SYSTEM RECOVERY GUIDELINES

NO. 2B ELECTRONIC SWITCHING SYSTEM

1. GENERAL

1.01 This section provides procedural guidelines for the rapid recovery of No. 2B Electronic Switching System (ESS) call processing in the face of serious system disruption. When the automatic emergency actions have failed to establish a working system manual intervention will be necessary. This condition may be indicated by lack of network activity, continuous switching of control units, bootstrapping, teletypewriter (TTY) messages, etc.

1.02 This is the initial issue of this section.

1.03 Figure 1 should be used when there is a craftsperson at the central office. Figure 2 should be used when only remote TTY communication is available (as in a surveillance center or TAC).

1.04 The procedures are presented in flowchart form to enable the user to quickly arrive at the most likely cause of the problem and to take appropriate corrective action. *The flowcharts given should be followed any time a serious system disruption occurs even if it is felt that the problem is entirely a hardware problem.*

1.05 The flowcharts (Fig. 1 and 2) assumes no prior knowledge of the system condition other than the systems' inability to process calls. The intra flowchart referencing is accomplished by double letters within the connector symbols, e.g. (AA) When the connector symbol directs the user to a different sheet within the flowchart, the sheet number will appear adjacent to the symbol.

1.06 If the procedures in the flowchart do not lead to the restoration of service, the problem under investigation is beyond the scope of this section and other trouble clearing methods should be employed.

1.07 Notes accompany the flowchart to provide a more detailed explanation of some operations. The note associated with a flowchart symbol is indicated in the symbol by an encircled letter, e.g., (A). The notes are provided in 2.01.

1.08 Some useful material to supplement this section may be found in Section 232-306-301. Control and Display Procedures and Section 232-313-301 System Initialization Procedures.

1.09 In this section, the use of the terms *operate* and *release* refer to successive depressions of a locking type key. The term *depress* refers to each momentary operation of a nonlocking type key. Relays operated through the depressing of a nonlocking type key requires a depression of at least one-half second to insure system recognition. Some keys that can be *operated* manually can also be *released* by program.

2. SUPPLEMENTAL NOTES FOR RECOVERY PROCEDURES

2.01 The following notes are referred to by the flowcharts and will be used whenever they are identified in one of the symbols of the procedure.

(A) Whether or not a control unit (CU) is running can be determined by the success of any of the following checks. Perform these checks in the sequence given and stop when one check is successful.

(1) At the maintenance TTY— Type the "!" character. Successful response is "?A" with a carriage return and line feed two times in succession.

(2) At the SYSTEM EMERGENCY MANUAL CONTROL panel—Depress the TTY INIT key. Successful response is an INIT TTYC ALL message, and the TTY INIT key is immediately extinguished.

Ⓑ At the maintenance center frame SYSTEM EMERGENCY MANUAL CONTROL section of the SSP select the CU to be forced active by operating the SELECT - key. Operate the FORCE key to force the selected CU active. Observe that the SELECT - key for the inactive CU is released.

Ⓒ All system initializations are executed from the SYSTEM EMERGENCY MANUAL CONTROL section of the SSP at the maintenance frame. Execute the type of emergency actions called for in the flowcharts as follows:

(1) Observe lamp indications on the SYSTEM STATUS AND CONTROL PANEL.

(2) If SERVICE LOSS lamp is flashing wait until it stops flashing before proceeding except when a memory reload, backdate initialization or a bootstrap operation is desired.

For an EMERGENCY AUDIT INITIALIZATION:

(3) Operate ENABLE key.

(4) Depress INIT EXECUTE key.

Note: If an initialization takes place, the operated key will be released by program action.

For a TRANSIENT CLEAR INITIALIZATION:

(3) Operate the SELECT — and FORCE keys if no CU is locked on-line.

(4) Operate ENABLE key.

(5) Depress INIT EXECUTE key.

(6) Operate ENABLE key.

(7) Depress INIT EXECUTE key.

(8) Release FORCE key if operated in Step 3 above.

Note: If an initialization takes place, the operated key will be released by program action.

For a RECENT CHANGE CLEAR INITIALIZATION:

(3) Operate ENABLE key.

(4) Operate RECENT CHANGE key.

(5) Depress INIT EXECUTE key.

Note 1: If an initialization takes place, the operated keys will be released by program action.

Note 2: Inform service order personnel that a recent change (RC) clear initialization is being performed and request to have the RC paper tapes available to reinput changes when the machine is running well.

For a STABLE CLEAR INITIALIZATION:

(3) Operate ENABLE key.

(4) Operate STABLE key.

(5) Depress INIT EXECUTE key.

Note: If an initialization takes place, the operated keys will be released by program action.

For a STABLE AND RECENT CHANGE CLEAR INITIALIZATION:

(3) Operate ENABLE key.

(4) Operate STABLE key.

(5) Operate RECENT CHANGE key.

(6) Depress INIT EXECUTE.

Note 1: If an initialization takes place, the operated keys will be released by program action.

Note 2: Inform service order personnel that an RC clear initialization is being performed and request to have the RC paper tapes available to reinput changes when the machine is running well.

For a MEMORY RELOAD INITIALIZATION:

(3) Operate the SELECT — key for desired CU to reload.

(4) Operate FORCE key.

(5) Operate ENABLE key.

(6) Depress MEMORY RELOAD key.

(7) Operate STABLE key (if a stable clear initialization is desired).

(8) Operate RECENT CHANGE key (if a RC clear initialization is desired).

(9) Depress INIT EXECUTE key.

Note 1: If an initialization takes place, the operated keys will be released by program action.

