# DECODERS

# MISCELLANEOUS TESTS

# STEP-BY-STEP COMMON CONTROL OFFICES

## 1. GENERAL

1.01 This section describes a method of making miscellaneous tests of decoders for step-by-step offices equipped with common control.

1.02 The tests covered are:

*A. Overregistration and Crossed Leads on Seizure:* This test checks that minor and major alarms are sounded when overregistration occurs and when certain leads are crossed on seizure.

*B. Class-of-Service Cross Alarm and Recycle Control:* This test checks that a minor alarm sounds when two class-of-service relays operate on a first trial and that the work timer is recycled on a second trial. It also checks that if a class-of-service indication is not registered, the WT timer will recycle on second trial and sound a major alarm after time-out.

*C. Transmitted Information Check and Crossed Transmitting Leads Alarm:* This test checks normal operation of the information check relays. It also checks alarm features of crossed transmitting leads.

*D. Crossed Cancel Alternate Route:* This test checks that a major alarm sounds when a CAR- relay operates with the associated CAR-key normal.

*E. Foreign Area Translator Seizure and Trouble Alarm:* This test checks that a minor and major alarm sounds when the decoder attempts to seize two foreign area translators simultaneously.

1.03 ***Caution: If during these tests a regular alarm should originate, the tests should be discontinued immediately so that the alarm will sound in the normal manner. Notify the proper persons that a regular alarm is sounding.***

1.04 All tests require removal of the decoder under test and its associated translator from service.

1.05 Test D will cause CAR registers in the traffic register circuit to be scored. Local instructions should be followed for recording and reporting those register operations.

1.06 All tests require actions and verifications at the decoder under test and at the jack, key, and lamp circuit. Tests A, B, and C also require actions and verifications at the associated translator.

1.07 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

## 2. APPARATUS

### All Tests

2.01 322A (make-busy) plugs, as required.

2.02 Blocking and insulating tools, as required. Use tools and apply, as covered in Section 069-020-801.

**Tests A and E**

**2.03** Two testing cords, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord), one KS-6278 connecting clip, and one 624B (terminal connector) tool (for use in applying ground connections to terminal strips).

**Tests C and E**

**2.04** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord), one KS-6278 connecting clip, one 639A (relay contact connector) tool, and one 651D and one 651B (relay contact connector holder) tool (for making battery or ground connection to relay springs).

**2.05** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and two KS-6278 connecting clips (for use in connecting 19-type resistors).

**2.06** One 19UA and one 19BT resistor (used in applying resistance battery).

## 3. PREPARATION

| STEP | ACTION | VERIFICATION |
|---|---|---|
| **All Tests** | | |
| 1 | At jack, key, and lamp circuit —<br>Insert make-busy plug into TMB- jack associated with decoder under test. | |
| 2 | Insert make-busy plug into TTMB DR- jack associated with decoder under test. | |

## 4. METHOD

| STEP | ACTION | VERIFICATION |
|---|---|---|
| | **A. Overregistration and Crossed Leads on Seizure** | |
| 3 | At translator associated with decoder under test —<br>Block operated TBL relay. | Minor alarm sounds.<br>At jack, key, and lamp circuit —<br>TR- lamp lights.<br>After timing period —<br>Major alarm sounds.<br>At decoder —<br>TA lamp lights. |
| 4 | Remove blocking tool from TBL relay. | At jack, key, and lamp circuit —<br>TR- lamp extinguishes. |
| 5 | At jack, key, and lamp circuit —<br>Momentarily operate TT-AR key. | Minor alarm silences. |
| 6 | At decoder —<br>Momentarily operate AR key. | Major alarm silences.<br>TA lamp extinguishes. |
| 7 | At translator —<br>Block operated CFTT relay. | |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 8 | Block nonoperated STM, TR relays. | |
| 9 | At decoder —<br>Block operated relays as indicated in line 1 of Table A. | At translater —<br>TBL relay operates. |

**TABLE A**

| LINE | RELAYS |
|---|---|
| 1 | OS, 1S |
| 2 | OS, 2S |
| 3 | 1S, 2S |
| 4 | 2S, NP, PF1 |
| 5 | 1S, NP, PF0 |
| 6 | OS, PF0, PF1 |
| 7 | OS, PF0, ZO |
| 8 | OS, PF1, ZO |

| | | |
|---|---|---|
| 10 | At decoder —<br>Remove blocking tools from relays of line 1 in Table A. | At translator —<br>TBL relay releases. |
| 11 | Repeat Steps 9, 10 for each remaining line in Table A. | |
| 12 | At decoder —<br>Block operated OS relay. | |
| 13 | Apply ground to TS(D) terminal of line 1 in Table B. | Register relay of line 1 in Table B operates.<br>At translator —<br>TBL relay operates. |
| 14 | At decoder —<br>Remove ground from TS(D) terminal of line 1 in Table B. | Register relay releases.<br>At translator —<br>TBL relay releases. |

