

TAKING EQUIPMENT OUT OF SERVICE RECORDER AND RECORDER CONNECTOR CIRCUITS NO. 1 CROSSBAR OFFICES ARRANGED FOR AMA

1. GENERAL

1.01 This section covers the method to be followed in taking a recorder and recorder connector circuit out of service in No. 1 crossbar offices arranged for AMA. It also covers the methods of taking out of service the individual pieces of apparatus in these circuits.

1.02 This section is reissued to remove the procedure for splicing perforated tape and to add the procedure for interleaving perforated tape when taking a perforator out of service in central offices.

1.03 Part 3 of this section covers the method of taking the recorder and recorder connector circuit out of service and Part 4 covers the precautions to be followed when working on the apparatus associated with this circuit.

1.04 A regular recorder and recorder connector circuit is associated with a call identity indexer and a maximum of 100 district junctors arranged for AMA service on a particular district junctor frame. One emergency recorder and recorder connector circuit is provided for the marker group and may be substituted for a regular recorder and recorder connector when a regular recorder and recorder connector is to be removed from service. This is accomplished by transferring the call identity indexer and associated district junctor frame to the emergency recorder and recorder connector. If the emergency recorder and recorder connector is not available, then the district junctors arranged for AMA service on the district junctor frame associated with the regular recorder should be made busy provided there will be sufficient district junctors arranged for AMA, left in service to care for traffic. Under either of the above conditions, all completed calls will be charged.

1.05 If it is impracticable to transfer or to make the district junctors busy, the recorder should be made busy. Under this condition all message unit calls using district junctors associated with the recorder made busy will be free calls and all toll calls using

these district junctors will be routed to overflow. For this reason recorders should be made busy only when that is the only means of taking them out of service.

1.06 For the above reasons, when the emergency recorder is in use and it is desired to take it out of service, the associated district junctors should be transferred back to the regular recorder or the associated district junctors should be made busy, whenever possible.

2. APPARATUS

2.01 No. 322A (make busy) Plugs, as required.

2.02 KS-14343 Tape Reader.

2.03 Red China Marking Pencil.

3. METHOD OF TAKING EQUIPMENT OUT OF SERVICE

Regular Recorder and Preference Circuits and All Individual Pieces of Apparatus in These Circuits

3.01 If the emergency recorder is not in service as indicated by the associated EW lamp being extinguished, transfer the associated district junctor frame from the regular recorder to be removed from service to the emergency recorder by inserting a No. 322A plug into the TN- jack associated with the regular recorder at the transverter trouble indicator frame. Observe that the EW lamp associated with the emergency recorder is lighted.

3.02 If the emergency recorder is in service and the transferred regular recorder is not in trouble, determine whether it is satisfactory to restore the transferred regular recorder to service and if so, remove the plug from the associated TN- jack at the transverter trouble indicator frame. Observe that the EW lamp associated with the emergency recorder is extinguished. Then insert the plug into the associated TN- jack of the recorder to be transferred, observe that the EW lamp associated with the emergency recorder is lighted.

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3.03 If the emergency recorder is in service, and the transferred regular recorder is in trouble, determine whether there will be sufficient district junctors arranged for AMA in service to care for traffic if the district junctors associated with the recorder to be removed from service are made busy.

3.04 If there will be sufficient district junctors in service, make busy the district junctors associated with the recorder to be removed from service as covered in Section 216-405-301. Check that the primary hold magnets of all the district junctors on the associated primary district link switches have restored to normal. At the transverter trouble indicator frame, insert a No. 322A plug into the MB- jack associated with the recorder to be removed from service.

3.05 If there will not be sufficient district junctors in service, make busy the recorder to be removed from service by inserting a No. 322A plug into the associated MB- jack at the transverter trouble indicator frame.

Emergency Recorder and Preference Circuits and All Individual Pieces of Apparatus in These Circuits

3.06 If the emergency recorder is not in service, insert a No. 322A plug into the EMG RCDR MB jack at the transverter trouble indicator frame.

3.07 If the emergency recorder is in service and the transferred regular recorder is not in trouble, determine whether it is satisfactory to restore the transferred regular recorder to service and if so, remove the plug from the associated TN- jack at the transverter trouble indicator frame. Observe that the EW lamp associated with the emergency recorder is extinguished, then make the emergency recorder busy by inserting a No. 322A plug into the EMG RCDR MB jack at the transverter trouble indicator frame.

