
E2 STATUS REPORTING AND CONTROL SYSTEM
TROUBLESHOOTING PROCEDURES
STATUS REPORTING REMOTE

This section contains step-by-step procedures to be performed on E2 status reporting remotes to determine the nature and location of a problem(s). This procedure should not be started until the E2 Initial System Diagnosis, Section 201-644-501, has been gone through and indications are that the E2 remote is suspected to be defective.

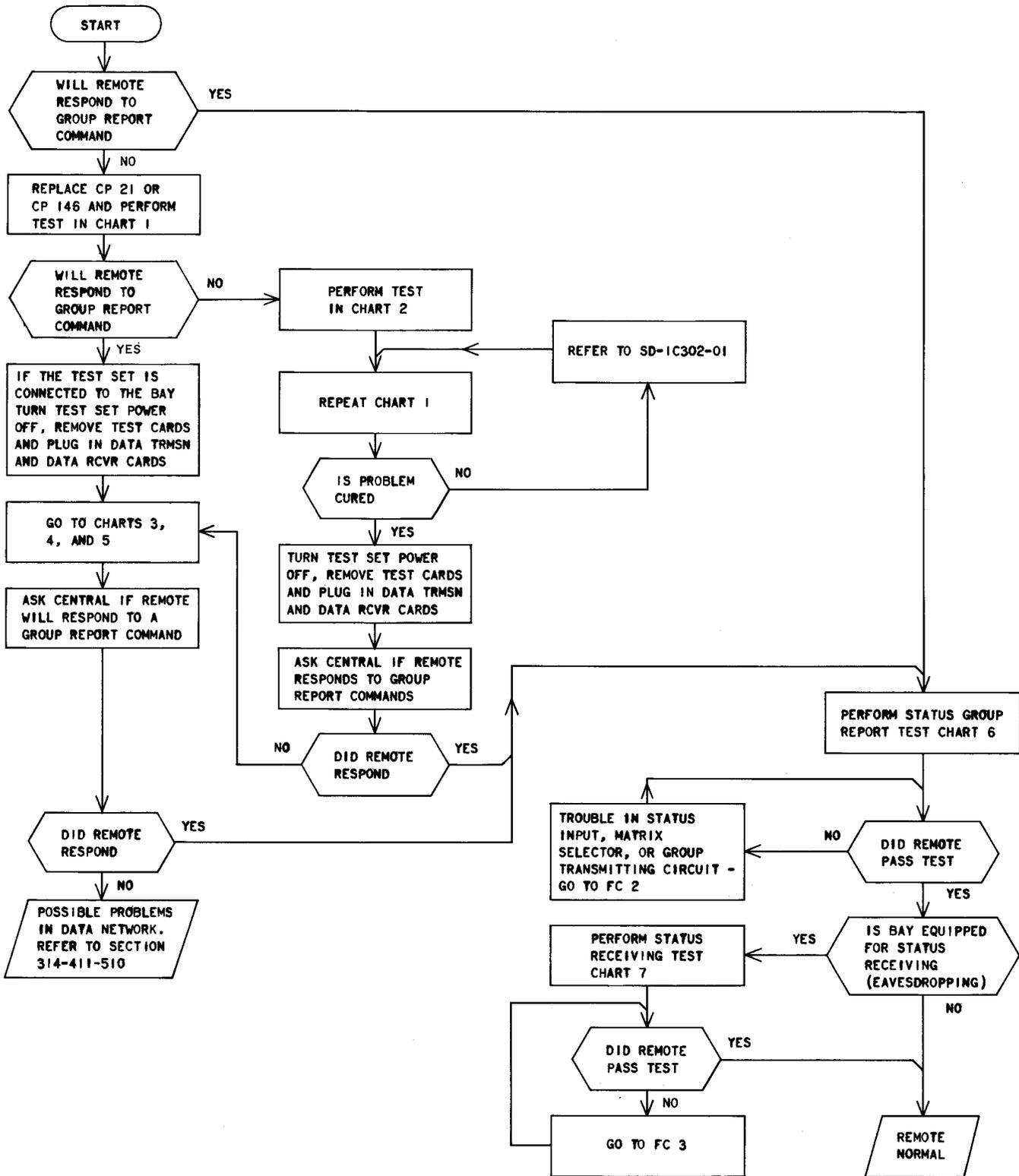
Start with Flowchart 1 and proceed as directed to the appropriate chart. Charts 2 through 5 are used independently to test and repair the *common control* logic (the Data Transmission circuit and the Data Transmission Control (DTC) circuit). Chart 1 is used to determine if the remote will group report. If it will not group report, proceed to Charts 2 through 5. If it will group report, proceed to Chart 6. Chart 6 is used in two ways: (1) to determine if the circuitry performs correctly, and (2) together with Flowchart 2 to test and repair that circuitry. Chart 7 and Flowchart 3 are used to test and repair the receiving circuitry.

The reference to an SD on a flowchart represents the necessity to leave this section, as the problem is not due to a faulty circuit pack (CP). When this occurs, visually inspect the wiring, connectors, and terminal blocks for physical damage. If no damage is found, troubleshoot the remote using the CDs, SDs and appropriate test equipment as required.

