall have been previously tested individually as covered in Parts 5 and 6 and any troubles indicated shall have been located and cleared before proceeding with the overall system tests.

**7.02** All unassigned stations shall be placed on "skip" by the operation of the appropriate SKIP key in the key and lamp cabinet at the control station. All the outlying stations shall be placed on the circuit with the control station and polling initiated by the operation of the VS key to the normal position at the control station. After the initial alarm condition has been released, observe that each outlying station is polled and that a code V is received from each station.

*Caution: If the customer provided Univac equipment has been connected to the station at the demarcation point, all agents sets shall have been cleared of any transaction to prevent placing a bid for the circuit during the period for checking the code V.*

**7.03** A standard test transmission is recommended whereby the customer at the request of the Telephone Company can enter a transaction at any agents set which will result in the transmission of a predetermined sequence of characters that can be identified at the testroom for the sectionalizing and location of trouble. A typical test transmission will consist of a computer input message from an outlying station agents set and a computer reply message from the control station. This standard test transmission should appear on a monitor as follows.

Input Message	Reply
EWUGJBYCPM T TTTTWPT	

Where

E = Start-of-Message

W = Transaction

UGJ = Slide Identification of Test Slide

B = Destination

Y = Number of Seats

C = Month

PM = Day

Space = Origin

T = End of Input Message

TTTTWPT = Reject (reply from  
computer)

**7.04** After the tests under 7.02 have been completed and all troubles cleared, joint tests with the customer can be undertaken. The customer provided Univac equipment must now be connected to control and outlying stations under test at the appropriate demarcation points. The customer should now be able to communicate with the computer from the agents sets. Should the customer fail to receive a valid reply from the transaction or inquiry initiated it is suggested that the standard test transmission be used and monitored at the testrooms to determine the progress it makes when the station is next polled. Observation of the BID and SEND lamps in the station key and lamp cabinet should indicate whether or not the station is responding to its TSC properly. Observation of the testroom monitors should indicate the progress of the standard test transmission and indicate the location or section in which the failure occurs.

## 8. REFERENCES

**8.01** The following are Bell System Practices, drawings, CD sheets related to this section.

AA286.040 — 83B1 Selective Calling System — Engineering Considerations

AA286.919 — Selective Calling System for Airlines Reservations System using Remington Rand Univac File Computer

E12.775 — Office Responsibilities, Operating and Testing Procedures for Circuits Associated with the Modified 83B1 Selective Calling System for Airlines Reservations Using Remington Rand Univac Equipment

E12.776 — Office Responsibilities, Operating and Testing Procedures for Circuits Associated with 83B1 Teletypewriter Selective Calling System

P65.200 — 83B1 Selective Calling System — Operating Tests

P70.036 — 83B1 Selective Calling System — Description and Operating Principles

P70.037 — 28A Sequence Selector and No. 28 Distributor — Description and Operating Principles

581-100-902 LL — Modified 83B1 Selective Calling System for Airlines Reservations Using Remington Rand Univac Equipment — Description and Operating Principles

CA-12463-SD, ED, T — 83B1 Modified Selective Calling System for Airlines Reservations System — Control Station at Univac File Computer Location

CA-15090-SD, ED — Selective Calling System for Airlines Reservations System — Outlying Station at Programmer-Scanner Locations

SD-70831-01 — 83B1 Transmitter Start Circuit  
CD-70831-01

SD-70832-01 — 83B1 Station Control Circuit