3.08 If the emergency recorder is in service and the transferred regular recorder is in trouble, determine whether there will be sufficient district junctors arranged for AMA available to care for traffic, if the district junctors associated with the transferred regular recorder are removed from service.

3.09 If sufficient district junctors will be available, make busy the district junctors associated with the emergency recorder as covered in Section 216-405-301. Check that the primary hold magnets of all the district junctors on the associated primary district link

switches have restored to normal. At the transverter trouble indicator frame insert a No. 322A plug into the EMG RCDR MB jack.

3.10 If sufficient district junctors will not be available, make busy the emergency recorder by inserting a No. 322A plug into the EMG RCDR MB jack associated with the emergency recorder at the transverter trouble indicator frame.

Transfer and Make Busy Circuit and All Individual Pieces of Apparatus in This Circuit

3.11 Make busy the district junctors associated with the recorder as covered in Section 216-405-301.

Caution: The removal of district junctors from service may result in a shortage of available district junctors for handling service calls.

3.12 If there is a No. 322A plug in the associated MB- or TN- jack at the transverter trouble indicator frame, remove it to restore the circuit to normal.

Emergency Recorder Make Busy Circuit and All Individual Pieces of Apparatus in This Circuit

3.13 If the emergency recorder is not in use, insert a No. 322A plug into the EMG RCDR MB jack at the transverter trouble indicator frame.

3.14 If the emergency recorder is in use in place of a regular recorder in trouble, make busy the district junctors associated with the transferred regular recorder as covered in Section 216-405-301.

Caution: The removal of district junctors from service may result in a shortage of available district junctors handling service calls.

3.15 If the emergency recorder is in use in place of a regular recorder not in trouble, transfer the associated call identity index back to its regular recorder by removing the No. 322A plug from the TN- jack and observe that the EW lamp associated with the emergency recorder, is extinguished. Insert a No. 322A plug into the EMG RCDR MB jack on the transverter trouble indicator frame.

Transverter Connector (TC-) Relay

3.16 Proceed as outlined in 3.01 to 3.10, inclusive. Make busy the transverter associated with the TC- relay to be taken out of

service, by inserting a No. 322A plug into the associated TVMB- jack at the transverter trouble indicator frame.

Transverter Trouble Indicator and Master Timing Circuit Connector (TI, TIA, and TIB) Relays

3.17 If the relay to be taken out of service is associated with an odd numbered regular recorder or with the emergency recorder, determine whether there will be sufficient district junctors arranged for AMA available on even numbered district frames to care for traffic, if all district junctors arranged for AMA on the odd numbered district junctor frames are removed from service. If sufficient district junctors will be available, make busy all the AMA district junctors associated with all the odd numbered district junctor frames as covered in Section 216-405-301.

3.18 If the relay to be taken out of service is associated with an even numbered regular recorder, determine whether there will be sufficient district junctors, arranged for AMA, available on odd numbered district junctor frames to care for traffic if all the district junctors arranged for AMA on the even numbered district junctor frames are removed from service. If sufficient district junctors will be available, make busy all the district junctors, arranged for AMA, associated with all the even numbered district junctor frames as covered in Section 216-405-301.

3.19 If sufficient district junctors are not available, then make busy all odd numbered recorders and the emergency recorder, or all even numbered recorders, depending upon the relay to be removed from service, by inserting No. 322A plugs into the associated MB- jacks at the transverter trouble indicator frame.

Perforators

3.20 Proceed as outlined in 3.01 to 3.10, inclusive.

3.21 At the perforator cabinet associated with the recorder out of service, raise the perforator cover and operate and release the AT key approximately ten times to apply a series of 010101 entries.

3.22 Open the cabinet door and disable the reel drive mechanism by placing the slack tape arm on the hook provided for this purpose.

3.23 Cut the unperforated tape at the input chute to the perforator.

3.24 Operate the drum advance mechanism ten times by finger pressure against the armature which is located directly below the right edge of the perforator tape input chute. This will clear the perforated tape from the drum. Then remove the tape from the perforator by pulling on the output end.

3.25 Raise the front of the perforator sufficiently to clear the stop screws, pull it forward to disengage it from its jack and remove the perforator.

3.26 Plug the replacing perforator into the jack from which the perforator was just removed.

3.27 If the perforator is removed for routine maintenance purposes and not because of trouble, proceed as outlined in 3.31 to 3.37, inclusive.

