E2 STATUS REPORTING AND CONTROL SYSTEM
ALARM REPORTING REMOTE
TROUBLESHOOTING PROCEDURES

This section contains step-by-step procedures to be performed on E2 alarm reporting remotes to determine the nature and location of a problem(s). This procedure should be started only after going through the E2 Initial System Diagnosis, Section 201-644-501, and determining that the E2 remote is suspected to be defective.

Start with Flowchart 1 and proceed as directed to the appropriate charts. 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). Charts 6 through 9 are used two ways: (1) to determine if the remote will alarm poll, display report, group report and switch correctly, and (2) with Flowcharts 2 through 6 to test and fix that circuitry.

If the remote is equipped for remote callup (used with L5 carrier), Chart 10 and Flowchart 7 are used to test and repair that circuitry, with Chart 10 being used both alone and together with Flowchart 7. If the remote is equipped with a turnaround panel (used for maintenance with TSS), Chart 11 and Flowchart 7 are used to test and repair the circuitry. Chart 11 may be used without Flowchart 7.

The reference to an SD on the 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.

CHART **PAGE**

CHART 1

INITIAL TEST

APPARATUS:

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

E1/E2 Manual Alarm Central Plug-In without RCU (KS-20937-L3), or

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Plug test set into a 110 Vac outlet.

2 Connect the E1/E2 test cable to the test set.

3 Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).

4 Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot. Do not seat cards.

5 Set the controls on the E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)

CHART 1 (Contd)

STEP	PROCEDURE
6	Depress the INDICATOR TEST pushbutton. ***Requirement:*** All RECEIVE indicator lamps will light.
7	Depress the MASTER CLEAR pushbutton. ***Requirement:*** All RECEIVE indicator lamps should be off.
8	Seat the test cable cards.
9	Depress the ALARM REPORT switch on the test set.
10	Depress the START pushbutton. ***Requirement:*** The RCV and VALID WORD indicators will blink and RECEIVE-INFORMATION indicator lamp number 1 will light. If this requirement is met, the bay will respond to a command.
11	Return to Flowchart 1.

CHART 2

DATA TRANSMISSION CONTROL (DTC) CIRCUIT TEST

APPARATUS:

Oscilloscope, Tektronix 453, or equivalent

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

Spare Circuit Packs

STEP	PROCEDURE
	Caution: Remove power from bay before removing or replacing any circuit pack.
1	Remove the data transmission circuit CPs located in slots 1-1/A, 1-1/B, 1-1/C, and 1-1/D.
2	Ground pin 16 (RD lead) on CP 93.
3	Remove CP 29.
	Note: 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 A with a VOM or oscilloscope, in the order shown, for the designed 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.

TABLE A

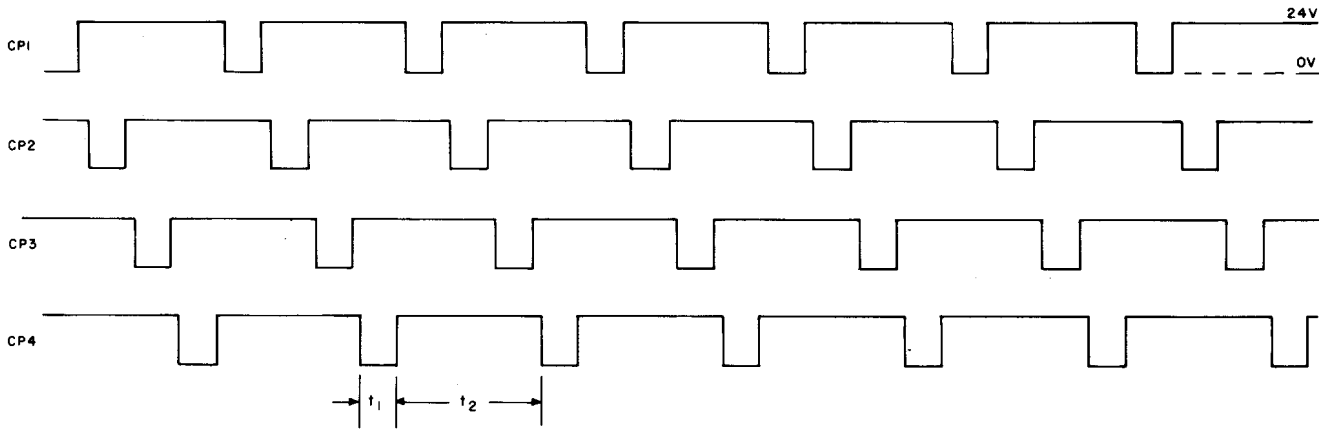
DTC LOGIC LEVELS

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

‡ *Caution: Remove power from bay before removing or replacing any circuit pack.*



t_1 = 20 MICROSECONDS

t_2 = 6-2/3 MILLISECONDS FOR 150 BPS

t_2 = 1-2/3 MILLISECONDS FOR 600 BPS

CAUTION: WHEN MAKING ABOVE TEST, BE CAREFUL NOT TO SHORT CIRCUIT PUNCHINGS.

Fig. 1—Clock Pulses

CHART 3

OPERATIONAL TEST OF THE DATA TRANSMISSION CIRCUIT

APPARATUS:

21A Transmission Measuring Set (TMS)

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

Oscilloscope, Tektronix 453, or equivalent

Vacuum Tube Voltmeter (VTVM), Hewlett Packard (HP), 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 (TP) 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 dB less than the specified TLP value. This is an important point in that all tests must be performed at data signal level and not TLP level.

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

STEP	PROCEDURE
	Caution: Remove power from bay before removing or replacing any circuit pack.
1	Apply a space frequency (See Table B), 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 will be greater than +12 Vdc.
3	Remove the space-frequency tone.

