82B1 SWITCHING SYSTEMS

OUTLYING STATIONS

ROUTINE MAINTENANCE PROCEDURES

CONTENTS PAGE

1. GENERAL

1.01 This section outlines a suggested routine maintenance procedures for outlying stations on 82B1 switching systems. It is assumed that, under normal conditions, all station equipment will be serviced on one visit. However, in the event that only selected units of equipment are to be serviced, careful reference to the paragraph involved, and to related paragraphs will indicate an acceptable method of procedure.

1.02 Reference should be made to the "Maintenance Inspection and Tests" sections for detailed procedures applicable to the particular apparatus involved. Troubles following maintenance visits have been noted, in some cases to be due to the methods of carrying out the maintenance work. The maintenance instructions have been arranged with the view of avoiding such troubles and it is therefore important that the Practices be very carefully followed.

1.03 The sequence of work has been arranged to minimize interruptions to customer traffic, consistent with satisfactory maintenance. Customer traffic may be handled at certain times during the inspection, as the station is not skipped and/or intercepted during the entire maintenance interval.

1.04 Requests and arrangements for releasing and skipping are normally made in maintenance messages sent by the local customer directly to a supervisory position at the switching center. This method is used to reduce out-of-service time and to save time of the testroom maintenance forces. This procedure, however, does not in any way eliminate the responsibility of the person performing the maintenance work from keeping the serving testroom informed of all operations that might, in any way, interfere with service to other stations on the circuit.

1.05 During the course of maintenance operations, if the maintenance man feels he is being unduly delayed in receiving a confirmation of a request for action by the switching center, he should request assistance from the serving testroom.

1.06 Requests for release from a skip condition will, of necessity, be made through the serving testroom for the outlying station involved.

2. RELEASING, SKIPPING, AND INTERCEPTING

Releases for Routine Maintenance

2.01 A majority of the stations on an 82B1 system operate on a 24 hour basis; therefore, every effort should be made to cooperate with the local customer regarding all forms of releases.

2.02 Routine maintenance release arrangements should be made with the local customer in advance of the inspection period desired. Appointments should be made by calling the local customer, who will advise if the period selected is satisfactory after checking with the switching center. If the time proposed is not agreeable, the customer will suggest other periods which may be available.

Intercepting

2.03 Requests for intercepting should be made through the Servicing Testroom. They will contact the Control Office to arrange for the action requested. Do not proceed with the work until assured that the request has been complied with. Where the work to be done might, in any way, interfere with traffic to any of the other stations on a multistation line, the Serving Testroom shall be so advised. They will then arrange to remove the receive side of the station involved from the circuit in a manner that will not cause an interruption to service.

2.04 Stations should be released from intercept in a similar manner. The release will be acknowledged by the switching center.

Skipping

2.05 Requests for skipping should be made of the local customer, and an estimate given as to the length of time the station is to remain on SKIP. The customer will send a maintenance message to the Switching Center requesting this action and stating the reason for the request. A few "bells" inserted in this message will usually assure prompter action. Do not proceed with the work until the request is acknowledged by the switching center. Where the work to be done might, in any way, interfere with traffic from any other station on a multistation line, the serving testroom shall be so advised. They will then arrange to remove the sending side of the station involved from the circuit in a manner that will not cause an interruption to service.

2.06 When the work which has required skipping has been completed, remove any tape from the AUX transmitter and verify that the pivoted head of the REG transmitter is against the punch block. Request the serving testroom to restore the station involved to the regular circuit, and to advise the switching center to release the station from SKIP. The customer should prepare a channel check message to be picked up on the first poll following release from the skip condition. Do not allow "live" traffic to be sent before this message has been transmitted and received back at the station. Receipt of this message by the originating station is verification of the release from SKIP and the proper functioning of the transmitting and receiving equipment involved.

3. PROCEDURES, MULTISTATION LINES

The decision as to the equipment to be routined first shall rest with the local customer, who will be governed by conditions existing at the time of arrival of the teletypewriter repairman. If the send side is to be released first, follow the procedures outlined in 3.01, followed by 3.02 and/or 3.03, as applicable. If the receive side is to be released first, start with 3.01(a) then proceed with either 3.02 or 3.03(b), as applicable. Return to 3.01(b) and complete remaining items of 3.01. In either case it will be necessary to complete the routine by applying the procedures outlined in 3.04. (See Charts 1 and 2.)