Note 2: Inform service order personnel that an RC clear initialization is being performed and request to have the RC paper tapes available to reinput changes when the machine is running well.

(10) If tape does not rewind immediately, repeat Steps (5) and (9) a minimum of two additional times.

Ⓓ Attempt to restore power to the converters by operating the POWER key on the 3A central control panel of the appropriate frame. If power cannot be applied to the converters, replace the bad converter pack.

Ⓔ To power down the CU:

(1) Ensure that the SELECT key for the desired off-line CU is released at the SYSTEM EMERGENCY MANUAL CONTROL panel.

(2) Operate the SELECT key for the desired on-line CU.

(3) Operate FORCE key.

Note: Any time *both* CUs are powered down a bootstrap operation must be performed *with* a stable and RC clear initialization to

load memory before attempting to run after powering up.

(4) At the front of the 3A central control panel of the selected processor frame, operate the MANUAL key.

(5) At the back of the 3A central control panel set the TEST MODE switch to the TEST MODE position.

(6) At the front of the 3A central control panel depress the POWER key.

(7) Check that all lamps on the 3A central control panel are off except the TEST MODE lamp.

Note: If CU cannot be powered down, replace board FA1032 54-25 and FA1033 54-24. If this does not help, obtain further technical assistance.

Ⓕ To restore power to the CU:

(1) Depress POWER key.

(2) At the front of the 3A central control panel, release the MANUAL key.

(3) Check that some of the lamps and LEDs are lighted on the 3A central control panel.

Ⓖ To display the error register (ERR) on the 3A central control panel LOAD AND DISPLAY LEDS operate the following switches and keys on the 3A central control panel of the on-line CU.

(1) At the back of the 3A central control panel set the TEST MODE switch to the TEST MODE position.

(2) At the front of the 3A central control panel operate the MANUAL key.

(3) Set the HALT switch to the up position.

(4) Set the REGISTER-DISPLAY switch to the up position.

(5) Set the SPECIAL-GENERAL switch to the SPECIAL position.

(6) Set REGISTER SELECT switches 8, 2 and 1 to the up position.

(7) At the REGISTER SELECT section the ERR LED should be lighted.

(8) All other switches should be in the down position.

(9) Momentarily set the EXECUTE switch to the up position (this switch is spring loaded and is normally in the down position).

(10) The contents of the error register is displayed on the LOAD AND DISPLAY LEDs.

(H) Test calls should include at least one intraoffice, one outgoing and one incoming call on **each** network. If an incoming call fails, make sure the distant office did not take the trunk out-of-service.

(I) A full dial tone check should include at least one terminal equipment number (TEN) on each network.

(J) Check for dial tone at each concentrator group of each network.

(K) See Input Message Manual (IM-2H200) and Output Message Manual (OM-2H200) for a detailed explanation of audit requests, postmortem dumps and/or other printouts.

(L) Check for dial tone on each concentrator group that was **previously** missing dial tone.

(M) Line Scanner AB is associated with concentrator groups 0, 1, 2, and 3. Line scanner CD is associated with concentrator groups 4, 5, 6, and 7.

(N) The 3A central control program timer can be shut off by setting the TEST MODE switch on back of the 3A central control panel to the TEST MODE position. When this switch is set to the TEST MODE position, the TEST MODE lamp on the front of the panel is lighted.

(O) The initialization sanity check (ISC) bits are used to check the sanity of the software initialization routines. Failures detected by these bits may result in a switch to the other 3A central control or the reloading of memory (refer to PK-1C900).

(P) A system bootstrap is recognized by a continuously moving pair of lights on the CU and SSP display buffers and/or the TTY bell sounding at approximately 1/2 second intervals.

(R) The bootstrap has completed when the changing bootstrap pattern on the display buffer and TTY bell ceases.

(S) Force an initialization by typing the following:

LOD:ST a;SGL:777!

Where: a = address of CURMON in Program' CTSD

Repeat the above message until desired (automatic) initialization level (or bootstrap) is reached.

(T) Send a craftsperson to the local central office. Upon arrival, restart recovery procedure from the beginning.

(U) Can calls be completed properly? Consider interoffice, incoming and outgoing, if possible. If incoming calls fail, make sure the distant office did not take its outgoing trunk out of service.

Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 1 of 6)

(GG)

REMOVE ORIGINAL TAPES. INSERT A (NEXT) OLDER COPY OF TAPE IN ON-LINE TDC (ONLY). EXECUTE STABLE CLEAR, RECENT CHANGE CLEAR AND MEMORY RELOAD INITIALIZATION **(C)**

↓

WAIT FOR BOOTSTRAP TO COMPLETE **(R)**

↓

IS A CU BOOTSTRAPPING **(P)** — NO → **START** SH 1

↓ YES

HAS OTHER CU BEEN TRIED WITH OFF-LINE POWERED DOWN — YES → SEEK FURTHER TECHNICAL ASSISTANCE

↓ NO

RETURN OFF-LINE TMR SWITCH TO NORM. POWER UP OFF-LINE

↓

FORCE OFF-LINE CU ON-LINE. REPLACE ORIGINAL TAPES IN TDCs **(B)**

↓

(FF) SH 1

(BB)