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NOTICE

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Flowchart 1—Initial Diagnoses

CHART 1
INITIAL TEST

APPARATUS:

E-Telemetry Station Test Set (KS-20937-L1)

General Purpose Plug-In (KS-20937-L4)

E1/E2 Test Cable (KS-20937-L5)

STEP
PROCEDURE

- 1 Set the station test set switches to the following positions:

<u>SWITCH</u>	<u>POSITION</u>
SYSTEM	E1/E2
PARITY	B
BIT RATE	150 (If equipped with CP 87) 600 (If equipped with CP 88)
MODE	ONCE
ENABLE	NORMAL
DISPLAY ERROR WORD	OFF
DISPLAY WORD SELECT	1
POWER	OFF
RCU	OFF
MESSAGE LENGTH	1
WORD 1 through WORD 4	0000000000000000

- 2 Plug the station test set into a 110 Vac outlet.
- 3 Connect the E1/E2 test cable to the test set.
- 4 Remove the Data Transmitter CP (in location 1-1/D) and Data Receiver CP (in location 1-1/B) from the E2 bay.
- 5 Insert the test connection cards in the appropriate slots. *Do not seat cards.*
- 6 Set the test set POWER switch to the ON position.

CHART 1 (Cont)

STEP	PROCEDURE
7	Depress the INDICATOR TEST pushbutton. <i>Requirement:</i> All the RECEIVE indicator lamps shall light. Failure of any or all lamps to light indicates test set problems.
8	Depress the MASTER CLEAR pushbutton. <i>Requirement:</i> All the RECEIVE indicator lamps shall extinguish. Failure of all lamps to extinguish indicates test set problems.
9	Seat the test connector cards.
10	Determine the remote bay address, and set the appropriate switches in WORD 1 in the 1 (up) position (see Table A).
11	Set switch 2 of WORD 1 in the 1 (up) position.
12	Depress the START pushbutton. <i>Requirement:</i> The RCV and VALID WORD indicator lamps shall blink. If the requirement is met, the remote responds to the group report command.
13	Return to Flowchart 1.

CHART 2
DATA TRANSMISSION CONTROL (DTC) CIRCUIT TEST

APPARATUS:

Oscilloscope, Tektronix 453, or equivalent

Volt-Ohm Milliammeter (VOM), KS-14510-L1, or equivalent

Spare Circuit Packs

STEP	PROCEDURE
1	Remove the data transmission circuit CPs (and test set connector cards, if present) located in slots 1-1/A, 1-1/B, 1-1/C, and 1-1/D.

CHART 2 (Cont)

STEP	PROCEDURE
2	Ground pin 16 (RD lead) of CP 93.
3	Remove CP 29. <i>Note:</i> E2 logic levels are as follows: Logic 1 = 0 to +0.35 Vdc Logic 0 = +5 to +24 Vdc
4	Check the test points in Table B with a VOM or oscilloscope, in the order shown, for the desired logic level. Replace the defective CPs with spares.
5	Replace the CPs removed in Steps 1 and 3, and remove the ground from pin 16 on CP 93.
6	Return to Flowchart 1.

CHART 3**OPERATIONAL TEST OF THE DATA TRANSMISSION CIRCUIT****APPARATUS:**

21A Transmission Measuring Set (TMS)

Volt-Ohm-Milliammeter (VOM), KS-14510-L1, or equivalent

Oscilloscope, Tektronix 453, or equivalent

Vacuum Tube Voltmeter (VTVM), Hewlett-Packard 400D, or equivalent

Before any tests of the data transmission circuit are initiated, all ports of the line unit not utilized during the test must be terminated with 262B plugs to prevent transmission into the data network. If CP 119 is used, **do not** terminate those bridge ports already terminated via straps (refer to SD-1C301-01, FS1, FS3). All VF jacks must also be terminated with 262B plugs to properly terminate the data facility. It is essential that a circuit release be obtained from the network control office before any terminations are made or tests performed.

A transmission level diagram is shown in Fig. 2 and should be referred to during the performance of any test or alignment procedure. All tests at unbalanced test points (TPs) should be made with an HP-400D VTVM, or equivalent. It should be noted that the E2 data set operates at a data signal level of -13 dBm0; that is, at any given transmission level point (TLP), the data signal power is 13

CHART 3 (Cont)

dB less than the specified TLP value. This is an important point in that *all tests must be performed at data level and not TLP level.*

Table C summarizes the frequencies utilized in the E2 data sets and will be referred to in the following step-procedure tests.

STEP	PROCEDURE
1	Apply a space-frequency tone (see Table C), using a 21A TMS or equivalent, at a level of -13 dBm0 to the BR2 IN (AMP IN)* jack.
2	Monitor TP 8 (RD lead) of the data receiver (CP 224, 227, 228, or 229) using either a KS-14510-L1 VOM, or equivalent. Requirement: The voltage shall be greater than $+12$ Vdc.
3	Remove the space frequency tone. Requirement: The voltage at TP 8 shall be less than $+0.5$ Vdc.
4	Reapply the space-frequency tone. Requirement: The voltage at TP 8 shall return to greater than $+12$ Vdc.
5	Change the oscillator frequency to a mark tone. Requirement: The voltage at TP 8 should shift to less than $+0.5$ Vdc.
6	If the data set fails any of the preceding tests, replace the circuit packs in the order listed below, rechecking Steps 2, 3, and 4 after each substitution. <ul style="list-style-type: none"> <li data-bbox="342 1465 857 1493">● Data Receiver (CP 224, 227, 228, or 229) <li data-bbox="342 1528 678 1556">● Receiver Control (CP 218) <li data-bbox="342 1623 743 1650">● Line Unit (CP 118, 119, or 120)
7	Connect the 21A detector input to the BR2 OUT (AMP OUT)* jack and plug a monitor receiver into the 21A monitor jack.

* Bracketed designations refer to jacks associated with CP 118 or CP 120.