Station Consisting of Electronic Director, Station Control Circuit, 28ASR-2, 28RO, and 28ROTR

3.01 After obtaining permission from the customer to start with the routine on the Sending Equipment, the following procedure will be used.

(a) If required by local practices, notify the serving testroom that the routine work is being started.

(b) Remove and routine the typing unit of the 28ASR-2.

Caution: During the minute or two that the power switch is turned off on the ASR-2 the SWC will not receive an "H" answer-back to a poll and an alarm condition will exist. Verify that the send side is in the "quiet" condition or request the SWC to skip the station for the minute it will take to remove the typing unit. Turn the power switch back on as soon as the unit has been removed.

(1) Customer is able to prepare and transmit tapes to the line during this period. However, it will not be possible to obtain a hard copy of these messages as they will be

transmitted "blind". For future reference, customer should write the message number on the tape or operate the SOM-NBR switch to MAN and perforate the start-of-message and number sequence ahead of the message routing indicators.

(2) All control panel switches are in the NORMAL position unless the customer has, for the above or for some other reason, positioned one or more otherwise.

(c) Upon completion of (b), obtain a release from the customer on the sending side of the circuit and request that a message be transmitted to the Switching Center requesting that the station be placed on SKIP for the length of time that it is estimated it will take to complete the routine on the remainder of the 28ASR-2. Do not proceed with the work until a message is received from the Switching Center advising that the station is on SKIP. The customer will, under normal circumstances, transmit any prepared tapes before sending the skip request.

(d) Observe, and make a note of the position of the message number selectors and all option switches, especially the SOM-NBR switch.

(e) Operate the LOCAL TEST switch to the ASR position (send line is shorted, receiving functions are normal). The DC POWER (Red) lamp will light and the AUD-ALM (Buzzer) will operate; operation of the BUZZER key will silence the audible alarm but the lamp will remain lighted until the switch is returned to the NORMAL position.

(f) Complete the routine on the remainder of the 28ASR-2.

(g) Upon completion of (f), prepare and transmit test messages from both the REG (Pivoted Head) and AUX (Hard Gate) transmitters using the format shown in Item II (b) of Table 1, Section P66.030. Observe that, (1) the start-of-message and number sequence precede the prepared tape, (2) the last character, other than LTRS, perforated is transmitted, and (3) that the LTRS-DISCARD feature is operating properly.

(1) With the LOCAL TEST switch in the ASR position, the transmitters can be started only by operation of the MAN XMTR START key.

(h) Restore message number selectors and option switches to the positions noted in (d). Remove any tape from the AUX transmitter and make certain that the pivoted head of the REG transmitter is against the punch block.

(i) Restore the LOCAL TEST switch to NORMAL.

(j) Request the serving testroom to restore the station to the circuit, if it has been removed and to arrange for the Switching Center to release the SKIP condition.

(k) Request customer to prepare a channel check message for transmittal on the first poll following release from the SKIP condition. Do not allow "live" traffic to be transmitted before this message has been received back at the station.

3.02 The following procedure should be used to routine the Receiving Equipment.

(a) Obtain permission from the customer to proceed with the routine on the Receiving Equipment.

At certain locations, where a hard copy and a tape are not required on each incoming message, the customer will release the RO and the ROTR separately. In these cases the following procedure will be used, otherwise use procedure following 3.02(g).

(b) Turn off the power to the ROTR.

(c) Routine the complete ROTR.

(d) Upon completion of the routine, turn on the power and monitor at least one message on the ROTR, and if copy is satisfactory proceed with (e).

(e) Turn off the power to the Receiving Only (RO) unit.

(f) Routine the complete RO.

(g) Upon completion of the routine, turn the power on and observe at least one complete message.

Caution: At locations where a hard copy and a tape are required for each message the station must be placed on intercept during this portion of the routine. In these cases proceed as follows.

(h) Request the Serving Testroom to arrange for the station to be placed on INTERCEPT. Do not proceed with the work until advised that this request has been complied with.

(i) Routine the complete ROTR.

(j) Routine the complete RO.

(k) Upon completion of these routines, advise the Serving Testroom that the routine inspection of all units has been completed and that you are ready to proceed with the tests as outlined in 3.04.

Stations Consisting of Electronic Director, Station Control Circuit, 28ASR-2, and 28RO

3.03 Routine of Station Equipment should be performed using the following procedure.

(a) Complete 3.01(a) through (k).