3.28 If the perforator was replaced because it had not been perforating properly, check the entries from the free end of the tape using the KS-14343 tape reader. Determine the first end of tape pattern entry entered on the tape when the recorder was transferred or made busy. The first two entries of the end of tape pattern are as shown below. The digits indicated by XX in the first line correspond to the day and the digits indicated by the XX in the second line correspond to the hour.

First entry - 2821XX
2811XX

3.29 If the end of tape pattern entries were not perforated, determine the location of the first 010101 entry perforated by means of the AT key.

3.30 Using a red china marking pencil, mark XXX on the smooth side of the tape starting at the first end of tape pattern entry or the first 010101 entry in case no end of tape pattern is perforated. Mark the XXX between this entry and the free end of the tape. If the end of tape pattern or the 010101 entries have not been entered on the tape, mark XXX on the unperforated tape near the last entries on the tape.

3.31 Feed the end of the unperforated tape into the input chute of the new perforator. Advance the paper over the drum by operating and releasing the AT key five times.

3.32 Apply two test patterns in accordance with the operation test covered in Section 216-807-501 and omit the inspection of the

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tape at this time. It is not necessary to transfer as covered under this test as the recorder is in condition for applying the test pattern.

3.33 Operate and release the AT key approximately ten times to apply a series of 010101 entries.

→ 3.34 Apply one additional test pattern in accordance with the operation test covered in Section 216-807-501 and inspect the tape as outlined. If the perforator was removed because of trouble mark XXX on the blank portion of tape using a red china marking pencil.

3.35 After replacing the perforator and inspecting the tape, the free end of the tape from the perforator should be interleaved with the free end of the tape on the reel in accordance with Section 034-310-811. Drape the tape on the guide fingers and wind the slack on the take-up reel by removing the slack tape arm from the hook. Close the cabinet door and lower the perforator cover.

3.36 Restore the recorder to service.

3.37 Prepare a shipping tag to be attached to the tape when it is removed at the next cutting period and sent to the accounting center. Indicate on the tag that the cut or torn tape has been interleaved due to a perforator replacement. Also, when the tape has been marked XXX denoting that the replacement of the perforator was due to improper perforations, indicate this information on the accompanying tag.

4. PRECAUTIONS TO BE FOLLOWED WHEN WORKING ON THE APPARATUS

4.01 Working on any of the apparatus in the regular or emergency recorder between the hours of 2:55 A.M. to 3:30 A.M. may interfere with the 3:00 A.M. end of tape pattern entries.

4.02 Before working on individual pieces of apparatus (except the TTIB relay) in the regular or emergency recorder, insert a No. 322A plug into the associated TIB- jack at the transverter trouble indicator frame, to avoid the possibility of having the recorder call in the transverter trouble indicator to register a trouble condition caused by working on the apparatus. Take readings of the associated plant RTR register before and after working on equipment and record the registrations according to local procedure.

4.03 After all work on the apparatus has been completed and if the recorder is out of synchronism as indicated by a lighted OS lamp at the master timing frame, momentarily operate the S (synchronizing) key. Also, before restoring the recorder to service, test the recorder with the recorder test portion of the master timing circuit in the approved manner. After restoring the recorder to service, observe from service calls or make test calls in the approved manner to insure that the released recorder is back in service.

Regular and Emergency Recorders and Preference Circuits

4.04 Remove the recorder from service as covered in 3.01 to 3.10, inclusive. Observe the following precautions when working on the selectors or relays noted in 4.05 to 4.27, inclusive.

4.05 A0 to F7 Relays: Block non-operated the PTS relay. The operation of the PR3 relay to prevent EO to F7 relays from locking operated will bring in a minor alarm. To prevent the alarm, block non-operated the ON relay.

4.06 ADT, AT, HRL, HRT and TCT Relays: At the perforator cabinet associated with the recorder, disconnect the perforator plug from its jack by raising the front of the perforator sufficiently to clear the stop screws and then pulling the perforator forward approximately one inch, in order to prevent unnecessary tape perforations.

→ 4.07 DTN, HR2, HTA, M and RN Relays: Proceed as outlined in 4.06. To prevent bringing in the minor alarm when these relays are operated, block non-operated the ON relay.

4.08 CH, CK, DS, HP, HPA, HS, PR3, TBL, TVM, TVM1, XP1, XT and XU Relays: To prevent perforating the tape when the HP, HPA or HS relays are operated and to prevent bringing in the minor alarm when any of these relays are operated, block non-operated the ON relays.