CHART 3 (Cont)

STEP	PROCEDURE
8	If equipped for loopback, operate the loopback key and proceed with Step 10.
9	If not equipped for loopback, disconnect the 21A oscillator from the line unit input. Ground TP 1 on CP 93, located in the data transmission control circuit. Remove CP 94, located in the data transmission control circuit.
10	Observe the output level on the 21A TMS. <i>Requirement:</i> If CP 118 or CP 119 is present, the level shall be approximately -29 dBm; if CP 120 is present, the level shall be approximately 0 dBm.
11	If the data set fails Step 10, replace the circuit pack in the order listed below, rechecking Step 10 after each substitution. <ul style="list-style-type: none"> <li data-bbox="440 877 992 905">● Data Transmitter (CP 124, 127, 128, or 129) <li data-bbox="440 940 841 968">● Line Unit (CP 118, 119, or 120)
12	If equipped for loopback, change the 21A oscillator to the space frequency. <i>Requirement:</i> The tone heard on the monitor receiver will be the space frequency.
13	If not equipped for loopback, reinsert CP 94. <i>Requirement:</i> The tone heard on the monitor receiver will periodically shift between mark and space, resulting in a chirping sound. <i>Note:</i> If the operational test outlined above proves good, there is reasonable assurance that the CPs comprising the data set are good; however, this check is by no means comprehensive and serves only to prevent attempts to check or perform level and threshold alignment with a dead data set. Once the operational test has been made and it has been determined that the data set is not dead, proceed with the alignment test in Chart 4.

CHART 4
ALIGNMENT TEST OF THE DATA TRANSMISSION CIRCUIT

APPARATUS:

21A Transmission Measuring Set (TMS)

Volt-Ohm-Milliammeter (VOM), KS-14510-L1, or equivalent

Oscilloscope, Tektronix 453, or equivalent

CHART 4 (Cont)

STEP

PROCEDURE

- 1 Using a 21A TMS, or equivalent, apply a -13 dBm0 tone to the BR2 IN (AMP IN)* jack.

Note: If the voiceband data set is being tested, the frequency shall be 1300 Hz; if a telegraph channel data set is being tested, the frequency will be the space frequency (see Table C).
- 2 Observe the signal at TP 14 on CP 118, 119 or 120.

Requirement: The signal level shall be -11 ± 0.5 dBm.
- 3 Monitor TP 3 on CP 218 with a KS-14510-L1 VOM, or an oscilloscope. If available, the oscilloscope should be used.

Requirement: The voltage at TP3 shall be less than ± 0.5 Vdc.
- 4 Decrease the input signal level until TP 3 on CP 218 shifts to greater than $+12$ Vdc. Vary the level by a small amount to determine the exact level at which the shift occurs. The level at which the shift occurs is the data set threshold and is defined as -26 dBm0 for CP 224 and CP 229 and as -30 dBm0 for CP 227 and CP 228. The threshold levels for the associated CPs are given below.

Requirement:

<u>LINE UNIT</u>	<u>THRESHOLD CP 224, CP 229</u>	<u>THRESHOLD CP 227, CP 228</u>
CP 118, CP 119	-19 ± 0.5 dBm	-23 ± 0.5 dBm
CP 120	-29 ± 0.5 dBm	-33 ± 0.5 dBm

- 5 Connect the 21A detector input to the BR2 OUT (AMP OUT)* jack.
- 6 If equipped for loopback, operate the loopback key.
- 7 If not equipped for loopback, ground TP 1 on CP 93 located in the DTC circuit. Remove CP 94.
- 8 Observe the signal level at TP 1 on CP 124, 127 or 128, or TP 6 on CP 129 of the data transmitter.

Requirement: The signal level shall be -15 ± 0.5 dBm.

* Bracketed designations refer to jacks associated with CP 118 or CP 120.

CHART 4 (Cont)

STEP	PROCEDURE
9	Observe the signal level at the BR2 OUT (AMP OUT)* jack. Requirement: The level shall be -29 ± 0.5 dBm for CP 118 or CP 119, or 0 ± 0.5 dBm for CP 120. Note: If the above voltage levels and signal levels are within the limits outlined above, the data set is in proper alignment. If any of the above requirements are not met, alignment of the data set must be performed as set forth in Chart 5 (Alignment Procedure for the Data Transmission Circuit).

CHART 5**ALIGNMENT PROCEDURE FOR THE DATA TRANSMISSION CIRCUIT****APPARATUS:**

- 21A Transmission Measuring Set (TMS)
 - Frequency Counter, Hewlett-Packard (HP) 5233L, or equivalent
 - Vacuum Tube Voltmeter (VTVM), Hewlett-Packard 400D, or equivalent
 - Volt-Ohm-Milliammeter (VOM), KS-14510-L1, or equivalent
 - Oscilloscope, Tektronix 453, or equivalent
-

STEP	PROCEDURE
1	Remove the DTC circuit fuses (F2, F7, and F18); then remove CP 93 and reinsert the fuses.
2	Using a 21A TMS, or equivalent, apply a -13 dBm0 tone to the BR2 IN (AMP IN)* jack. Note: If the voiceband data set is being tested, the frequency will be 1300 Hz; if one of the telegraph channel data sets is being tested, the frequency will be the space frequency (see Table C).

* Bracketed designations refer to jacks associated with CP 118 or CP 120.

CHART 5 (Cont)

- | STEP | PROCEDURE |
|------|--|
| 3 | If a telegraph channel is being tested, connect an HP-5233L frequency counter, or equivalent, to TP 14 of the line unit, and adjust the 21A oscillator to within 1 Hz of the space frequency. If the voiceband data set is being tested, the frequency may be read directly from the oscillator dial. |
| 4 | Connect an HP-400D VTVM, or equivalent, to TP 14 on CP 118, 119, or 120, and observe the signal level.