(b) Obtain permission from the customer to proceed with the routine of the receiving teletypewriter (28RO).

(c) If a message is not being received, operate the TYPING UNITS switch to the INTCHGD (Interchanged) position. If a message is being received, operate this switch immediately following receipt of LF NNNN. Incoming messages will be received on the typing unit of the sending set in page form. Transmission to the line will be "Blind".

(d) Routine complete receiving teletypewriter (28RO).

(e) Upon completion of (d), operate the TYPING UNITS switch to NORMAL if a message is not being received; if a message is being received, perform this operation immediately after receipt of the End-Of-Message (EOM) code LF NNNN.

3.04 Testing of Station Equipment should be accomplished by using the following procedure.

(a) Request the Serving Testroom to have the station placed on SKIP (and on INTERCEPT, if it is not already intercepted) for the length of time it is estimated it will take to complete the required tests.

(b) Do not proceed with the tests until advised that the station is on SKIP and INTERCEPT.

The station is now out-of-service and a concerted effort shall be made to complete all tests in as short a time as possible consistent with proper station maintenance.

(c) Operate the LOCAL TEST switch to COMPL STA (Complete Station) position. Send and receive loop are both shorted, relays ASR and REC are operated in a local dummy circuit from the KBD signal generator contacts or the distributor contacts.

If replacement, adjustment, or tests of the electronic director or units of the station control circuit are required, they shall be made at this time using Section P66.030 as a guide.

(d) Make necessary local tests as required to verify operation of both the transmitting and receiving elements of the station. Table 1, Section P66.030 covers typical local test procedures. (See 3.01(g).)

(e) Call the Serving Testroom and complete the required routine maintenance receiving and transmitting tests.

(f) Verify that all message number selectors and option switches are in the position noted in 3.01(d).

(g) Request testroom to notify the Switching Center to remove station from "SKIP and INTERCEPT".

(h) Request customer to prepare a "Channel Check" message for transmission on the first poll after release from "SKIP and INTERCEPT". Do not allow "live" traffic to be transmitted before this message is received back at the station.

(i) Do not leave the station until at least two messages have been received and two messages transmitted. If traffic is light, customer "Channel Check" messages as described in (h) will suffice.

4. PROCEDURES, SINGLE STATION LINES

The decision as to the equipment to be routined first shall rest with the local customer, who will be governed by conditions existing at the time of arrival of the teletypewriter repairman. If the send side is to be released first, follow the procedures outlined in 4.01 through 4.02(g) or 4.03(d), as applicable. If the receive side is to be released first, start with item 4.01(a) then advance to 4.02(a), or 4.03(a), as applicable. Return to 4.01(b) and complete remaining items of 4.01. In either case, it will be necessary to complete the routine by applying the procedures outlined in 4.04. (See Charts 3 and 4.)

Caution: On single station lines, the receiving sets are connected to the receive side of the circuit at all times and outgoing traffic originates whenever tape is inserted in the gate of the AUX transmitter or a message is "COUNTED-IN on the REG transmitter.

Stations Consisting of Station Control Circuit, 28ASR-2, 28RO, and 28ROTR

4.01 After obtaining permission from the customer to start with the routine on the Sending Equipment, the following procedure will be used.

(a) If required by local practice, notify the Serving Testroom that the routine work is being started.

(b) Remove and routine the typing unit of the 28ASR-2. Customer is able to prepare tapes and transmit them to the line during this period. However, it will not be possible to obtain a hard copy of these messages as they will be transmitted to the line "blind". For future reference the customer should write the message number on the tapes transmitted during this period or operate the SOM-NBR switch to MAN and perforate the start-of-message and number sequence ahead of the routing indicators in the tape.

(1) All control panel switches are in the NORMAL position, unless the customer has, for the above or some other reason positioned one or more otherwise.

(c) Upon completion of (b), obtain a release from the customer on the sending side of the circuit and request that a message be transmitted to the Switching Center advising them that the transmitting side of the circuit will be inoperative for the length of time estimated to routine the remainder of the 28ASR-2. The customer will under normal circumstances, transmit any prepared tapes before granting this request.

(d) Observe and make a note of the position of the message number selectors and all option switches, especially the SOM-NBR switch.