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

CHART 3 (Contd)

STEP	PROCEDURE
	Requirement: The voltage at TP 8 will be less than +0.5. Vdc.
4	Reapply the space-frequency tone.
	Requirement: The voltage at TP 8 will 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	Replace the CPs in the following order, rechecking Steps 2, 3, and 4 after each substitution, if the data set fails any of the preceding tests. • Data receiver (CP 224, 227, 228, or 229) • Receiver Control (CP 218) • Line unit (CP 118, 119, or 219, 120, or 134).
7	Connect the 21A detector input to the BR2 OUT (AMP OUT)* jack and plug a monitor receiver into the 21A monitor jack.
8	Operate the loopback key and proceed with Step 10 if equipped for loopback.
9	Disconnect the 21A oscillator from the line unit input if not equipped for loopback. Ground TP 1 on CP 93 and remove CP 94 in the DTC circuit.
10	Observe the output level on the 21A TMS. ***Requirement:*** If CP 118, 119, or 219 is present, the level will be approximately -29 dBm; if CP 120 or 134 is present, the level will be approximately 0 dBm.
11	Replace the CP in the following order, rechecking Step 10 after each substitution, if the data set fails Step 10. • Data transmitter (CP 124, 127, 128, 129, or 220) • Line unit (CP 118, 119, or 219, 120, or 134).
12	Change the 21A oscillator to the space frequency if equipped for loopback. ***Requirement:*** The tone heard on the monitor receiver will be the space frequency.
13	Reinsert CP 94 if not equipped for loopback.

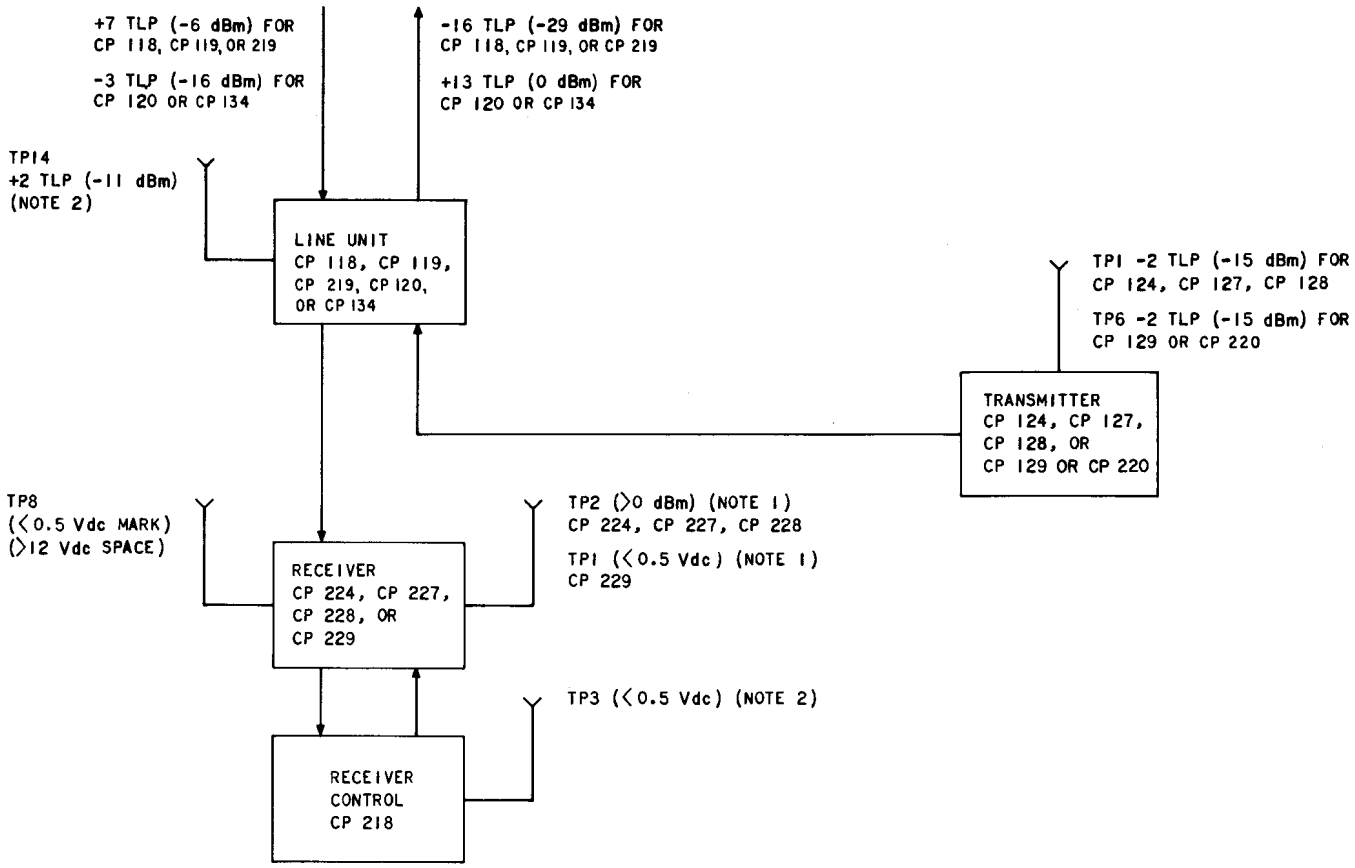
*Bracketed designations refer to jacks associated with CP 118 or CP 120.

CHART 3 (Contd)

STEP	PROCEDURE

Requirement: The tone heard on the monitor receiver will periodically shift between mark and space, resulting in a chirping sound.

Note: 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.



NOTES:
1. 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.
2. 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 B

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		220 or 129/229	1300	1700	2100

CHART 4

ALIGNMENT TEST OF THE DATA TRANSMISSION CIRCUIT

APPARATUS:

21A Transmission Measuring Set

Volt-Ohm-Milliammeter, KS-14510-L1, or equivalent

Oscilloscope, Tektronix 453, or equivalent

STEP **PROCEDURE**

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Apply a -23 dBm0 tone to the BR2 IN (AMP IN)* jack using a 21A TMS, or equivalent.

Note: If the voiceband data set is being tested, the frequency will be 1300 Hz; if a telegraph channel data set is being tested, the frequency will be the space frequency (see Table B).