**TABLE B**

| LINE | TERMINAL | RELAY |
|---|---|---|
| 1 | 15 | CC |
| 2 | 25 | CC1 |
| 3 | 44 | 7D |
| 4 | 54 | 10D |
| 5 | 56 | SDO |

| | | |
|---|---|---|
| 15 | Repeat Steps 13, 14 for each remaining line in Table B. | |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 16 | At decoder —<br>Remove blocking tool from OS relay. | |
| 17 | At translator —<br>Remove blocking tools from CFTT, STM, and TR relays. | |
| 18 | At decoder —<br>Apply ground to TS(A) terminals 42, 52 of Calling Line Class and Registration Unit. | CN relay operates.<br>Minor alarm sounds.<br>Major alarm sounds.<br>XL lamp lights. |
| 19 | Remove ground from TS(A) terminals 42, 52. | CN relay releases. |
| 20 | At jack, key, and lamp circuit —<br>Momentarily operate TT-AR key. | Minor alarm silences. |
| 21 | At decoder —<br>Momentarily operate AR key. | Major alarm silences.<br>XL lamp extinguishes. |
| 22 | Apply ground to TS(L) terminals 46, 56 of decoder control unit. | BSY relay operates.<br>Minor alarm sounds.<br>Major alarm sounds.<br>XL lamp lights. |
| 23 | Remove ground from TS(L) terminals 46, 56. | BSY relay releases. |
| 24 | At jack, key, and lamp circuit —<br>Momentarily operate TT-AR key. | Minor alarm silences. |
| 25 | At decoder —<br>Momentarily operate AR key. | Major alarm silences.<br>XL lamp extinguishes. |
| 26a | If no further tests are to be made —<br>At jack, key, and lamp circuit —<br>Remove make-busy plugs from TMB-, TTMB DR- jacks associated with decoder under test. | |
| | **B. Class-of-Service Cross Alarm and Recycle Control** | |
| 3 | At decoder under test —<br>Block operated TLC relay. | |
| 4 | Momentarily operate CL0, CN relays. | CL0, CN relays lock operated.<br>CLX relay operates.<br>Minor alarm sounds. |
| 5 | Remove blocking tool from TLC relay. | CL0, CN, CLX relays release. |
| 6 | At jack, key, and lamp circuit —<br>Momentarily operate TT-AR key. | Minor alarm silences. |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 7 | At translator —<br>Block operated 2TR relay. | |
| 8 | At decoder —<br>Block operated TLC relay. | |
| 9 | Momentarily operate CL9, CN relays. | CL9, CN relays lock operated.<br>CLT relay operates. |
| 10 | Remove blocking tool from TLC relay. | CN, CL9, CLT relays release. |
| 11 | Block operated TLC relay. | |
| 12 | At translator —<br>Momentarily operate WT relay. | At decoder —<br>CLT relay operates and locks. |
| 13 | At decoder —<br>Block operated TSTB relay. | At translator —<br>RCY1 relay operates. |
| 14 | At decoder —<br>Remove blocking tools from TSTB, TLC relays. | CLT relay releases.<br>At translator —<br>RCY1 relay releases. |
| 15 | Remove blocking tool from 2TR relay. | |
| 16a | If no further tests are to be made —<br>At jack, key, and lamp circuit —<br>Remove make-busy tools from TMB-, TTMB DR- jacks associated with decoder under test. | |

### C. Transmitted Information Check and Crossed Transmitting Leads Alarm

| | | |
|---|---|---|
| 3 | At decoder under test —<br>Apply resistance (2500 ohms) battery to fixed contact of RH relay as indicated in line 1 of Table C. | Check relay does not operate. |
| 4 | Remove battery from fixed contact of line 1 in Table C. | |

**TABLE C**

| LINE | RELAY | CONTACT | CHECK RELAY |
|---|---|---|---|
| 1 | RH | 1F | ARK1 |
| 2 | RH | 2F | ARK2 |
| 3 | RH | 3F | BRK1 |
| 4 | RH | 4F | BRK2 |
| 5 | RH | 5F | CRK1 |
| 6 | RH | 6F | CRK2 |
| 7 | RH | 7F | DRK1 |
| 8 | RH | 8F | DRK2 |
| 9 | RH | 9F | ERK1 |
| 10 | RH | 10F | ERK2 |
| 11 | RH | 11F | FRK1 |
| 12 | RH | 12F | FRK2 |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 5 | Repeat Steps 3, 4 for each remaining line of Table C. | |
| 6 | Block operated relay specified in line 1 of Table D. | |
| 7 | Apply resistance (640 ohms) battery to fixed contact of relay specified in line 1 of Table D. | Check relay does not operate. |
| 8 | Remove battery from contact of line 1 in Table D. | |
| 9 | Remove blocking tool, if used. | |