(e) Operate the LOCAL TEST switch to the LOCAL TEST position. This applies a short to the send line; receiving functions are normal. The DC POWER (Red) lamp will light and the AUD-ALM (Buzzer) will operate; operation of the BUZZER key will silence the audible alarm but the lamp will remain lighted until the switch is returned to the NORMAL position.

(f) Complete the routine on the remainder of the 28ASR-2.

(g) Upon completion of (f), prepare and transmit test messages from both the REG (Pivoted Head) and AUX (Hard Gate) transmitters using the format and test procedures specified in 3.07 through 3.19 of Section P66.031. Observe that, (1) the start-of-message and number sequence precede the prepared tape, (2) the last character, other than LTRS, perforated, is transmitted, and (3) that the LTRS-DISCARD feature is operating properly.

(h) Remove any tape from the AUX transmitter and make certain that the pivoted head of the REG transmitter is against the punch block.

(i) Restore message number selectors and option switches to the position noted in (d).

(j) Request the customer to prepare and transmit a "Channel Check" message. Reception of this message on the receiving unit is a verification of the proper functioning of the transmitting and receiving elements involved.

4.02 The following procedure should be used to routine the Receiving Equipment.

(a) Obtain permission from the customer to proceed with the routine on the Receiving Equipment.

Caution: At certain locations, where a hard copy and a tape are not required on each incoming message, the customer will release the RO and the ROTR separately. In these cases the following procedure will be used, otherwise use procedures following 4.02(g).

(b) Turn off the power to the ROTR.

(c) Routine the complete ROTR.

(d) Upon completion of this routine, turn on the power and monitor at least one message on the ROTR, and if copy is satisfactory proceed with (e).

(e) Turn off the power to the Receiving Only (RO) unit.

(f) Routine the complete RO.

(g) Upon completion of this routine, turn the power on and observe at least one complete message.

Caution: At locations where a hard copy and a tape are required for each message received, the station must be placed on INTERCEPT during this portion of the routine. In these cases proceed as follows.

(h) Request the Serving Testroom to arrange for the station to be placed on INTERCEPT. Do not proceed with the work until advised that this request has complied with.

(i) Routine the complete ROTR.

(j) Routine the complete RO.

(k) Upon completion of these routines, advise the Serving Testroom that the routine inspection of all units has been completed and that you are ready to proceed with the tests as outlined in 4.04.

Stations Consisting of Station Control Circuit, 28ASR-2 and 28RO.

4.03 Routine of Station Equipment should be performed using the following procedure.

(a) Complete 4.01(a) through 4.02(a).

(b) Request the Serving Testroom to arrange for the station to be placed on INTERCEPT. Do not proceed with the work until advised that this request has been complied with.

(c) Routine the complete RO.

(d) Upon completion of this routine, advise the Serving Testroom that the routine inspection of all units has been completed and that you are ready to proceed with the tests as outlined in 4.04.

4.04 Testing of Station Equipment should be accomplished by using the following procedure.

Caution: The station is now out-of-service and a concerted effort shall be made to complete all tests in as short a time as possible consistent with proper station maintenance. If replacement, adjustment, or tests of units of the station control circuit are required, they shall be made at this time using Section P66.031 as a guide.

(a) Make necessary local tests, as required to verify operation of both the transmitting and receiving elements of the station. Section P66.031 covers typical local test procedures.

(b) Call the Serving Testroom and complete the required routine maintenance receiving and transmitting tests.

(c) Verify that all message number selectors and option switches are in position noted in 4.01(d).

(d) Request the Serving Testroom to notify the Switching Center to remove station from "INTERCEPT".

(e) Request customer to prepare and transmit a "Channel Check" message. Receipt of this message back at the station verifies release from the "INTERCEPT" condition and proper operation of the transmitting and receiving equipment involved.

(f) Do not leave station until at least two messages have been received and two messages transmitted. If traffic is light, customer channel check messages as discussed in (e) will suffice.

5. REFERENCES

5.01 The following is a list of Bell System Practices and other material which field maintenance forces and Serving Testrooms may find helpful in maintaining outlying stations on an 82B1 System.