2 Observe the signal TP 14 on CP 118, 119, or 219, 120, or 134.

Requirement: The signal level will 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 TP 3 will 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 as follows:

Requirement:

LINE UNIT	THRESHOLD CP 224, CP 229	THRESHOLD CP 227, CP 228
CP 118, CP 119	−19 ±0.5 dBm	−23 ±0.5 dBm
CP 212, CP 120 CP 134	−29 ±0.5 dBm	−33 ±0.5 dBm

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

CHART 4 (Contd)

STEP	PROCEDURE
5	Connect the 21A detector input to the BR2 OUT (AMP OUT)* jack.
6	Operate the loopback key if equipped for loopback.
7	Ground TP 1 on CP 93 located in the DTC circuit if not equipped for loopback. Remove CP 94.
8	Observe the signal level at TP 1 or CP 124, 127, or 128, or TP 6 on CP 129, or 220 on the data transmitter. ***Requirement:*** The signal level will be -15 ±0.5 dBm.
9	Observe the signal level at the BR2 OUT (AMP OUT)* jack. ***Requirement:*** The level will be -29 ±0.5 dBm for CP 118, 119, or 219, or 0 ±0.5 dBm for CP 120, or 134. ***Note:*** If the voltage and signal levels are within the limits outlined previously, the data set is in proper alignment. If any of the preceding 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).

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

CHART 5

ALIGNMENT PROCEDURE FOR THE DATA TRANSMISSION CIRCUIT

APPARATUS:

21A Transmission Measuring Set

Frequency Counter, Hewlett Packard 5233L, or equivalent

Vacuum Tube Voltmeter, Hewlett Packard 400D, or equivalent

Volt-Ohm-Milliammeter, KS-14510-L1, or equivalent

Oscilloscope, Tektronix 453, or equivalent

STEP	PROCEDURE
	Caution: Remove power from bay before removing or replacing any circuit pack.
1	Remove the DTC circuit fuses (F2, F7, and F18), then remove CP 93 and reinsert the fuses.
2	Apply a -13 dBm0 tone to the BR2 IN (AMP IN)* jack using a 21A TMS, or equivalent. ***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 B).
3	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 a telegraph channel is being tested. Read the frequency directly from the oscillator dial if the voiceband data set is being tested.
4	Connect an HP 400D VTVM, or equivalent, to TP 14 on CP 118, 119, 219, 120, or 134, and observe the signal level. ***Requirement:*** The signal level will be -11 ±0.5 dBm.
5	Adjust R3 on CP 119 or 219, or R2 on CP 118, 120, or 134 for the required level if the preceding requirement is not met.
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.

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

CHART 5 (Contd)

STEP	PROCEDURE

Requirement: The signal level at the mark and space frequencies will 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 follows:

RECEIVER	FREQUENCY*	SIGNAL LEVEL	
		CP 188 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 B

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

Requirement: The voltage will be less than +0.5 Vdc. If the voltage is +12 Vdc or more, ***omit*** 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 will shift to greater than +12 Vdc.

10 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 if either of the two preceding requirements are not met. Repeat Steps 7 through 9 to verify the adjustments.

11 Replace CP 218 and repeat Steps 7 through 10 if the requirements in Steps 7 through 10 cannot be met following the adjustment.

12 Increase the output level of the 21A oscillator to -16 dBm, and adjust the frequency to the space frequency (see Table B).

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 will 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.

CHART 5 (Contd)

STEP	PROCEDURE
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 will occur at 1750 ±20 Hz. For narrowband data sets, see Table B.
16	Adjust potentiometer R23 on CP 224, 227, or 228, or potentiometer R21 on CP 229 until the voltage shift occurs at the correct frequency if the voltage shift in Step 5 does not occur 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 220, 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 jacks.
18	Perform Steps 20 through 26 if the data set is equipped for loopback.
19	Omit Steps 20 through 25 and perform Steps 26 through 31 if the data set ***is not*** equipped for loopback.
20	Operate the loopback key, and adjust the 21A TMS to the space frequency (see Table B).
21	Observe the signal level indicated on the VTVM, and note that the tone heard on the monitor is the space frequency. ***Requirement:*** The signal level reading on the VTVM will be -15 ±1 dBm.
22	Adjust potentiometer R25 on CP 129 or 220, or potentiometer R14 on CP 124, 127, or 128 so that the level is -15 ±1 dBm if the requirement is not met.
23	Change the 21A TMS oscillator to the mark frequency (see Table B). ***Requirement:*** The signal level indicated on the VTVM will be -15 ±1.5 dBm. The tone heard on the monitor will 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 will be -29, ±0.5 dBm for CP 118, 119, or 219, and 0 ±0.5 dBm for CP 120 or 134. If necessary, adjust potentiometer R6 on CP 118 or CP 120, or potentiometer R5 on CP 119 or CP 219 to meet this requirement.

CHART 5 (Contd)

STEP	PROCEDURE
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 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 will be -15 ±1 dBm. If necessary, adjust potentiometer R25 on CP 129 or 220, 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 will be -29 ±0.5 dBm for CP 118, 119, or 219, or 0 ±0.5 dBm for CP 120 or 134. If necessary, adjust potentiometer R6 (CP 118, 120, or 134) or R5 (CP 119 or 219) for the required output level.
30	Reinsert CP 94 and note that the output level oscillates near -29 dBm. The extremes will not exceed -29 ±1 dBm. If this requirement is not met, the data transmitter card (CP) must be replaced.
31	Remove the ground from TP 1 on CP 93 and all test connections and terminations.

CHART 6

ALARM POLL MODE TEST

APPARATUS:

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

E1/E2 Manual Alarm Central Plug-In without RCU (KS-20937-L3), or

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Plug the test set into a 110 Vac outlet.

2 Connect the E1/E2 test cable to the test set.

3 Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).