Requirement: The signal level shall be -11 ± 0.5 dBm. |
| 5 | If the above requirement is not met, adjust R3 on CP 119, or R2 on CP 118, or CP 120 for the required level. |
| 6 | Connect the HP-400D VTVM to TP 13 on CP 229, or TP 14 on CP 224, 227 or 228 and note signal level. Change the frequency of the 21A oscillator to the space frequency (CP 229) or to the mark frequency for CP 224, 227 or 228.

Requirement: The signal level at the mark and space frequencies shall not differ by more than 2 dB. If this requirement is not met, the data receiver must be replaced and Step 6 repeated. |
| 7 | Adjust the 21A TMS as indicated below. |

RECEIVER	FREQUENCY*	SIGNAL LEVEL	
		CP 118 or 119	CP 120
CP 229	Mark	-18 dBm	-28 dBm
CP 224	Space	-18 dBm	-28 dBm
CP 227 or 228	Space	-22 dBm	-32 dBm

* See Table C

- | | |
|----|--|
| 8 | Connect the KS-14510-L1 VOM, or oscilloscope, to TP 3 on CP 218.

Requirement: The voltage shall be less than +0.5 Vdc. If the voltage is +12 Vdc or more, <i>omit</i> Step 9 and proceed to Step 10. |
| 9 | Decrease the oscillator output level in 0.2-dB steps. When the level has been decreased 1 ± 0.4 dB, the voltage at TP 3 on CP 218 shall shift to greater than +12 Vdc. |
| 10 | If either of the two preceding requirements are not met, set the oscillator output level 1 dB below that specified in Step 7, and adjust potentiometer R5 on CP 218 so that the voltage at TP 3 shifts low. Repeat Steps 7 through 9 to verify the adjustment. |

CHART 5 (Cont)

STEP	PROCEDURE
11	If the requirements in Steps 7 through 10 cannot be met following the adjustment, replace CP 218 and repeat Steps 7 through 10.
12	Increase the output level of the 21A oscillator to -16 dBm, and adjust the frequency to the space frequency (see Table C).
13	Connect the KS-14510-L1 VOM, or an oscilloscope, to TP 8 on the data receiver, and observe the voltage at that point. Requirement: The voltage shall be greater than $+12$ Vdc.
14	Change the oscillator frequency to the mark frequency, and observe that the voltage at TP 8 on the data receiver shifts to less than $+0.5$ Vdc.
15	Slowly change the oscillator frequency from the mark to the space frequency, and observe that the voltage at TP 8 on the data receiver shifts to $+12$ Vdc at the midband frequency ± 5 Hz. If the voiceband data set is being tested, the shift shall occur at 1750 ± 20 Hz. For narrowband data sets (see Table C).
16	If the voltage shift in Step 15 does not occur at the correct frequency, adjust potentiometer R23 on CP 224, 227 or 228, or potentiometer R21 on CP 229 until the voltage shift occurs at the correct frequency. Note: This adjustment is very sensitive near threshold and requires very little movement of the potentiometer. When adjusting the voiceband data receiver, several attempts may be required before proper adjustment is attained.
17	Connect the HP-400D VTVM to TP 6 on CP 129, or TP 1 on CP 124, 127 or 128. Connect the 21A TMS detector input to the line unit output, and plug a monitor receiver into the 21A monitor jack.
18	If the data set is equipped for loopback, perform Steps 20 through 26.
19	If the data set <i>is not</i> equipped for loopback, omit Steps 20 through 25 and perform Steps 26 through 31.
20	Operate the loopback key, and adjust the 21A TMS to the space frequency (see Table C).
21	Observe the signal level indicated on the VTVM, and note that the one heard on the monitor is the space frequency. Requirement: The signal level read on the VTVM shall be -15 ± 1 dBm.
22	If the requirement is not met, adjust potentiometer R25 on CP 129, or potentiometer R14 on CP 124, 127 or 128 so that the level is -15 ± 1 dBm.

CHART 5 (Cont)

STEP	PROCEDURE
23	Change the 21A TMS oscillator to the mark frequency (see Table C). Requirement: The signal level indicated on the VTVM shall be -15 ± 1.5 dBm. The tone heard on the monitor shall be the mark frequency. If this requirement is not met, the data transmitter CP must be replaced.
24	Change the 21A TMS oscillator back to the space frequency, and observe the signal level indicated on the 21A TMS detector. Requirement: The signal level shall be -29 ± 0.5 dBm for CP 118, or CP 119 and 0 ± 0.5 dBm for CP 120. If necessary, adjust potentiometer R6 on CP 118 or CP 120, or potentiometer R5 on CP 119 to meet this requirement.
25	Release the loopback key, and remove all test connections and terminations.
26	Remove the DTC circuit fuses (F2, F7, and F18). Reinsert CP 93, and then reinsert the fuses.
27	Remove CP 94 and ground TP 1 on CP 93 (both CPs are located in the DTC circuit).
28	Observe the signal level indicated on the VTVM and that the tone heard on the monitor is the mark frequency. Requirement: The signal level shall be -15 ± 1 dBm. If necessary, adjust potentiometer R25 on CP 129, or R14 on CP 124, 127 or 128 so that the level is -15 dBm.
29	Observe the signal level indicated on the 21A TMS detector. Requirement: The signal level shall be -29 ± 0.5 dBm for CP 118 or CP 119, or 0 ± 0.5 dBm for CP 120. If necessary, adjust potentiometer R6 (CP 118 or CP 120) or R5 (CP 119) for the required output level.
30	Reinsert CP 94 and note that the output oscillates near -29 dBm. The extremes shall not exceed -29 ± 1 dBm. If this requirement is not met, the data transmitter CP must be replaced.
31	Remove the ground from TP 1 on CP 93 and all test connections and terminations.