E12.731.0	General – Automatic Teletypewriter Switching Systems – Pre-Service Test Procedures
E12.731.3	U.S. Navy 82B1 – Automatic Teletypewriter Switching Systems – Plant Pre-Service Test Procedures
E12.755.2	United States Navy 82B1 Switching System
P30.002	Teletypewriter Stations – Orientation Test and Distoration Tolerances
P34.500	28 Teletypewriter – Maintenance Inspections and Tests
P34.601	28 Teletypewriter – Lubrication
P66.030	82B1 Switching Systems – Performance Tests – Multistation Lines
P66.031	82B1 Switching Systems – Performance Tests – Single Station Lines
CD, SD 70733-01	82B1 – Control Circuit – Multistation Lines
CD, SD 70747-01	82B1 – Control Circuit – Single Station Lines

CHART 1 — MULTISTATION LINES SENDING SIDE TO BE ROUTINED FIRST

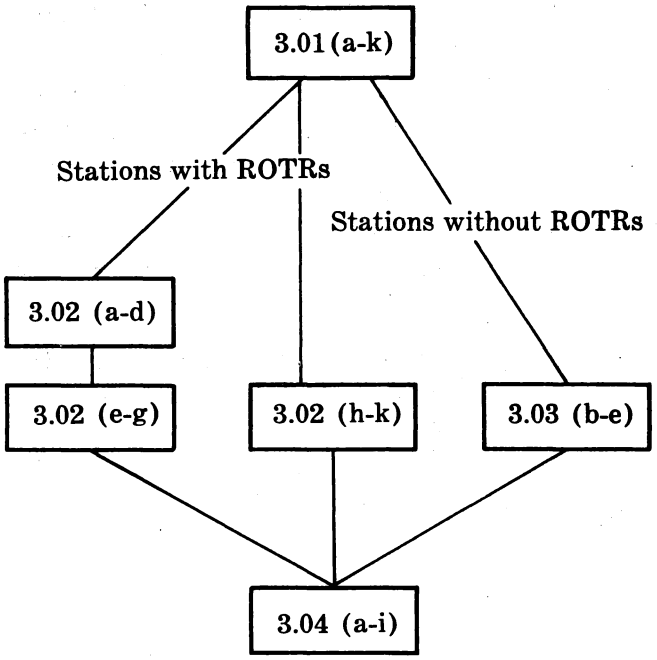


CHART 2 — MULTISTATION LINES RECEIVING SIDE TO BE ROUTINED FIRST

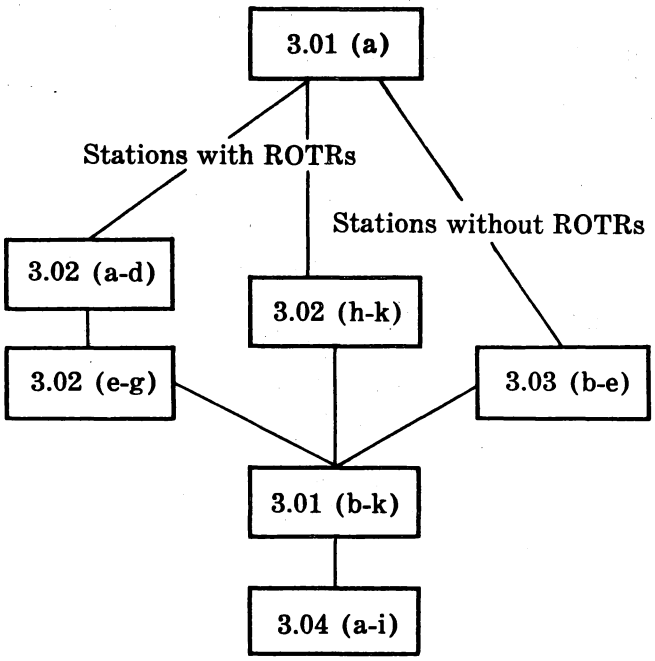


CHART 3 — SINGLE STATION LINES SENDING SIDE TO BE ROUTINED FIRST

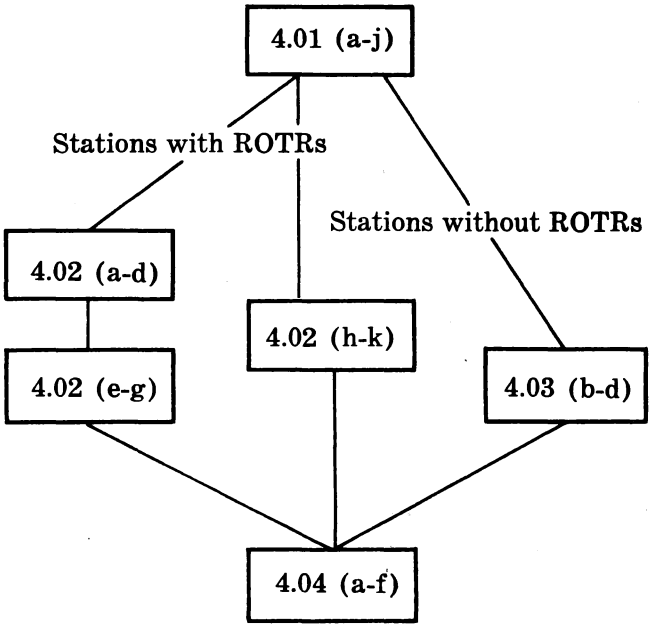
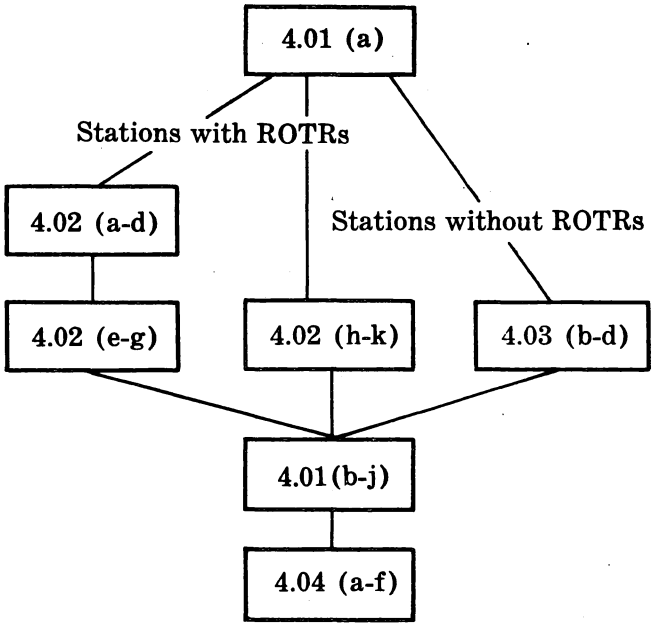


CHART 4 — SINGLE STATION LINES RECEIVING SIDE TO BE ROUTINED FIRST



ROUTINE MAINTENANCE PROCEDURES

ACTION MULTISTATION LINES	RESPONSIBILITY SERVING TESTROOM	TTY REPAIRMAN	LOCAL CSR
1. Initial Release Request.	X		
2. Decision regarding unit to be routined first.			X
3. Notification of Serving Testroom.		X	
4. Routine 28ASR-2 Typing Unit.		X	