IS TMR ON IN EITHER CU OR IS SYSTEM LOCKED OR FORCED — NO → PLACE BOTH CUs IN MANUAL

↓ YES

PLACE TMR TO NORMAL ON BOTH CUs. REMOVE FROM FORCE

↓

START SH 1

PLACE BOTH CUs IN MANUAL

↓

CHECK FOR POWER ALARMS ON FRAMES AND CONVERTERS

↓

ANY POWER ALARMS ON — NO →

↓ YES

TURN ON THE TMR IN CU WITH POWER ALARM AND POWER IT DOWN. REPLACE BAD PACKS. POWER UP AND TURN TMRs TO NORMAL **(N)(D)**

(NN) →

↓

IS A CU BOOTSTRAPPING **(P)** — YES →

↓ NO

HAVE BOTH CUs BEEN POWERED DOWN — YES → SEEK FURTHER TECHNICAL ASSISTANCE

↓ NO

FORCE A CU NOT PREVIOUSLY POWERED DOWN ON-LINE. STRAP ISC BITS (58-16-116) TO GROUND **(B)**

↓

(HH)

(HH)

OPERATE ENABLE AND INIT EXECUTE

↓

IS A CU RUNNING **(A)** — NO → OPERATE ENABLE AND INIT EXECUTE

↓ YES

(AA) SH 3

IS A CU RUNNING **(A)** — YES → **(AA)** SH 3

↓ NO

EXECUTE A STABLE CLEAR INITIALIZATION **(C)**

↓

(KK) SH 3

IS PREVIOUSLY POWERED DOWN CU BOOTSTRAPPING **(P)** — NO → HAS OFFICE BEEN DOWN MORE THAN 8 MINUTES — NO →

↓ YES

EXECUTE A STABLE CLEAR, RECENT CHANGE CLEAR AND A MEMORY RELOAD INITIALIZATION **(C)**

HAS OFFICE BEEN DOWN MORE THAN 8 MINUTES ↓ YES

EXECUTE A STABLE CLEAR INITIALIZATION **(C)**

↓

WAIT FOR BOOTSTRAP TO COMPLETE **(R)** → IS A CU BOOTSTRAPPING **(P)** — NO → **START** SH 1

↓ YES

(FF) SH 1

Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 2 of 6)

(KK)

IS A CU RUNNING (A) → YES → (AA)

NO

EXECUTE A STABLE CLEAR AND RECENT CHANGE CLEAR INITIALIZATION (C)

IS A CU RUNNING (A) → YES → (AA)

NO

STRAP BHC FF IN BACKPLANE (58-10-010) TO GROUND

OPERATE ENABLE AND INIT EXECUTE

IS A CU RUNNING (A) → YES → (AA)

NO

OPERATE ENABLE AND INIT EXECUTE

IS A CU RUNNING (A) → YES → (AA)

NO

EXECUTE A STABLE CLEAR INITIALIZATION (C)

IS A CU RUNNING (A) → YES → (AA)

NO

EXECUTE A STABLE CLEAR AND RECENT CHANGE CLEAR INITIALIZATION (C)

IS A CU RUNNING (A) → YES → (AA)

NO

ON ON-LINE CU, REMOVE STRAP OF ISC BITS. TURN ON TMR SWITCH AND POWER DOWN. POWER UP AND RETURN TMR SWITCH TO NORMAL (N)

(NN) SH 2

(AA)

DOES OFFICE HAVE FULL DIAL TONE (I) → YES → (RR) SH 5

NO

HOW EXTENSIVE IS LACK OF DIAL TONE (J) → ALL NETWORKS → (PP) SH 5

ONE NETWORK

IS DIAL TONE MISSING FROM ALL CONCENTRATOR GROUPS IN THIS NETWORK → NO → (MM) SH 4

YES

REPLACE ANY BLOWN FUSES. OPERATE BOTH BUS AND POWER NORMAL KEYS ON NETWORK FRAME

IS DIAL TONE AVAILABLE NOW (L) → YES → (AA)

NO

REQUEST PU STATUS (M PU:SI!)

(JJ)

(JJ)

DO OS LAMPS ON NETWORK AGREE WITH PU STATUS MSG → YES → (II) SH 4

NO

RESTORE ANY CONTROLLER WHOSE OS LAMPS AND PU STATUS MESSAGE DISAGREE

YES ← DID THE RESTORE WORK (CHECK OS LAMPS)