CHART 6
STATUS GROUP REPORT TEST

APPARATUS:

E-Telemetry Station Test Set (KS-20937-L1)

General Purpose Plug-In (KS-20937-L4)

E1/E2 Test Cable (KS-20937-L5)

STEP**PROCEDURE**

-
- 1 Set the station test set switches to the following positions:

<u>SWITCH</u>	<u>POSITION</u>
SYSTEM	E1/E2
PARITY	B
BIT RATE	150 (If equipped with CP 87) 600 (If equipped with CP 88)
MODE	ONCE
ENABLE	NORMAL
DISPLAY ERROR WORD	ON
DISPLAY WORD SELECT	1
POWER	OFF
RCU	OFF
MESSAGE LENGTH	1
WORD 1 through WORD 4	0000000000000000

- 2 Plug the station test set into a 110 Vac outlet.
- 3 Connect the E1/E2 test cable to the test set.
- 4 Remove the Data Transmitter CP (in location 1-1/D) and Data Receiver CP (in location 1-1/B) from the E2 bay.
- 5 Insert the test connection cards in the appropriate slots. *Do not seat cards.*
- 6 Set the test set POWER switch to the ON position.

CHART 6 (Cont)

STEP	PROCEDURE
7	Depress the INDICATOR TEST pushbutton. Requirement: All the RECEIVE indicator lamps shall light. Failure of any or all lamps to light indicates test set problems.
8	Depress the MASTER CLEAR pushbutton. Requirement: All the RECEIVE indicator lamps shall extinguish. Failure of all lamps to extinguish indicates test set problems.
9	Seat the test connector cards.
10	Determine the number of groups for which the bay is wired and the number of subgroups (1-16) in each group.
11	Determine the remote bay address, and set the appropriate switches in WORD 1 in the 1 (up) position (see Table A).
12	Set switch 2 of WORD 1 in the 1 (up) position.
13	Depress the START pushbutton. Requirement: The VALID WORD and RCV indicator lamps shall blink. The ERROR indicator lamp shall not light.
14	Set WORD 1 switches to the position stated in Table D for group number 2.
15	Depress the START pushbutton. Requirement: The VALID WORD and RCV indicator lamps shall blink. The ERROR indicator lamp shall not light.
16	Repeat the procedure used in Steps 14 and 15 for each remaining group contained in the bay.
17	Set WORD 1 switches to the correct positions for the first group in the bay.
18	Set the DISPLAY WORD SELECT switch to 16.
19	Depress the START pushbutton. Requirement: The VALID WORD and RCV indicator lamps shall blink. The ERROR indicator lamp shall not light. If the ERROR WORD indicator lights, repeat Step 19. If the indicator lights again, all of the even subgroups are not being reported. To determine which ones are not reporting, set the DISPLAY WORD SELECT switch to each even-numbered

CHART 6 (Cont)

STEP	PROCEDURE
	subgroup and repeat Step 17. Record each subgroup for which the ERROR WORD indicator lights.
20	Set the DISPLAY WORD SELECT switch to 15, and repeat Step 19 for the odd subgroups.
21	Repeat Steps 17 through 20 for each group.
22	Select one even and one odd subgroup within any group and ground all the status input points corresponding to those subgroups.
23	Set the switches in WORD 1 to the position shown in Table D, corresponding to the group chosen in Step 22.
24	Set the DISPLAY WORD SELECT switch to the number corresponding to the even subgroup chosen in Step 22.
25	Depress the START pushbutton.
	Requirement: All RECEIVE-INFORMATION indicator lamps, corresponding to the grounded status input points shall light.
26	Set the DISPLAY WORD SELECT switch to the number corresponding to the odd subgroup chosen in Step 22.
27	Depress the START pushbutton.
	Requirement: All RECEIVE-INFORMATION indicator lamps corresponding to the grounded status input points shall light.
28	Remove all grounds placed on in Step 22.
29	Repeat Steps 24 through 27.
	Requirement: No RECEIVE-INFORMATION indicator lamps shall light.
30	If all the requirements in the test are met, return to Flowchart 1. If one or more of the requirements are not met, proceed to Flowchart 2, and perform the indicated maintenance.

CHART 7

STATUS RECEIVING (EAVESDROPPING) TEST

APPARATUS:

E-Telemetry Station Test Set (KS-20937-L1)

General Purpose Plug-In (KS-20937-L4)

E1/E2 Test Cable (KS-20937-L5)

STEP

PROCEDURE

1 Set the station test set switches to the following positions:

<u>SWITCH</u>	<u>POSITION</u>
SYSTEM	E1/E2
PARITY	B
BIT RATE	150 (If equipped with CP 87) 600 (If equipped with CP 88)
MODE	ONCE
ENABLE	NORMAL
DISPLAY ERROR WORD	OFF
DISPLAY WORD SELECT	1
POWER	OFF
RCU	OFF
MESSAGE LENGTH	1
WORD 1	0100000000000000
WORD 2 through WORD 4	0000000000000000

2 Set WORD 1 switches 4 through 8 to the correct positions for station address 111 (see Table A).

3 Set WORD 1 switches 2 and 14 through 17 for group 1 (see Table D).

4 Depress, in order, the MASTER CLEAR and START pushbutton.

5 Set the MESSAGE LENGTH WORDS switch to 16.

CHART 7 (Cont)

STEP	PROCEDURE
6	Set WORD 1 through WORD 4 switches to positions 1000000000000000.
7	Depress the START pushbutton. <i>Requirement:</i> The office indicators shall show no statuses.
8	Set WORD 1 switches for each remaining group (see Table D) and repeat Steps 4 through 7 for each setting.
9	Set WORD 1 switches for each remaining station (see Table A) on the data network, and repeat Steps 4 through 8 for each setting.
10	Set all switches in WORD 1 through WORD 4 in the 1 (up) position, and repeat Steps 4 through 9. <i>Requirement:</i> All office indicators shall show a status.
11	Return to Flowchart 1.