**TABLE D**

| LINE | BLOCK RELAY | RELAY | CONTACT | CHECK RELAY |
|---|---|---|---|---|
| 1 | | RH | 13F | DLK |
| 2 | RVT | RVT | 10F | PCK |
| 3 | ARA | ARA | 10F | ARAK |
| 4 | | 10D | 11F | DGK |

| | | |
|---|---|---|
| 10 | Repeat Steps 6 through 9 for each remaining line of Table D. | |
| 11 | Block operated TKB relay. | |
| 12 | Momentarily apply ground to fixed contact of RH relay as specified in line 1 of Table C. | Check relay operates. |
| 13 | Repeat Step 12 for each remaining line in Table C. | |
| 14 | Block operated relay specified in line 1 of Table D. | |
| 15 | Momentarily apply ground to fixed contact specified in line 1 of Table D. | Check relay operates. |
| 16 | Repeat Steps 14, 15 for each remaining line of Table D. | |
| 17 | Remove blocking tool from TKB relay. | Check relays release. |
| 18 | Remove blocking tools from RVT, ARA relays. | |
| 19 | Momentarily apply ground to 10F of RVT relay. | Minor alarm sounds.<br>Major alarm sounds.<br>X lamp lights. |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 20 | At jack, key, and lamp circuit — Momentarily operate TT-AR key. | Minor alarm silences. |
| 21 | At decoder — Momentarily operate AR key. | Major alarm silences. X lamp extinguishes. |
| 22 | Block nonoperated TS relay. | |
| 23 | Momentarily apply ground to 10F of DPC relay. | XTL3 relay operates. |
| 24 | Momentarily operate AR key. | XTL3 relay releases. |
| 25 | Repeat Steps 23, 24 for SDR, SG relays. | |
| 26 | Momentarily apply ground to fixed contact of TLC- relay specified in line 1 of Table E. | XTL- relay specified in line 1 of Table E operates. |

**TABLE E**

| LINE | TLC- RELAY | CONTACT | LEAD CHECKED | XTL- RELAY |
|---|---|---|---|---|
| 1 | TLC1 | 1F | AR0 | XTL1 |
| 2 | ↑ | 2F | AR1 | ↑ |
| 3 | ↑ | 3F | AR2 | ↑ |
| 4 | ↑ | 4F | AR4 | ↑ |
| 5 | ↑ | 5F | AR7 | ↑ |
| 6 | ↑ | 7F | BR0 | ↑ |
| 7 | ↑ | 8F | BR1 | ↑ |
| 8 | ↑ | 9F | BR2 | ↑ |
| 9 | ↑ | 10F | BR4 | ↑ |
| 10 | ↑ | 11F | BR7 | ↑ |
| 11 | TLC1 | 12F | BR10 | ↑ |
| 12 | TLC2 | 1F | CR0 | ↑ |
| 13 | ↑ | 2F | CR1 | ↑ |
| 14 | ↑ | 3F | CR2 | ↑ |
| 15 | ↑ | 4F | CR4 | ↑ |
| 16 | ↑ | 5F | CR7 | ↑ |
| 17 | ↑ | 6F | CR10 | XTL1 |
| 18 | ↑ | 7F | DR0 | XTL2 |
| 19 | ↑ | 8F | DR1 | ↑ |
| 20 | ↑ | 9F | DR2 | ↑ |
| 21 | ↑ | 10F | DR4 | ↑ |
| 22 | ↑ | 11F | DR7 | ↑ |
| 23 | TLC2 | 12F | DR10 | XTL2 |