5. Request station be put on "SKIP".			X
6. Routine remainder of 28ASR-2.		X	
7. Test Operation of ASR-2 locally.		X	
8. Request release from "SKIP".	X		
9. Send Channel Check Message.			X
10. Request INTERCEPT, if required.	X		
11. Routine ROTR.		X	
12. Routine RO.		X	
13. Request release from Intercept.	X		
14. Request "SKIP" (and "INTERCEPT,"if required).	X		X
15. Routine Station Control Unit, if required.		X	
16. Make routine tests.	X	X	
17. Request release from "SKIP" and "INTERCEPT".	X		
18. Send Channel-Check Message.			X
19. Monitor traffic.		X	

ROUTINE MAINTENANCE PROCEDURES

ACTION SINGLE STATION LINES	RESPONSIBILITY SERVING TESTROOM	TTY REPAIRMAN	LOCAL CSR
1. Initial Release Request.	X		
2. Decision regarding unit to be routined first.			X
3. Notification of Serving Testroom.		X	
4. Routine 28ASR-2 Typing Unit.		X	
5. Obtain release of Send Side.		X	
6. Routine remainder of 28ASR-2.		X	
7. Make local tests on 28 ASR-2.		X	
8. Send Channel Check Message.			X
9. Obtain permission to routine Receive Side.		X	
10. Request INTERCEPT, if required.	X		
11. Routine 28 ROTR.		X	
12. Routine 28 RO.		X	
13. Request station be INTERCEPTED, if not intercepted in 10 above.	X		
14. Routine Control Unit, if required.		X	
15. Make required routine tests.	X	X	
16. Release station from INTERCEPT.	X		X
17. Send Channel-Check Message.			X
18. Monitor traffic.		X	