4.09 ATS Relay: Block non-operated the AT relay to prevent perforating the tape.

4.10 C Relay: To isolate the C relay, insulate the following relay contacts of the master timing circuit:

Recorder Removed from Service	Insulate Contact	Master Timer Relay	
		TT Key in E Position	TT Key in O Position
0	10B	BE1	B01
1	10B	BE2	B02
2	8B	BE1	B01
3	8B	BE2	B02
4	6B	BE1	B01
5	6B	BE2	B02
6	4B	BE1	B01
7	4B	BE2	B02
8	2B	BE1	B01
9	2B	BE2	B02
10	2T	BE1	B01
11	2T	BE2	B02
12	4T	BE1	B01
13	4T	BE2	B02
14	6T	BE1	B01
15	6T	BE2	B02
16	8T	BE1	B01
17	8T	BE2	B02
18	10T	BE1	B01
19	10T	BE2	B02
EMG	12T	BE2	B02

4.11 Before restoring the recorder to service, synchronize the recorder with the master timing circuit by momentarily operating the S key at the master timing frame.

4.12 CA Relay: To isolate the CA relay, block non-operated the C relay. Before restoring the recorder to service, synchronize the recorder with the master timing circuit by momentarily operating the S key at the master timing frame.

4.13 H, T and U Selectors and H, HH, T, TH, U and UH Relays: Before restoring the recorder to service, synchronize the recorder with the master timing circuit by momentarily operating the S key at the master timing frame.

4.14 HR3 Relay: To prevent perforating the tape, bringing in the major alarm and lighting the recorder HR lamp, block non-operated the HRA relay. Do not work on this relay during the interval from one full minute before the hour to one full minute after the hour. Before restoring the recorder to service manually operate the HR3 relay and observe that it locks.

4.15 HRA Relay: This relay, when manually or electrically operated, will bring in the major alarm and light the recorder HR lamp and

the white aisle pilot lamps. Block non-operated the TCl relay to prevent perforating the recorder tape.

4.16 IP and XP Relays: Block non-operated the IPA relay to prevent locking the C relay and throwing the recorder out of synchronism with the master timing circuit. To prevent bringing in the minor alarm, block non-operated the ON relay.

4.17 IPA Relay: To prevent the minor alarm from being brought in if this relay is manually or electrically operated, block non-operated the ON relay. Before restoring the recorder to service synchronize the recorder with the master timer by momentarily operating the S key at the master timing frame.

4.18 MTP Relay: Block non-operated the TIA relay to prevent interfering with the perforating of other recorder tapes and to prevent bringing in the minor alarm.

4.19 NPA Relay: This relay, when manually or electrically operated, will bring in the major alarm and light the recorder NP lamp and the white aisle pilot lamps.

4.20 NS Relay: To isolate this relay insulate the 2B contact of the MBR relay and block non-operated the HRA and HS relays.

4.21 ON Relay: The manual or electrical operation of this relay for approximately .5 second will bring in the minor alarm. To prevent this alarm, block non-operated the TA relay.

4.22 SYC Relay: This relay is operated by the master timing circuit approximately 4 seconds of each minute.

4.23 TB Relay: The manual or electrical operation of this relay will bring in the minor alarm. To release the alarm momentarily operate the RL key at the transverter trouble indicator frame.

4.24 TCl Relay: To prevent the minor alarm from being brought in, block non-operated the IP relay.

4.25 TP- Relays: At the transverter trouble indicator frame, insert a No. 322A plug into the TVMB- jack of the transverter associated with the TP- relay. To prevent bringing in the minor alarm, block non-operated the ON relay.

4.26 W, Z, ZD and ZU Relays: After all work on these relays has been completed momentarily operate the recorder AT (advance tape)

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key to synchronize the recorder paper advance check circuit with the perforator drum position. This may bring in the minor alarm. To release the alarm, momentarily operate the RL key at the transverter trouble indicator frame.

4.27 XTC Relay: Block non-operated the TC1 relay to prevent perforating the tape and bringing in the minor alarm.

Transfer and Make Busy Circuit

MB, MBJ, MBR, MTR, RNT, TNS and XRB Relays

4.28 Remove from service the district junctors associated with the recorder as covered in Section 216-405-301. If there is a plug in the associated TN- or MB- jack at the transverter trouble indicator frame, remove the plug to restore the relays to normal. Observe the following precautions when working on the relays noted in 4.29 to 4.37, inclusive.