NO

MANUALLY OPERATE RS00 AND RS11 RELAYS IN THE NETWORK

TYPE A MH NW:RST:f_g h-! MESSAGE FOR BOTH CONTROLLERS IN NETWORK (K)
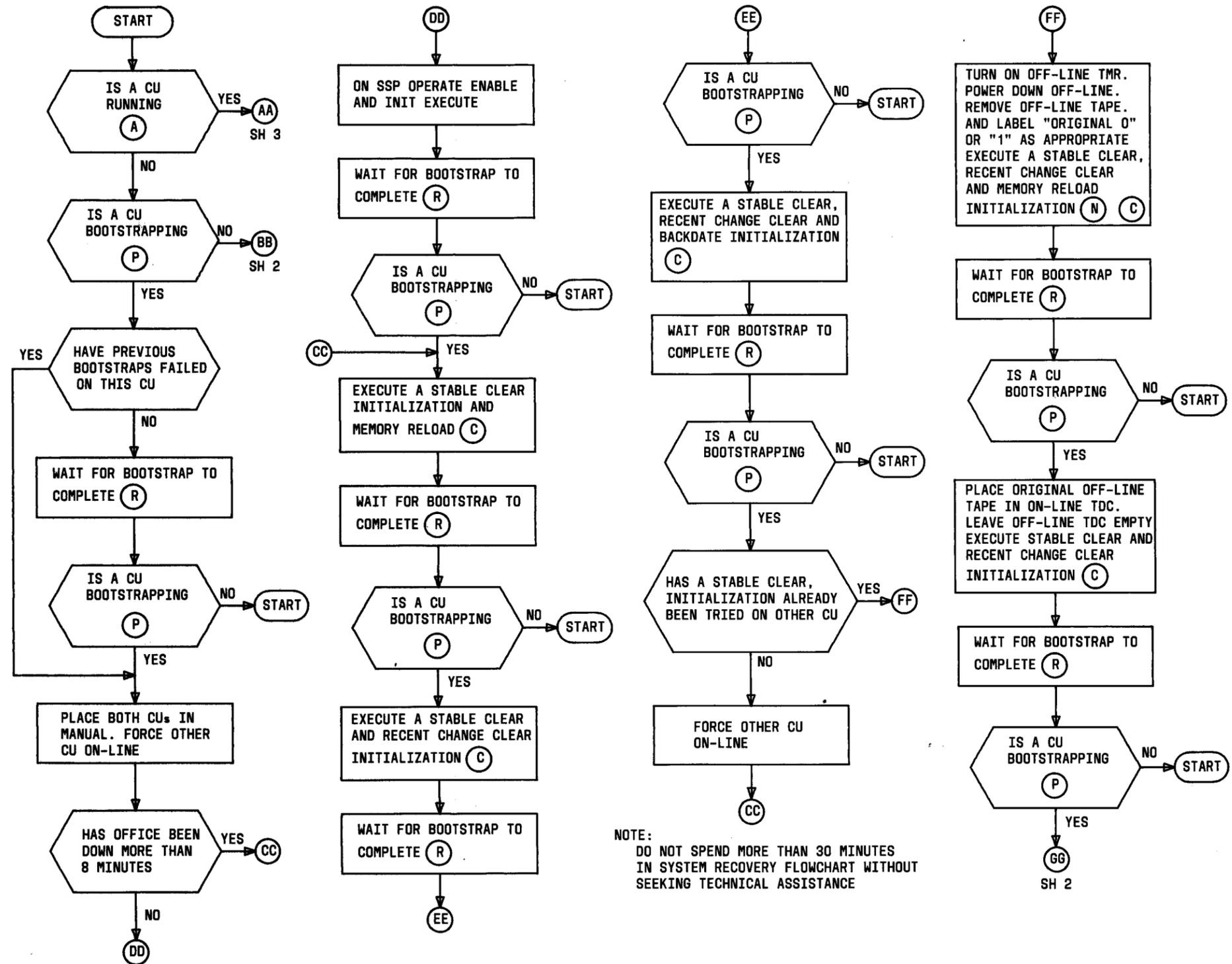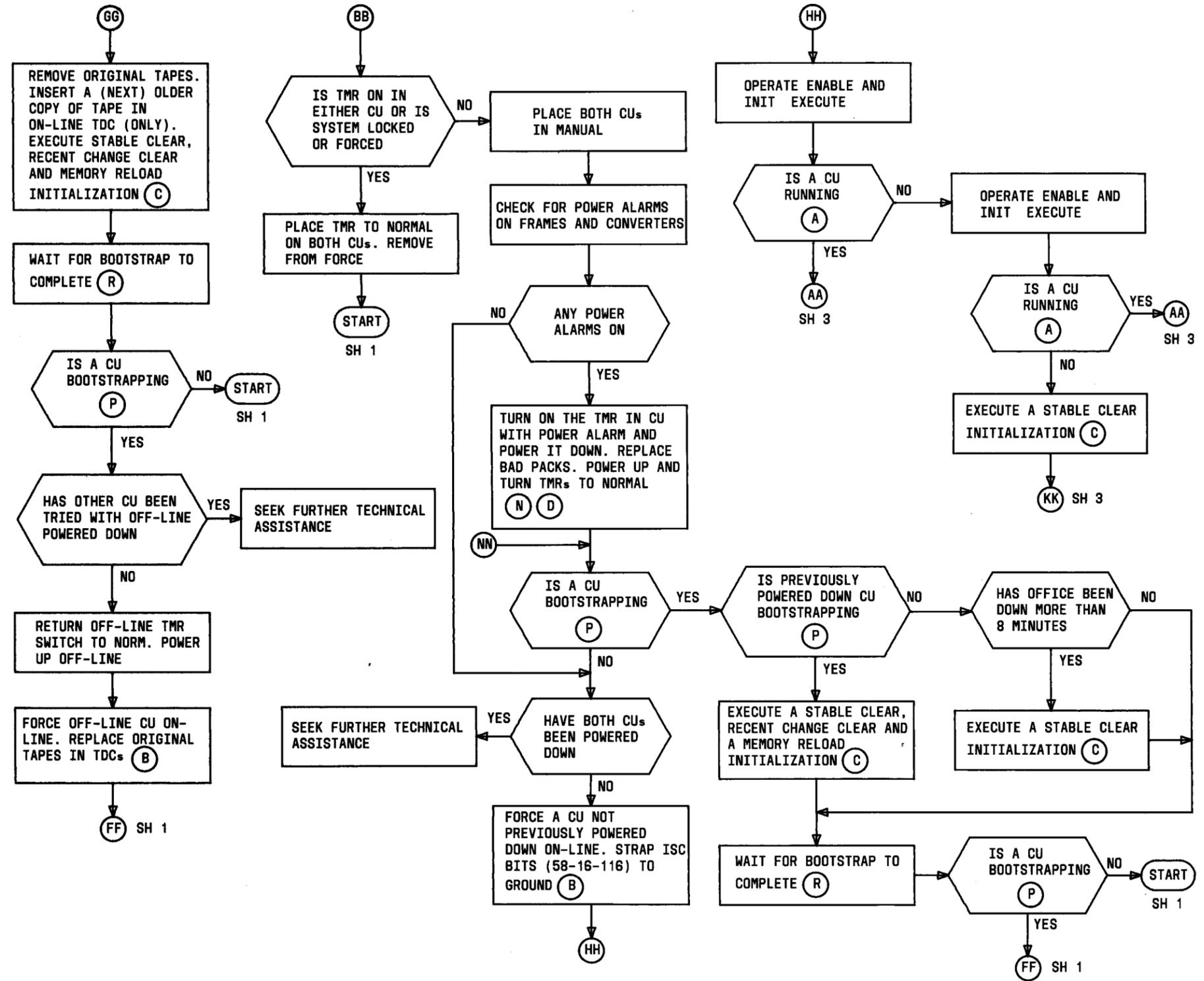
DIAL TONE AVAILABLE NOW (L) → YES → (AA)