4 Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot. ***Do not seat cards.***

5 Set the controls on E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)

CHART 6 (Contd)

STEP	PROCEDURE
6	Depress the INDICATOR TEST pushbutton. ***Requirement:*** All RECEIVE indicator lamps will light.
7	Depress the MASTER CLEAR pushbutton. ***Requirement:*** All RECEIVE indicator lamps will go off.
8	Seat the test cable cards.
9	Depress the ALARM REPORT switch on the test set.
10	Depress the START pushbutton. ***Requirement:*** The VALID WORD indicator lamp will blink. If the requirement is met, the remote answered the alarm poll command. If the requirement is not met, replace CP 8, 15, or 131 in location 7-1/A; and repeat the step. If the requirement is still not met, refer to SD-1C307-01 for CP 8 or CP 15, or SD-1C307-02 for CP 131.
11	Determine how many alarms are reported by the bay. Determine one status input point assigned to each alarm, and ground those points. ***Note:*** The total number of alarms contained in an alarm poll reply depends on the type of central bay to which it reports. The possible poll reply words are shown as follows: A. E2 remote to an E2 central: Alarms / Parity 1 2 7 8 17 18 24 1 X X X X X X 0 0 0 0 0 0 0 0 0 0 X X X X X X X B. E2 remote (J92617AJ, -AK, or -AL bay) to an E1 central: Alarms / Parity 1 2 14 15 16 17 18 24 1 X X X X X X X X X X X X X X 0 0 0 X X X X X X X C. E2 remote (J92617J, -K, or -L bay with J92618C panel) to an E1 Central. 1 2 17 18 24 1 0 X X X X X X X X X X X X X X X X X X X X X X X

CHART 6 (Contd)

STEP	PROCEDURE
12	Depress the START pushbutton. ***Requirement:*** The RECEIVE-INFORMATION indicator lamps corresponding to the alarms will light. Record any indicator lamps that should light but do not.
13	Remove the grounds installed in Step 11.
14	Unseat all CP 136 and 137, or CP 36 and 37, cards and all CP 26 cards, and then reinsert them.
15	Depress the START pushbutton. ***Requirement:*** RECEIVE indicator lamp number 1 will light. All other RECEIVE information indicators will remain off.
16	Return to Flowchart 1 if all requirements in the test are met and the remote processes alarm information correctly. Proceed to Flowchart 2 if all requirements are not met and the remote uses CP 131 and CP 136, or CP 137; proceed to Flowchart 3 if other CPs are used.

CHART 7

GROUP REPORT MODE TEST

APPARATUS:

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

E1/E2 Manual Alarm Central Plug-In without RCU (KS-20937-L3), or

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Plug the test set into an 110 Vac outlet.

2 Connect the E1/E2 test cable to the test set.

3 Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).

4 Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot.

5 Set the controls on the E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)
GROUP REPORT	Depress (lighted indicator lamp)
GRP/I/0	First group

CHART 7 (Contd)

STEP	PROCEDURE
6	Determine the number of groups and subgroups the bay reports.
7	Depress the START pushbutton. ***Requirement:*** The RCV and VALID WORD indicators will blink. The ERROR WORD indicator lamp will not light. ***Note:*** If the remote passes this step, it responds to GROUP REPORT commands.
8	Advance the GRP/I/O switch to the next group and repeat Step 7. Continue this procedure for all remaining groups. ***Note:*** If the remote meets the requirements in Step 7 for each group, all groups respond to the GROUP REPORT command.
9	Set the GRP/I/O switch to the first group.
10	Set the DISPLAY WORD SELECT switch to 16.
11	Depress the START pushbutton. ***Requirement:*** The RCV and VALID WORD indicator lamps will blink. If the ERROR indicator lamp lights, repeat Step 11. If the indicator lights again, then all the even-numbered subgroups are not reporting. Determine which one(s) are not reporting by setting the DISPLAY WORD SELECT switch to each even-numbered subgroup and repeat Step 11. Record the numbers of the subgroups for which the ERROR WORD indicator lights.
12	Set the DISPLAY WORD SELECT switch to 15, and repeat Step 11 for the odd-numbered subgroups.
13	Repeat Steps 9 through 11 for each group.
14	Choose one even and one odd subgroup within any group, and ground all the status input points corresponding to those subgroups.
15	Set the GRP/I/O switch to the group chosen in Step 14.
16	Set the DISPLAY WORD SELECT switch to the number correspoinding to the even subgroup chosen in Step 14.
17	Depress the START pushbutton. ***Requirement:*** All the station test set indicators corresponding to the grounded status input points will light.

CHART 7 (Contd)

STEP	PROCEDURE
18	Repeat Steps 16 and 17 for the odd subgroup.
19	Remove all grounds placed on status input points in Step 14.
20	Repeat Steps 16 through 17. ***Requirement:*** No RECEIVE-INFORMATION lamps will light. The START pushbutton may have to be depressed a second time to clear any status input points with memory.
21	Return to Flowchart 1 if the remote met all requirements of the test. Go to Flowchart 4 and perform the indicated maintenance if the requirements are not met.

CHART 8

DISPLAY REPORT MODE TEST

APPARATUS:

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

E1/E2 Manual Alarm Central Plug-In without RCU (KS20937-L3), or

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE
	Caution: Remove power from bay before removing or replacing any circuit pack.
1	Plug test set into 110 Vac outlet.
2	Connect the E1/E2 test cable to the test set.
3	Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).
4	Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot.
5	Determine which displays are reported from the remote (see Table C).

CHART 8 (Contd)

STEP	PROCEDURE

6 Set controls on the E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)
GRP/I/0	1
DISPLAY	A
DISPLAY REPORT	Depress (lighted indicator lamp)

7 Depress the START pushbutton.

Requirement: The RCV and VALID WORD indicator lamps will blink, and the ERROR WORD indicator lamp will remain off. If the requirement is met, the remote responds to display report commands. If the requirement is not met, proceed to Flowchart 5 and perform the indicated maintenance and then repeat Chart 8.

8 Set the GRP/I/O and DISPLAY switches to the proper positions for the next display (see Table C) and repeat Step 7.

9 Repeat the procedure used in Step 8 for all remaining displays.

Note: Record the display which does not respond to the display report command.

10 Set the DISPLAY WORD SELECT switch to position 4, and repeat Steps 7 through 9.

Note: If the ERROR WORD indicator lights, one or more of the four words are not being reported to the test set. To determine which ones are not reporting, set the DISPLAY WORD SELECT switch to each word in the display and repeat Step 7. Record each word, display, and group for which the ERROR WORD indicator lights.

CHART 8 (Contd)

STEP	PROCEDURE
11	Ground one status input point for each display. Where possible, choose a point that connects to CP 26 (alarm net with memory).
12	Set the controls on the station test set as follows:

SWITCH	POSITION
DISPLAY ERROR WORD	OFF
DISPLAY WORD SELECT	1
DISPLAY	A
GROUP	1

13 Depress the START pushbutton.

Requirement: All RECEIVE-INFORMATION indicator lamps will light. Record any lamps which do not light and continue the test.