4.29 MB Relay: Insulate the 6B contact of the MBR relay to prevent calling in the master timing circuit.

4.30 MBJ Relay: Block non-operated the MB relay to prevent calling in the master timing circuit.

4.31 MBR Relay: Insulate the 7B contact of the MB relay to prevent calling in the master timing circuit.

4.32 RNT Relay: If the emergency recorder is in service, remove it from service as outlined in 3.06 to 3.10, inclusive to prevent interference in recording the emergency recorder number entry.

4.33 TNS Relay: Block non-operated the MB relay to prevent calling in the master timing circuit.

4.34 XRB Relay: When this relay is manually or electrically operated, it will bring in the major alarm and light the recorder XRB lamp and the white aisle pilot lamps.

TN and TN1 to TN10 Relays

4.35 Remove the recorder from service as outlined in 3.04 and 3.05 and remove the emergency recorder from service as outlined in 3.06 to 3.10, inclusive.

RT and RT1 Relays

4.36 If the recorder is an even numbered recorder and if there will be sufficient district junctors arranged for AMA in service

to care for traffic, make busy all the district junctors associated with the even numbered recorders as covered in Section 216-405-301. Check that the primary hold magnets of all the district junctors on the associated primary district link switches have restored to normal. If the recorder is an odd numbered recorder and if there will be sufficient district junctors arranged for AMA in service to care for traffic make busy all the district junctors associated with the odd numbered recorders and the emergency recorder as covered in Section 216-405-301. Check that the primary hold magnets of all the district junctors on the associated primary district link switches have restored to normal.

4.37 If the recorder is an even numbered recorder and there will not be sufficient district junctors arranged for AMA in service to care for traffic, make busy all the even numbered recorders by inserting No. 322A plugs into the associated MB- jacks at the transverter trouble indicator frame. If the recorder is an odd numbered recorder and if there will not be sufficient district junctors arranged for AMA in service to care for traffic, make busy the emergency recorder and all the odd numbered recorders by inserting No. 322A plugs into the associated MB- jacks at the transverter trouble indicator frame.

Emergency Recorder Make Busy Circuit

MB, MBJ, MBR, MTR, RT, RT1, RNT and XRB Relays

4.38 If the emergency recorder is in use in place of a regular recorder in trouble, remove from service the district junctors associated with the transferred regular recorder as covered in Section 216-405-301. If the emergency recorder is in use in place of a regular recorder not in trouble, transfer the regular recorder back into service by removing the plug from the associated TN- jack at the transverter trouble indicator frame. Observe that the EW lamp associated with the emergency recorder is extinguished. Also observe the following precautions when working on the relays noted in 4.39 to 4.44, inclusive.

4.39 MB Relay: To prevent calling in the master timing circuit, insulate the 6B contact of the MBR relay.

4.40 MBJ Relay: To prevent calling in the master timing circuit, block non-operated the MB relay.

4.41 MBR Relay: To prevent calling in the master timing circuit, insulate the 7B contact of the MB relay.

4.42 RT and RTI Relays: If there will be sufficient district junctors arranged for AMA in service to care for traffic, make busy all the district junctors associated with the emergency recorder and all the odd numbered recorders, as covered in Section 216-405-301.

4.43 If there will not be sufficient district junctors arranged for AMA in service to care for traffic, make busy the emergency recorder and all the odd numbered recorders by inserting No. 322A plugs into the associated MB- jacks at the transverter trouble indicator frame.

4.44 XRB Relay: When this relay is operated either manually or electrically, the recorder XRB lamp and the white aisle pilot lamps will be lighted and the major alarm will be brought in.

Transverter Connector (TC-) Relays

4.45 Proceed as outlined in 3.01 to 3.10, inclusive. Make busy the transverter associated with the TC- relay by inserting a No. 322A plug into the associated TVMB- jack at the transverter trouble indicator frame.

Transverter Trouble Indicator and Master Timing Circuit Connector (TI, TIA and TIB) Relays

4.46 Proceed as outlined in 3.17 to 3.19, inclusive.

Perforators

4.47 Proceed as outlined in 3.01 to 3.10, inclusive and 3.21 to 3.36, inclusive.

5. REPORTS

5.01 Any required record of the equipment removed from service should be entered on the proper form.