NO

(II) SH 4

Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 3 of 6)

Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 4 of 6)

(RR)

↓

```
MAKE TEST CALLS
```

↓

```
IS THERE
EXTENSIVE DIAL     YES
TONE DELAY OR DO  ──→ (SS)
TEST CALLS FAIL
```

↓ NO

```
RUN PERIODIC AND RECENT
CHANGE AUDITS (M AU:ALL
AND A AU:RC) REQUEST
AND ANALYZE PMD. AUDIT
ALL NETS (H) (K)
```

↓

```
        IS POWER OFF    YES
 ←───── THE OFF-LINE
        CU
```

↓ NO

```
ARE TMR
SWITCHES ON OR     NO
HAVE CLIP LEADS  ──→ (UU)
BEEN CONNECTED
```

↓ YES

```
ALLOW THE SYSTEM TIME
TO REDUCE THE BACKLOG
OF WORK. IF FURTHER
TECHNICAL HELP IS
REQUIRED TO RETURN THE
SYSTEM TO ITS OPTIMUM
STATE, OBTAIN THE HELP
IF THE SYSTEM CAN BE
RESTORED WITH THE
CURRENTLY AVAILABLE
AID, PROCEED WITH
CAUTION. REINPUT RC
DATA IF NECESSARY
```

(UU)

↓

```
RESTORE OFF-LINE CU TO
SERVICE (RST:CU!) (K)
```

↓

```
IS OFF-LINE    YES    REPORT TROUBLE VIA
CU RESTORED   ──→     NORMAL LOCAL PROCEDURE
```

↓ NO

```
USE DGN OUTPUT MESSAGE
TO LOCATE AND CORRECT
TROUBLE (K)
```

↓

```
     YES
 ←──       IS TROUBLE
           CLEARED
```

↓ NO

```
OBTAIN FURTHER
TECHNICAL ASSISTANCE
```

```
IS SYSTEM IN       FOLLOW PROCEDURES
BACKDATE STATE  YES FROM BSP 232-304-301
(BACKDATE KEY  ──→  UPDATING MAIN STORE
LIGHTED             TRANSLATION INFORMATION
```

↓ NO

```
IF NECESSARY, REINPUT
RECENT CHANGE DATA
```

(PP)

↓

```
IS DIAL TONE
ON RINGING      NO     REPAIR RINGING AND
AND TONE       ──→     TONE FRAME
FRAME
```

(SS) → ↓ YES   ↓

```
IS SERVICE                       (AA)
LOSS LAMP       YES              SH 3
FLASHING       ──→     WAIT FOR FLASHING
                       TO STOP
```

↓ NO

```
HAS OFFICE
BEEN DOWN      YES
MORE THAN TEN ──→ (TT)
MINUTES            SH 6
```

↓ NO

```
EXECUTE AN EMERGENCY
AUDIT ININIALIZATION
(C)
```

↓

```
IS THERE
EXTENSIVE DIAL    NO    (AA)
TONE DELAY OR DO ──→    SH 3
TEST CALLS FAIL
(H)
```

↓ YES

(QQ)
SH 6

Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 5 of 6)

```
                        ┌──────────┐
                        │   (QQ)   │
                        └────┬─────┘
                             │
              ┌──────────────┴──────────┐      ┌──────────────────┐
              │  IS SERVICE              │ YES  │  WAIT FOR FLASHING│
              │  LOSS LAMP               ├─────►│  TO STOP          │
              │  FLASHING                │      └──────────────────┘
              └──────────────┬──────────┘
                            NO
```

IS SERVICE LOSS LAMP FLASHING — YES — WAIT FOR FLASHING TO STOP

HAS OFFICE BEEN DOWN MORE THAN TEN MINUTES — YES — (TT)
NO

EXECUTE TRANSIENT CLEAR INITIALIZATION (C)

IS THERE EXTENSIVE DIAL TONE DELAY OR DO TEST CALLS FAIL (H) — NO — (AA) SH 3
YES

IS SERVICE LOSS LAMP FLASHING — YES — WAIT FOR FLASHING TO STOP
(TT) — NO

EXECUTE A STABLE CLEAR INITIALIZATION (C)

IS THERE EXTENSIVE DIAL TONE DELAY OR DO TEST CALLS FAIL (H) — NO — (AA) SH 3
YES

FORCE ACTIVE CU ON-LINE AND PLACE BOTH CUs IN MANUAL (B)

EXECUTE A STABLE CLEAR AND MEMORY RELOAD INITIALIZATION (C)

IS THERE EXTENSIVE DIAL TONE DELAY OR DO TEST CALLS FAIL (H) — NO — (AA) SH 3
YES

IS SERVICE LOSS LAMP FLASHING — YES — WAIT FOR FLASHING TO STOP
NO

EXECUTE A STABLE CLEAR AND RECENT CHANGE CLEAR INITIALIZATION (C)