14 Set the DISPLAY WORD SELECT switch to position 2, and repeat Step 13.

15 Repeat Step 14 for words 3 and 4.

16 Set the DISPLAY switch to B, and repeat Steps 13 through 15.

Note: Steps 12 and 13 are tests of the index display, and an indicator for each display in the remote should light for displays A and B. If the appropriate indicator(s) do not light, keep a record of it and finish this test before proceeding to the flowcharts.

17 Scan each display (see Table C for switch settings).

Requirement: The status input point that was grounded in Step 11 will be the only status reporting to the test set. Record any status input points reporting to the test set for which you did not provide the ground. Check those points to ensure that a monitored bay is supplying the ground and that nothing is wrong with the E2 equipment.

Note: You have to scan each display four times. Advance the DISPLAY WORD SELECT switch so that the proper word in the display is recorded by the station test set indicator lamps.

18 Remove the ground installed in Step 11.

19 Scan each display once to clear the alarm.

20 Depress the ALARM REPORT switch.

CHART 8 (Contd)

STEP	PROCEDURE
21	Depress the START pushbutton. ***Requirement:*** RECEIVE-INFORMATION indicator lamp number 1 will light. If the bay contains the RCU panel (J92618AF), indicator lamp number 17 may light; if it does, ignore it.
22	Return to Flowchart 1 if the remote meets all the requirements of the test. Proceed to Flowchart 5 and perform the indicated maintenance if the remote failed one or more of the requirements.

TABLE C

SWITCH SETTING FOR DISPLAY COMMANDS

DISPLAY	DISPLAY SWITCH	GRP/I/O SWITCH	DISPLAY	DISPLAY SWITCH	GRP/I/O SWITCH	DISPLAY	DISPLAY SWITCH	GRP/I/O SWITCH
1	A	1	29	A	8	57	A	15
2	B	1	30	B	8	58	B	15
3	C	1	31	C	8	59	C	15
4	D	1	32	D	8	60	D	15
5	A	2	33	A	9	61	RESERVED	
6	B	2	34	B	9	62	RESERVED	
7	C	2	35	C	9	63	RESERVED	
8	D	2	36	D	9	64	RESERVED	
9	A	3	37	A	10			
10	B	3	38	B	10			
11	C	3	39	C	10			
12	D	3	40	D	10			
13	A	4	41	A	11			
14	B	4	42	B	11			
15	C	4	43	C	11			
16	D	4	44	D	11			
17	A	5	45	A	12			
18	B	5	46	B	12			
19	C	5	47	C	12			
20	D	5	48	D	12			
21	A	6	49	A	13			
22	B	6	50	B	13			
23	C	6	51	C	13			
24	D	6	52	D	13			
25	A	7	53	A	14			
26	B	7	54	B	14			
27	C	7	55	C	14			
28	D	7	56	D	14			

CHART 9

REMOTE SWITCH MODE TEST

APPARATUS:

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

E1/E2 Manual Alarm Central Plug-In without RCU (KS-20937-L3), or

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE
	Caution: Remove power from bay before removing or replacing any circuit pack.
1	Plug test set into 110 Vac outlet.
2	Connect the E1/E2 test cable to the test set.
3	Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).
4	Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot.
5	Determine the number of remote switches in the remote bay, and record the remote switch settings for each.
6	Determine the remote switch to be operated.

CHART 9 (Contd)

STEP	PROCEDURE

7 Set the controls on the E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)
REMOTE SWITCH	Switch address
REMOTE SWITCH (button)	Depress (lighted indicator lamp)

8 Depress the START pushbutton.

Requirement: The selected remote switch will operate and test set RECEIVE-INFORMATION indicator lamp number 1 will light.

9 Repeat Steps 6 through 8 for each remote switch to be tested and record any improper operation.

10 Return to Flowchart 1 if the remote bay meets the requirements of this test. Proceed to Flowchart 6 and perform the indicated maintenance if the requirements are not met.

CHART 10

REMOTE CALLUP MODE TEST

APPARATUS:

Remote Callup Test Set, Model RCU-100

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

E1/E2 Manual Alarm Central Plug-In with RCU (KS-20937-L2)

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

STEP	PROCEDURE

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Set the controls on the RCU test set as follows:

SWITCH	POSITION
MANUAL CENTRAL/AUTOMATED CENTRAL	MANUAL CENTRAL
STATION ADDRESS	20 000
CONTINUE	DOWN
IMMEDIATE REPLY	DOWN
I/O ADDRESS	8
DATA PATTERN	B
DATA WORDS SENT	15
BR DELAY	DOWN
INSANE	DOWN
TEST	DOWN
DISPLAY	B
POWER	OFF
BUSY	DOWN
RESPONSE REPLY	DOWN

CHART 10 (Contd)

STEP	PROCEDURE
2	Plug the RCU test set into a 110 Vac outlet.
3	Set the POWER switch to the ON position. ***Requirement:*** All RECEIVED WORD indicators (1-16) will light. If this requirement is not met, perform the tests for the RCU test set per Section 201-644-142.
4	Set the TEST switch in the ON position.
5	Depress the LB pushbutton. ***Requirement:*** The UBR and ULB indicator lamps will blink.
6	Depress the READ pushbutton. ***Requirement:*** The READ indicator lamp will blink. If the requirements in Steps 6 and 7 are not met, perform the tests for the RCU test set per Section 201-644-142.
7	Set the TEST switch in the down position. ***Requirement:*** The following indicator lamps will be off: UBR ULB UGE UNE UTE UDI UNL READ RECEIVED ERROR
8	***With the cables provided,*** connect one from the CONNECT TO J1 jack on the test set to the J1 jack on J92618AF panel. Connect the other from the CONNECT TO J2 jack on the test set to the J2 jack on the J9261AF panel.

CHART 10 (Contd)

STEP	PROCEDURE

Note: If the AF panel contains a J92618AT(L2) or a J92618AG buffer unit, connect the cables to the J1 and J2 jacks on the buffer unit in the TSC console. If the panel contains a J92618AT(L1) unit, connect the cables to J1 and J2 of the J92618AT(L1) unit.