TABLE A
STATION ADDRESS INDICATORS

STATION ADDRESS	WORD 1 SWITCH NUMBERS			
	4	5	6	7
111	0	0	0	0
112	1	0	0	0
113	0	1	0	0
114	1	1	0	0
115	0	0	1	0
116	1	0	1	0
117	0	1	1	0
118	1	1	1	0
121	0	0	0	1
122	1	0	0	1
123	0	1	0	1
124	1	1	0	1
125	0	0	1	1
126	1	0	1	1
127	0	1	1	1
128	1	1	1	1

LEGEND:
1 - LIGHTED LAMP
0 - EXTINGUISHED LAMP

TABLE B
DTC LOGIC LEVELS

CIRCUIT PACK	DESIG	LOGIC LEVEL	TEST POINTS	REPLACED IN ORDER LISTED IF LOGIC LEVELS ARE INCORRECT				
				1	2	3	4	5
93	Clock Pulse 1,2,3,4	As Indicated In Fig. 1	Punchings* 1,3,5,7	87 OR 88	93			
92	C0,C1,C2 C3,C4	0	10,7,4 6,14	92	93			
93	RCV	0	14	93	96			
93	\overline{RC}	1	13	93				
93	WR	0	12	93				
93	TMT	0	1	93	96	81 OR 147†	8,15, OR 131†	21 OR 146†
90	IS	0	5	96				
94	TD	1	3	94	93			
96	CK	0	8	96				
96	ADV	0	3	96				
96	\overline{INH}	1	12	96				
96	$\overline{C31}$	1	5	96				
96	SCL	0	2	96				
95	P7,P6,P5 P4,P3,P2 P1	0	1,2,3,4 5,6,13	95	96			
2	\overline{ME}	1	1	2	93			
2	$\overline{NOT ME}$	1	9	2	93			
2	LF2	0	13	2	93			

* On 908C Card Connector

† As Equipped

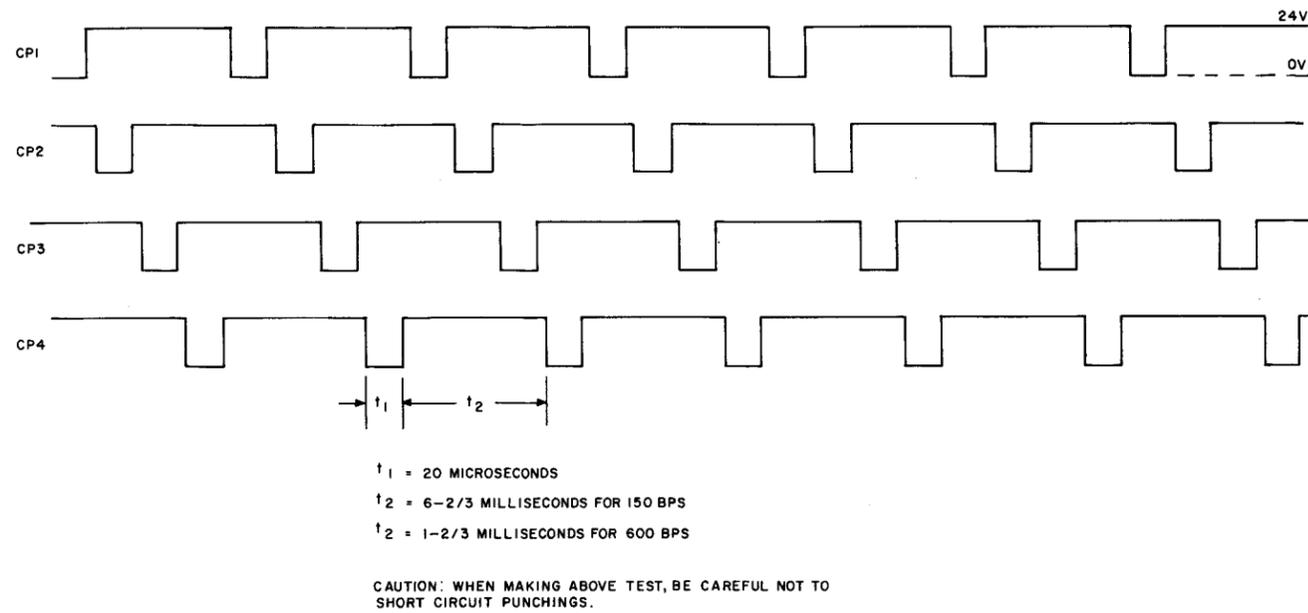
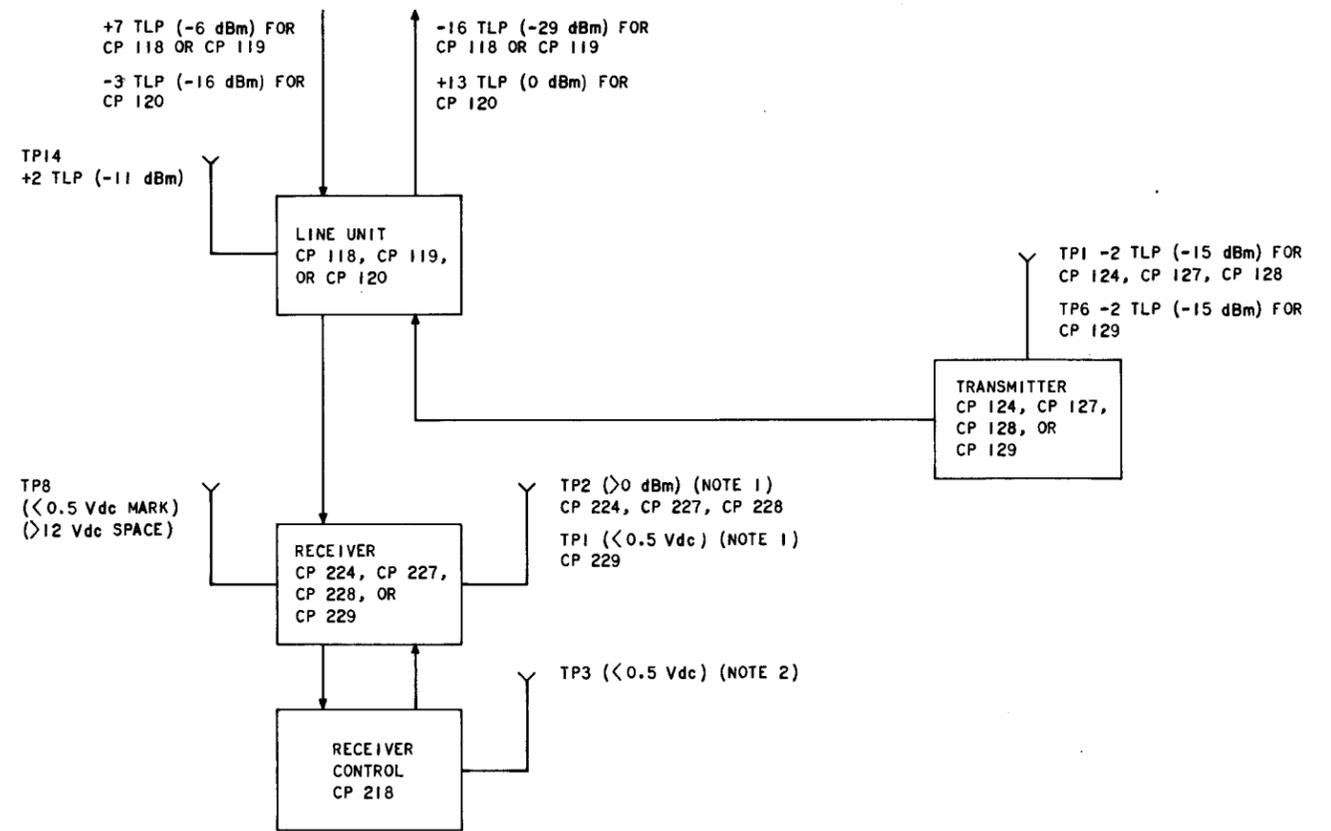