| STEP | ACTION | VERIFICATION |
|---|---|---|

**TABLE E (Cont)**

| LINE | TLC- RELAY | CONTACT | LEAD CHECKED | XTL- RELAY |
|---|---|---|---|---|
| 24 | TLC3 | 1F | ER0 | XTL2 |
| 25 | ↑ | 2F | ER1 | ↑ |
| 26 | \| | 3F | ER2 | \| |
| 27 | \| | 4F | ER4 | \| |
| 28 | \| | 5F | ER7 | \| |
| 29 | \| | 7F | FR0 | \| |
| 30 | \| | 8F | FR1 | \| |
| 31 | \| | 9F | FR2 | \| |
| 32 | ↓ | 10F | FR4 | ↓ |
| 33 | TLC3 | 11F | FR7 | XTL2 |
| 34 | TLC4 | 1F | DL1 | XTL3 |
| 35 | ↑ | 2F | DL2 | ↑ |
| 36 | \| | 3F | DL3 | \| |
| 37 | \| | 4F | DL6 | \| |
| 38 | \| | 5F | DAD | \| |
| 39 | \| | 7F | 3DG | \| |
| 40 | \| | 8F | 4DG | \| |
| 41 | TLC4 | 9F | 5DG | XTL3 |

| | | |
|---|---|---|
| 27 | Momentarily operate AR key. | XTL- relay releases. |
| 28 | Repeat Steps 26, 27 for each remaining line of Table E. | |
| 29a | If no further tests are to be made — At jack, key, and lamp circuit — Remove make-busy plugs from TMB-, TTMB DR- jacks associated with decoder under test. | |

### D. Crossed Cancel Alternate Route

***Caution: Before making Test D, consult with the Traffic Department in accordance with local instructions. Apply Test D only to CAR- relays associated with CAR- keys that are normal.***

| | | |
|---|---|---|
| 3 | At decoder under test — Momentarily operate CAR0 relay. | XCAR, COX relays operate.<br>Minor alarm sounds.<br>Major alarm sounds.<br>X lamp lights. |
| 4 | At jack, key, and lamp circuit — Momentarily operate TT-AR key. | Minor alarm silences. |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 5 | At decoder —<br>Momentarily operate AR key. | Major alarm silences.<br>X lamp extinguishes.<br>XCAR, COX relays release. |
| 6 | Block nonoperated TS relay. | |
| 7 | Momentarily operate CAR1 relay. | XCAR relay operates.<br>Major alarm sounds. |
| 8 | Momentarily operate AR key. | Major alarm silences.<br>XCAR relay releases. |
| 9 | Insulate 2M of XCAR relay. | |
| 10 | Momentarily operate CAR2 relay. | XCAR relay operates. |
| 11 | Momentarily operate AR key. | XCAR relay releases. |
| 12 | Repeat Steps 10, 11 to test other CAR- relays and associated keys. | |
| 13 | Remove blocking and insulating tools from TS, XCAR relays. | |
| 14a | If no further tests are to be made —<br>At jack, key, and lamp circuit —<br>Remove make-busy tools from TMB-, TTMB DR- jacks associated with decoder under test. | |

### E. Foreign Area Translator Seizure and Trouble Alarm

| | | |
|---|---|---|
| 3 | At translator associated with decoder under test —<br>Block nonoperated STM, TR relays.<br><br>***Caution: When insulating movable springs of wire-spring relays, use care not to dislodge the movable spring from the groove of the comb.*** | |
| 4 | At decoder under test —<br>Insulate 3M, 5M of ON relay. | |
| 5 | Block operated ON relay. | |
| 6 | Apply ground to TS(DB) terminal FA0. | FA0 relay operates.<br>CAK relay does not operate. |
| 7 | Apply resistance (640 ohms) battery to TS(A) terminal 36. | CAK relay does not operate. |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 8 | Remove battery from TS(A) terminal 36. | |
| 9 | Apply ground to TS(A) terminal 36. | CAK relay operates. |
| 10 | Remove ground from TS(DB) terminal FA0. | FA0 relay releases. |
| 11 | Block operated OS relay. | At translator —<br>TBL relay releases. |
| 12 | At decoder —<br>Remove blocking tool from OS relay. | At translator —<br>TBL relay releases. |
| 13 | At decoder —<br>Block operated 1S relay. | LFA relay operates. |
| 14 | Momentarily operate FA0 relay. | FA0 relay locks operated.<br>FAT relay operates. |
| 15 | Momentarily operate FA4 relay. | FA4 relay locks operated.<br>FAT relay releases.<br>At translator —<br>TBL relay operates. |
| 16 | At decoder —<br>Remove ground from TS(A) terminal 36. | CAK relay releases. |
| 17 | Remove blocking tools from ON, 1S relays. | LFA, FA0, FA4 relays release.<br>At translator —<br>TBL relay releases. |
| 18 | At decoder —<br>Remove insulating tools from ON relay. | |
| 19 | At translator —<br>Remove blocking tools from STM, TR relays. | |
| 20a | If no further tests are to be made —<br>At jack, key, and lamp circuit —<br>Remove make-busy tools from<br>TMB-, TTMB DR- jacks associated with decoder under test. | |