9 Plug the E-telemetry station test set into a 110 Vac outlet.

10 Connect the E1/E2 test cable to the test set.

11 Remove the data transmitter CP (124, 127, 128, 129, or 220) and the data receiver CP (224, 227, 228, or 229).

12 Insert test connection card CP (b) in the data transmitter slot and test connection card CP (c) in the data receiver slot.

13 Set the controls on the E-telemetry station test set as follows:

SWITCH	POSITION
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	ON
STATION	Remote station address (last two digits)
DI	OFF

14 Depress the MASTER CLEAR pushbutton on the station test set.

15 Depress, in order, the ALARM REPORT switch and the START pushbutton.

Requirement: RECEIVE-INFORMATION indicator lamp number 17 will be off. If this requirement is met, go to Step 19. If it is not met, go to Step 16 (this procedure may need to be repeated).

16 Depress the GROUP REPORT switch and set the GRP/I/O switch to 16.

17 Depress, in order, the START pushbutton, the QUICK REPLY pushbutton, and the START pushbutton.

CHART 10 (Contd)

STEP	PROCEDURE
18	Repeat Step 15.
19	Depress the SEND pushbutton on the RCU test set.
20	Depress the START pushbutton on the station test set.
	Requirement: RECEIVE-INFORMATION indicator lamp number 17 will be lighted.
21	Depress the GROUP REPORT switch and set the GRP/I/O switch to 16.
22	Depress the START pushbutton on the station test set (watch for requirements).
	Requirement 1: On the RCU test set, the UBR, ULB, and UGE indicator lamps will blink.
	Requirement 2: On the station test set, the RECEIVE-INFORMATION indicator lamp numbers 1, 8, and 14 will light.
	Note: If the requirement in Step 22 is met, the RCU test set has transmitted a block of data.
	Quick Reply Reception Test
23	Depress the QUICK REPLY pushbutton switch on the station test set.
24	Depress the START pushbutton on the station test set (watch for requirement).
	Requirement: On the RCU test set, the UNE indicator lamp will blink.
25	Depress the SEND pushbutton on the RCU set.
26	Depress the GROUP REPORT button on the station test set.
27	Depress the START pushbutton on the station test set.
28	Set the NE-TE switch to TE and depress the QUICK REPLY pushbutton on the station test set.
29	Depress the START pushbutton on the station test set (watch for requirement).
	Requirement: On the RCU test set, the UTE indicator lamp will flash.
30	Set the DI switch to the ON position.
31	Depress the SEND pushbutton on the RCU test set.
32	Depress the GROUP REPORT pushbutton switch on the station test set.

CHART 10 (Contd)

STEP	PROCEDURE
33	Depress the START pushbutton on the station test set.
34	Set the NE-TE switch to NE, and depress the QUICK REPLY pushbutton switch.
35	Depress the START pushbutton (watch for requirement). ***Requirement:*** On the RCU test set, the UDI indicator lamp will blink.
	Continue Test
36	Set the CONTINUE switch to the up position on the RCU test set.
37	Depress the GROUP REPORT pushbutton switch on the station test set.
38	Depress the SEND pushbutton on the RCU test set.
39	Depress the START pushubutton on the station test set (watch for requirement). ***Requirement 1:*** On the RCU test set, the UBR, ULB, and UGE indicator lamps will blink. ***Requirement 2:*** On the station test set, RECEIVE-INFORMATION indicator lamp numbers 1, 8, 12, and 14 will light.
40	Repeat Step 39 several times to verify that RCU continues operation, and the TMT, RCV, and VALID WORD indicators light on the station test set.
	Response Reply Reception Test
41	Set the controls on the RCU test set to the following positions:

SWITCH	POSITION
CONTINUE	DOWN
IMMEDIATE REPLY	UP
SEND	DEPRESS

42	Depress the START pushbutton on the station test set (watch for requirement). ***Requirement 1:*** On the RCU test set, the UBR, ULB, and UGE indicator lamps will blink. ***Requirement 2:*** On the station test set, RECEIVE-INFORMATION indicator lamp numbers 1, 8, 13, and 14 will light.

CHART 10 (Contd)

STEP	PROCEDURE

43 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One number higher than the remote bay address.
GROUP REPORT	Depress
RECEIVER CLEAR	Depress

44 Depress the START pushbutton (watch for requirement).

Requirement: No RECEIVE-INFORMATION indicator lamps will light.

45 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address
REMOTE ROLL-UP	Depress
DATA PATTERN	B
GRP/I/O	9

46 Depress the START pushbutton (watch for requirement).

On the RCU test set—

Requirement 1: The READ indicator lamp will blink.

Requirement 2: The odd indicator lamps in the RECEIVE WORD will light.

Requirement 3: The DATA WORDS RECEIVED will indicate 15.

On the station test set—

Requirement 4: RECEIVE-INFORMATION indicator lamp number 1 will light.

47 Depress the ALARM REPORT pushbutton.

48 Depress the START pushbutton.

Requirement: RECEIVE-INFORMATION indicator lamp number 17 will not light.

49 Set the IMMEDIATE REPLY switch to the down position on the RCU test set.

CHART 10 (Contd)

STEP	PROCEDURE
	Data Test
50	Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One higher than remote bay address
GROUP REPORT	Depress
GRP/I/O	16
RECEIVE CLEAR	Depress

Note: Record the station address used.

51 Depress the START button (watch for requirement).

Requirement: RECEIVE-INFORMATION indicator lamp numbers 1 through 17 will remain OFF.

52 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address
REMOTE CALL UP	Depress
GRP/I/O	9

53 Depress the START pushbutton (watch for requirement).

On the RCU test set—

Requirement 1: The READ indicator lamp will blink.

Requirement 2: The odd indicator lamps in the RECEIVED WORD will light.

Requirement 3: The DATA WORDS RECEIVE will indicate 15.

On the station test set—

Requirement 4: RECEIVE-INFORMATION indicator lamp number 1 will light.