Fig. 1—Clock Waveforms

TABLE C
DATA SET FREQUENCIES

DATA SET		TRANS/RCV CP NO.	MARK FREQ	MIDBAND FREQ	SPACE FREQ
TLG 150 bps	CH 4	124/224	1770	1700	1630
	CH 7	127/227	2790	2720	2650
	CH 8	128/228	3130	3060	2990
VB 600 bps		129/229	1300	1700	2100



- NOTES:
- NUMBERS SHOWN IN BRACKETS ARE DATA LEVELS AT THE POINT INDICATED. THOSE NUMBERS NOT ASSOCIATED WITH TPs ARE SHOWN FOR REFERENCE ONLY. ACTUAL VALUES MAY BE CONSIDERABLY HIGHER THAN THE MINIMUM VALUES SHOWN. THE ACTUAL VALUE IS DEPENDENT ON THE COMBINATION OF CIRCUIT PACKS USED IN A PARTICULAR INSTALLATION.
 - TP3 ON CP 218 IS AT A VOLTAGE OF LESS THAN 0.5 Vdc WHEN THE SIGNAL LEVEL AT THE INPUT OF CP 218 IS ABOVE THE THRESHOLD LEVEL OF -29 dBm. WHEN THE SIGNAL IS BELOW THE THRESHOLD VALUE, TP3 SHALL BE GREATER THAN +12 Vdc.