IS THERE EXTENSIVE DIAL TONE DELAY OR DO TEST CALLS FAIL (H) — NO — (AA) SH 3
YES

EXECUTE A STABLE CLEAR, RECENT CHANGE CLEAR, MEMORY RELOAD AND BACKDATE INITIALIZATION

IS THERE EXTENSIVE DIAL TONE DELAY OR DO TEST CALLS FAIL (H) — NO — (AA) SH 3
YES

HAS OTHER CU BEEN TRIED — YES — SEEK FURTHER TECHNICAL ASSISTANCE
NO

IS SERVICE LOSS LAMP FLASHING — YES — WAIT FOR FLASHING TO STOP
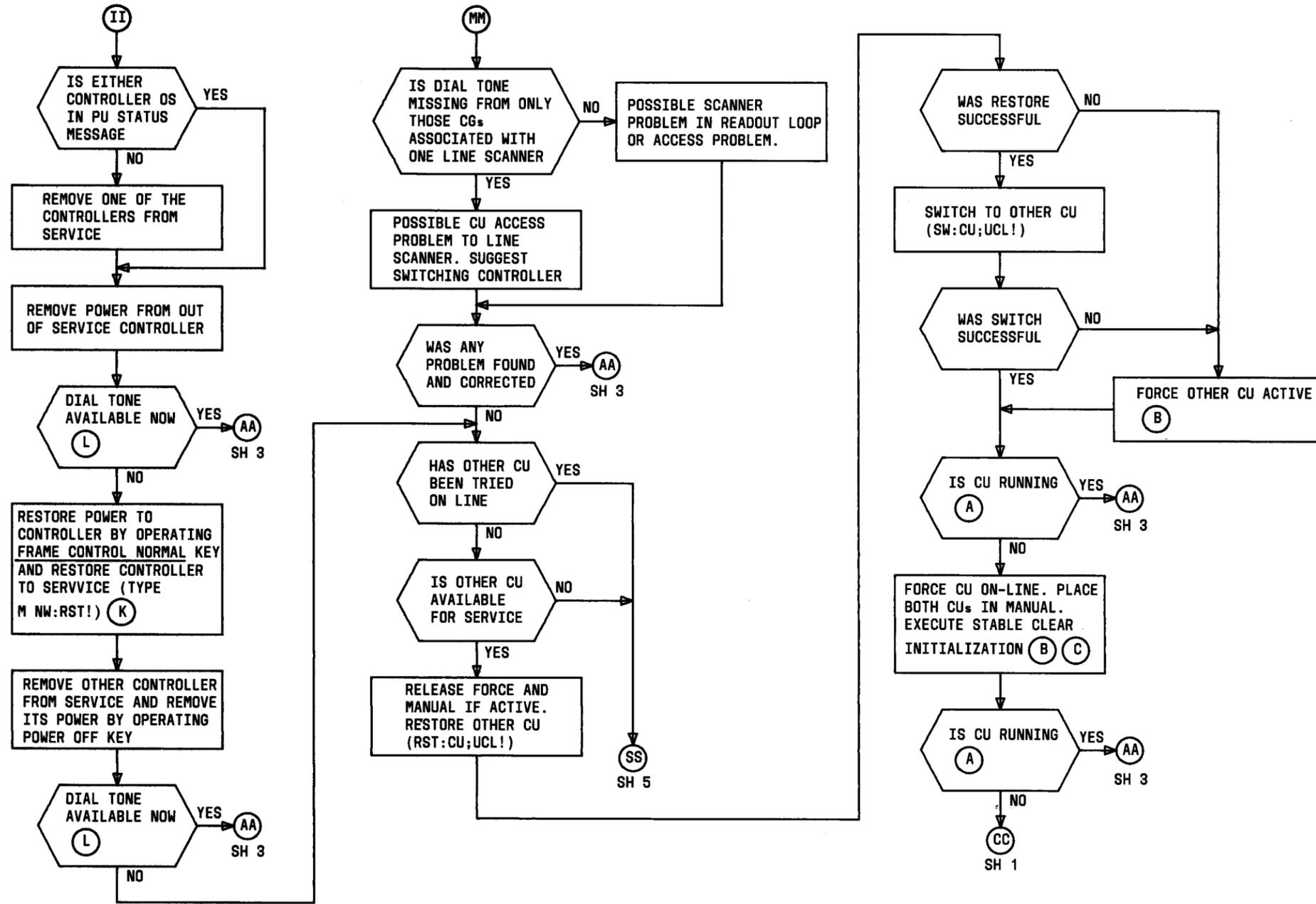NO

FORCE OTHER CU ACTIVE (B)