54 Set the station test set DATA PATTERN switch to A.

55 Set the RCU test set DISPLAY switch to A.

CHART 10 (Contd)

STEP	PROCEDURE
56	Depress the START pushbutton on the station test set. ***Requirement:*** On the RCU test set, all even-numbered RECEIVED WORD indicator lamps will light.
	Quick Reply Busy Test
57	Set the BUSY switch to the up position on the RCU test set.
58	Repeat Steps 50 through 52.
59	Depress the START pushbutton (watch for requirement). ***Requirement 1:*** On the RCU test set, the read indicator will not blink. ***Requirement 2:*** On the station test set, RECEIVE-INFORMATION indicator lamp numbers 1 and 12 will light.
60	Set the BUSY switch to the down position on the RCU test set.
	Quick Reply Insane Test
61	Set the INSANE switch to the up position on the RCU test set.
62	Repeat Steps 50 through 52. ***Requirement:*** On the RCU test set the RECEIVED ERROR indicator lamp will light.
63	Depress the START pushbutton on the station test set. ***Requirement:*** RECEIVE-INFORMATION indicator lamp numbers 1, 12, and 13 will light.
64	Set the INSANE switch to the down position on the RCU test set.
	Immediate Reply Transmission Test
65	Depress the ALARM REPORT pushbutton on the station test set.
66	Depress the START pushbutton.
67	Repeat Steps 50 through 52.
68	Set the IMED REPLY switch to the ON position.
69	Depress the START pushbutton.

CHART 10 (Contd)

STEP	PROCEDURE
	Requirement: On the RCU test set, the DATA WORDS RECEIVED display will indicate 15.
70	Depress the GROUP REPORT switch on the station test set.
71	Set the GRP/I/O switch to 16.
72	Depress the START pushbutton.
	Requirement: RECEIVE-INFORMATION indicator lamp numbers 1, 3, 14, 15, 16, and 17, and the station address lamps (indicator lamps 4 through 7) corresponding to the remote address (see Table D) in Step 50 will light.
73	Set the DISPLAY WORD SELECT switch to position 2.
74	Repeat Steps 50 through 52.
75	Depress the START pushbutton.
	Requirement: On the RCU test set, the DATA WORDS RECEIVED display will indicate 15.
76	On the station test set, depress the GROUP REPORT switch.
77	Set the GRP/I/O switch to 16.
78	Depress the START pushbutton.
	Requirement: RECEIVE-INFORMATION indicator lamp number 1 and the station address lamps (indicator lamps 4 through 7) corresponding to the remote address (see Table D) in Step 50 will light. Disregard the state of indicator lamp numbers 14 through 17.
79	Set the DISPLAY WORD SELECT switch to position 3.
80	Repeat Steps 50 through 52.
81	Depress the START pushbutton.
	Requirement: On the RCU test set, the DATA WORDS RECEIVED display will indicate 15.
82	Depress the GROUP REPORT switch on the station test set.
83	Set the GRP/I/O switch to 16.
84	Depress the START pushbutton.

CHART 10 (Contd)

STEP	PROCEDURE

Requirement: No RECEIVE-INFORMATION indicator lamp will light, and the ERROR WORD indicator lamp will light on the station test set.

Response Reply Transmission Test

85 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One higher than remote bay address.
GROUP REPORT	Depress
GRP/I/O	16
DISPLAY WORD SELECT	1
IMED REPLY	UP

86 Set the RESPONSE REPLY switch to the up position on the RCU test set.

87 Depress the START pushbutton on the station test set.

88 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address.
GRP/I/O	9
REMOTE CALL UP	Depress

89 Depress the START pushbutton (watch for requirement).

Requirement: On the RCU test set, the READ and UBR indicator lamps will blink.

90 Set the controls on the station test set to the following positions:

SWITCH	POSITION
GRP/I/O	16
GROUP REPORT	Depress

CHART 10 (Contd)

STEP	PROCEDURE
91	Depress the START pushbutton (watch for requirement). ***Requirement 1:*** The VALID WORD indicator lamp will blink at least ***twice.*** This indicates that two or more words were received by the station test set. ***Rquirement 2:*** RECEIVE-INFORMATION indicator lamp numbers 1 and 4 through 7, corresponding to the address in Step 85, and 14 will light.
92	Depress the QUICK REPLY pushbutton.
93	Set the DI switch to the OFF position.
94	Depress the START pushbutton (watch for requirement). ***Requirement:*** On the RCU test set, the UNE indicator lamp will blink.
	Immediate Reply Busy Test
95	Set the BUSY switch to the up position on the RCU test set.
96	Repeat Steps 85 through 88.
97	Depress the START pushbutton on the station test set. ***Requirement:*** On the RCU test set, the UNL indicator will blink.
98	Set the controls on the station test set to the following positions: SWITCH — POSITION GRP/I/O — 16 GROUP REPORT — Depress
99	Depress the START pushbutton. ***Requirement:*** RECEIVE-INFORMATION indicator lamp numbers 1, 3, through 7 corresponding to the address in Step 85, and 14 through 17 will light.

CHART 10 (Contd)

STEP	PROCEDURE

100 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One higher than remote bay address.
GROUP REPORT	Depress
GRP/I/O	16
DISPLAY WORD SELECT	2
IMED REPLY	ON

101 Set the RESPONSE REPLY switch to the up position on the RCU test set.

102 Depress the START pushbutton on the station test set.

103 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address.
GRP/I/O	16
REMOTE CALL UP	Depress

104 Depress the START pushbutton (watch for requirement).

Rquirement: On the RCU test set, the UNL indicator will blink.

105 Set the controls on the station test set to the following positions:

SWITCH	POSITION
GRP/I/O	16
GROUP REPORT	Depress

106 Depress the START pushbutton.

Requirement: RECEIVE-INFORMATION indicator lamp numbers 1, 4 through 7 corresponding to the bay address, and 12 will light. Disregard indicator lamp numbers 14 through 17.

Immediate Reply Insane Test

107 Set the BUSY switch to the down position and the INSANE switch to the up position on the RCU test set.

Requirement: The RECEIVED ERROR indicator lamp on the RCU test set will light.

CHART 10 (Contd)

STEP	PROCEDURE

108 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One higher than remote bay address.
GROUP REPORT	Depress
GRP/I/O	16
DISPLAY WORD SELECT	1
IMED REPLY	ON

109 Set the RESPONSE REPLY switch to the up position on the RCU test set.

110 Depress the START pushbutton on the station test set.

111 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address.
GRP/I/O	9
REMOTE CALL UP	Depress

112 Depress the START pushbutton (watch for requirement).

Requirement: On the RCU test set, the UNL indicator lamp will blink.