Fig. 2—Data Transmission Circuit—Level Diagram

TABLE D

GROUP REPORT SWITCH SETTINGS

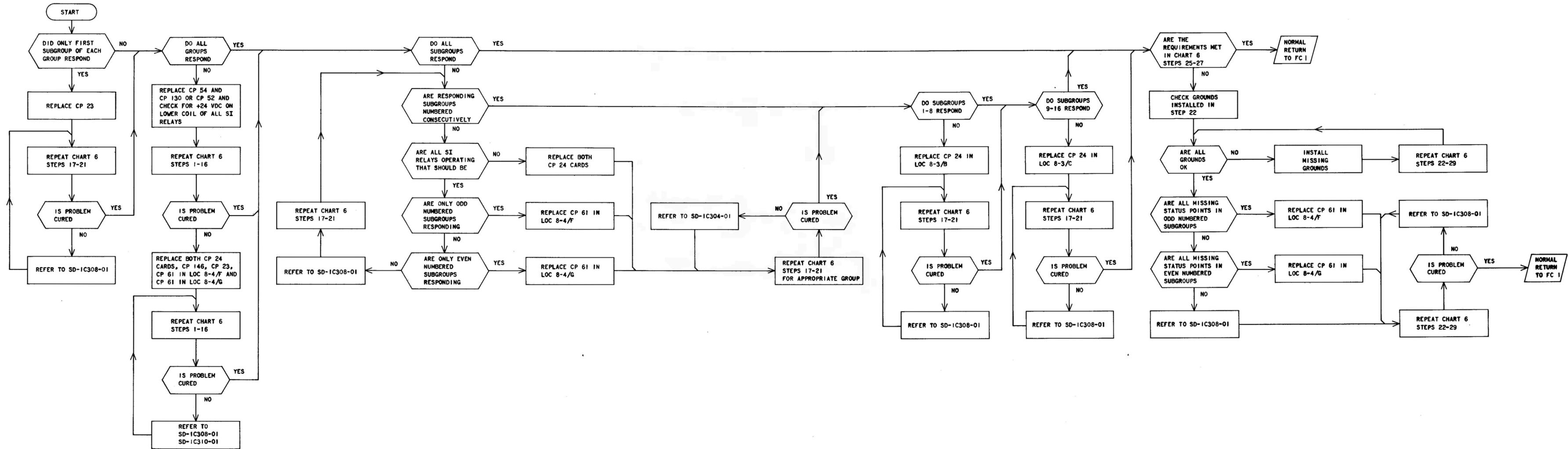
GROUP NUMBER	WORD 1 SWITCH NUMBERS				
	2	14	15	16	17
1	1	0	0	0	0
2	1	0	0	0	1
3	1	0	0	1	0
4	1	0	0	1	1
5	1	0	1	0	0
6	1	0	1	0	1
7	1	0	1	1	0
8	1	0	1	1	1
9	1	1	0	0	0
10	1	1	0	0	1
11	1	1	0	1	0
12	1	1	0	1	1
13	1	1	1	0	0
14	1	1	1	0	1
15	1	1	1	1	0
16	1	1	1	1	1

LEGEND:

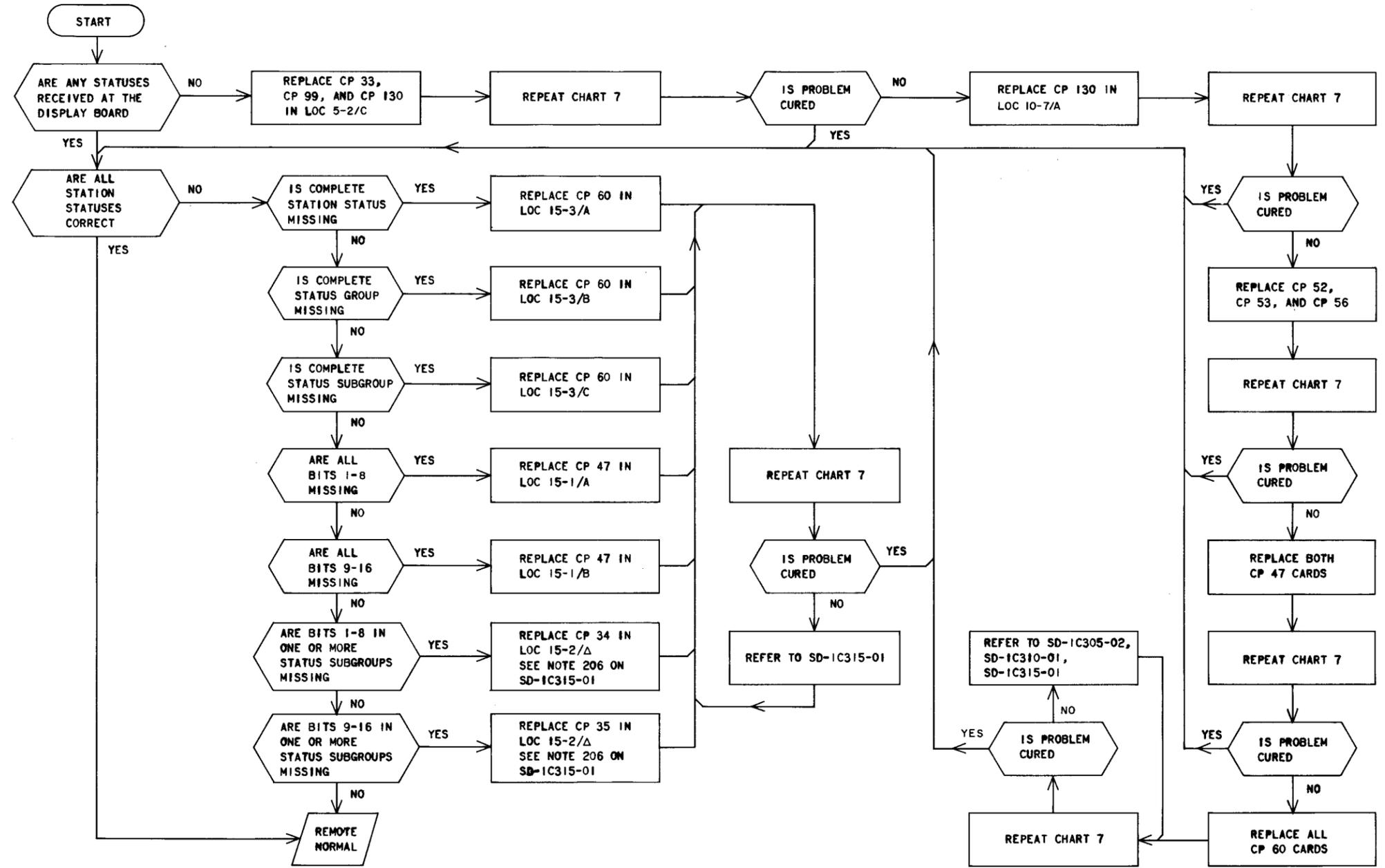
1 - LIGHTED LAMP

0 - EXTINGUISHED LAMP

Note: Information lamps not in table are all 0s.



Flowchart 2—Group Transmitting Mode



Flowchart 3—Status Receiving (Eavesdropping) Mode