(TT)
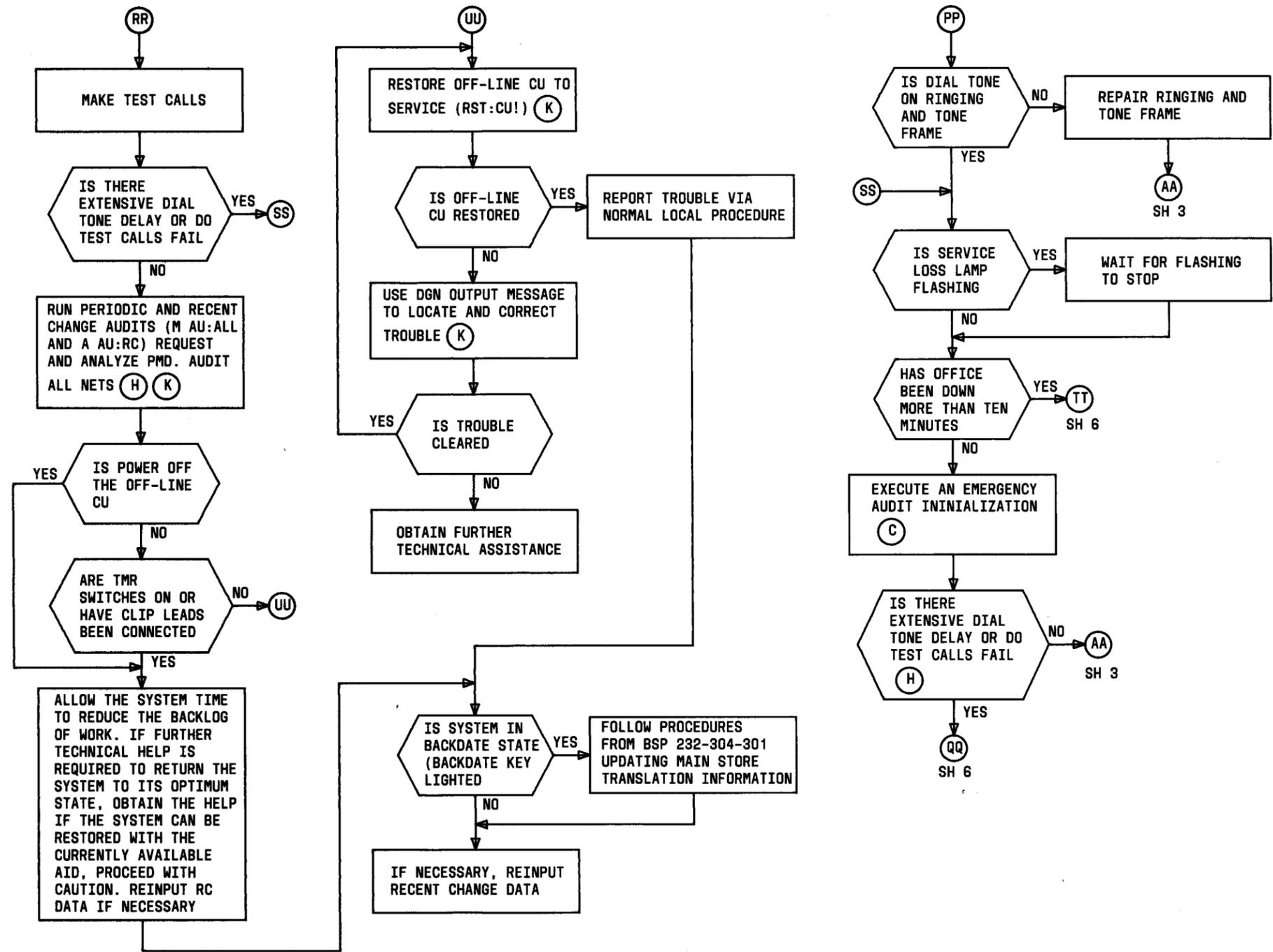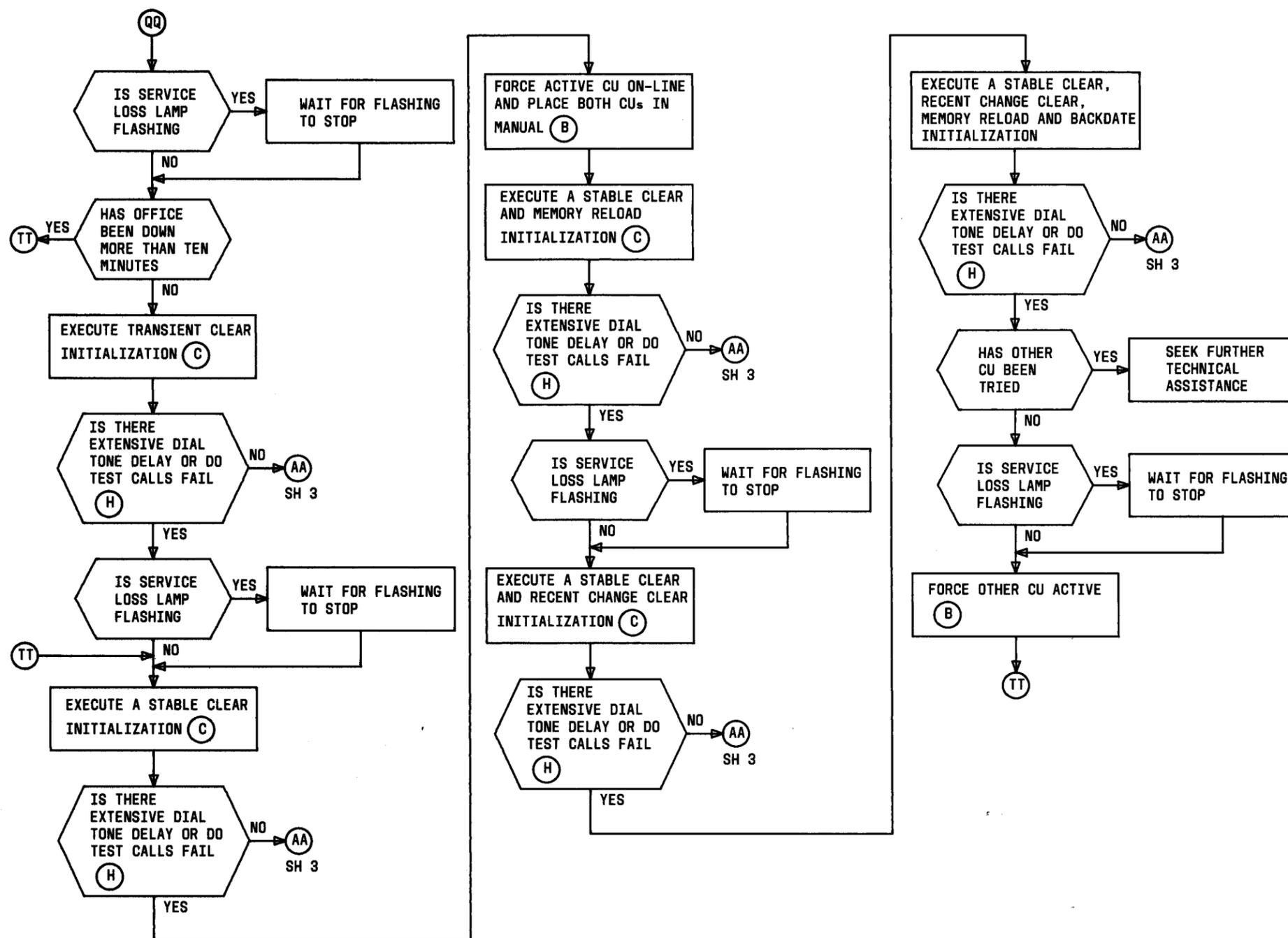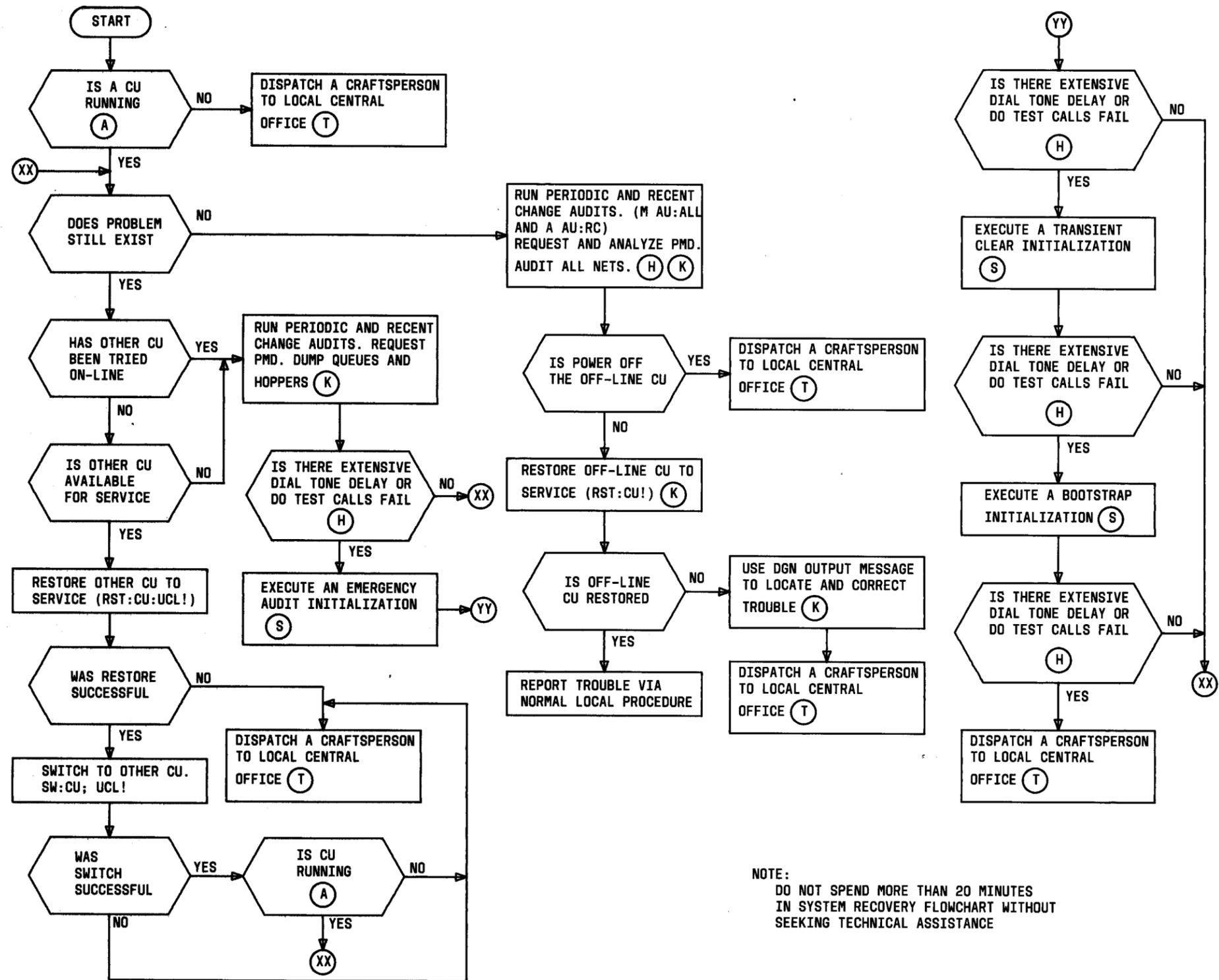
Fig. 1—No. 2B ESS System Recovery Flowchart (Sheet 6 of 6)

Fig. 2—No. 2B ESS System Recovery Flowchart

NOTE:
DO NOT SPEND MORE THAN 20 MINUTES
IN SYSTEM RECOVERY FLOWCHART WITHOUT
SEEKING TECHNICAL ASSISTANCE