113 Set the controls on the station test to the following posistions:

SWITCH	POSITION
GRP/I/O	16
GROUP REPORT	Depress

114 Depress the START pushbutton.

Requirement: RECEIVE-INFORMATION indicator lamp numbers 1, 3, 4 through 7 corresponding to the address in Step 85, and 14 through 17 will light.

CHART 10 (Contd)

STEP	PROCEDURE

115 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	One higher than remote bay address.
GROUP REPORT	Depress
GRP/I/O	16
DISPLAY WORD SELECT	2
IMED REPLY	ON

116 Set the RESPONSE REPLY switch to the up position on the RCU test set.

117 Depess the START pushbutton on the station test set.

118 Set the controls on the station test set to the following positions:

SWITCH	POSITION
STATION	Remote bay address.
GRP/I/O	9
REMOTE CALL UP	Depress

119 Depress the START pushbutton (watch for requirement).

Requirement: On the RCU test set, the UNL indicator lamp will flash.

120 Set the controls on the station test set to the following positions:

SWITCH	POSITION
GRP/I/O	16
GROUP REPORT	Depress

121 Depress the START pushbutton.

Requirement: RECEIVE-INFORMATION indicator lamp numbers 1, 4 through 7 corresponding to the remote bay address, and 13 and 14 will light.

122 Return to Flowchart 1 if the remote bay passes all requirements in the preceding test. Go to Flowchart 7 and perform the indicated maintenance if it failed any requirements.

TABLE D

STATION ADDRESS INDICATORS

STATION ADDRESS	WORD 1 SWITCH NUMBER			
	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

CHART 11

TURNAROUND 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**

Caution: Remove power from bay before removing or replacing any circuit pack.

1 Plug the test set into a 110 Vac outlet.

2 Connect E1/E2 test cable to the test set.

3 Remove the data receiver circuit pack (CP 224, 227, 228, or 229) and the transmitter circuit pack (CP 124, 127, 128, 129, or 229).

4 Insert the test connection card CP (b) in the data transmit slot and test connection card CP (c) in the data receiver slot. **Do not seat the cards.**

5 Set the controls on the E-telemetry station test set as follows:

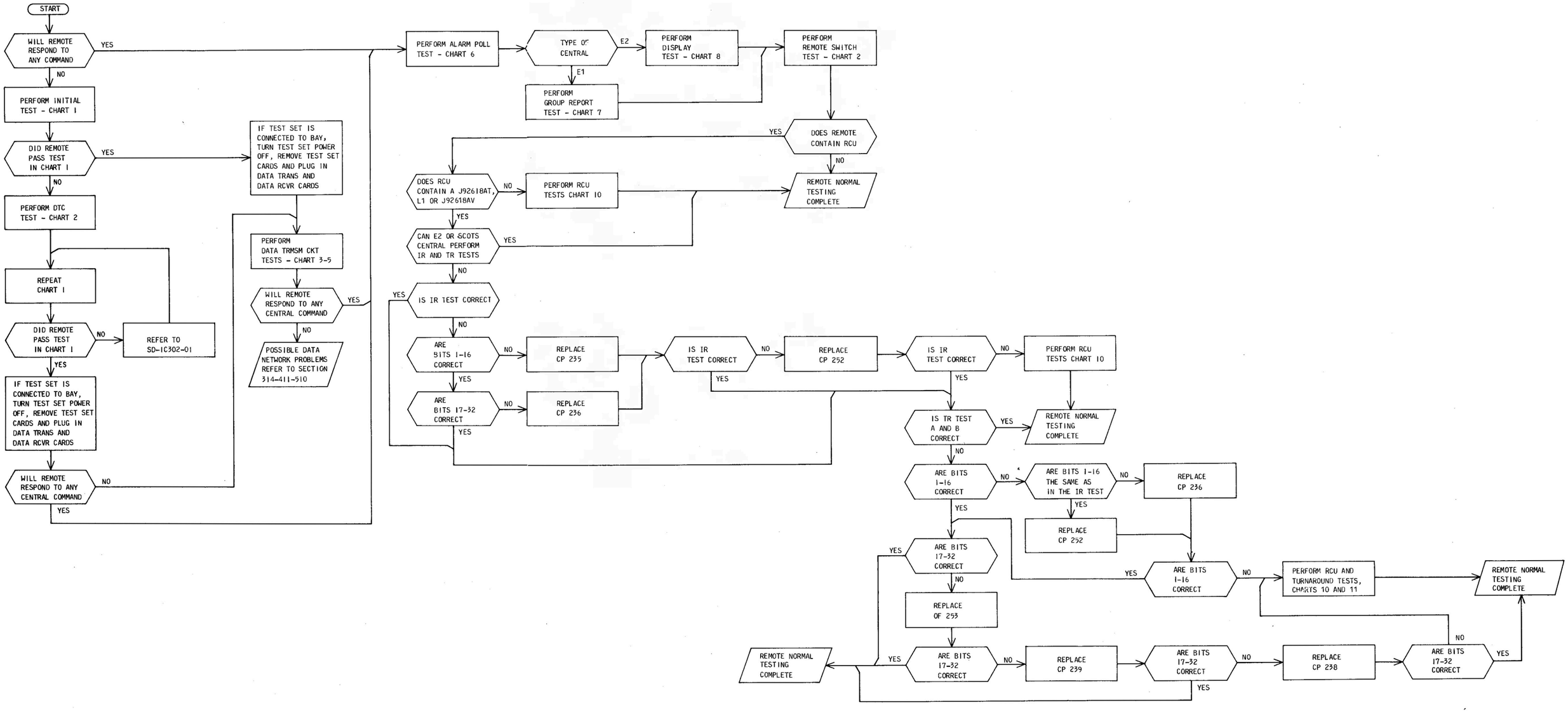
SWITCH	POSITION
SYSTEM	E1/E2
PARITY	B
BIT RATE	150 (if equipped with CP 87) 600 (if equipped with CP 88)
MODE	ONCE
ENABLE	NORMAL
DISPLAY ERROR WORD	OFF
DISPLAY WORD SELECT	1
POWER	ON
MESSAGE LENGTH WORDS	1
RCU	OFF

CHART 11 (Contd)

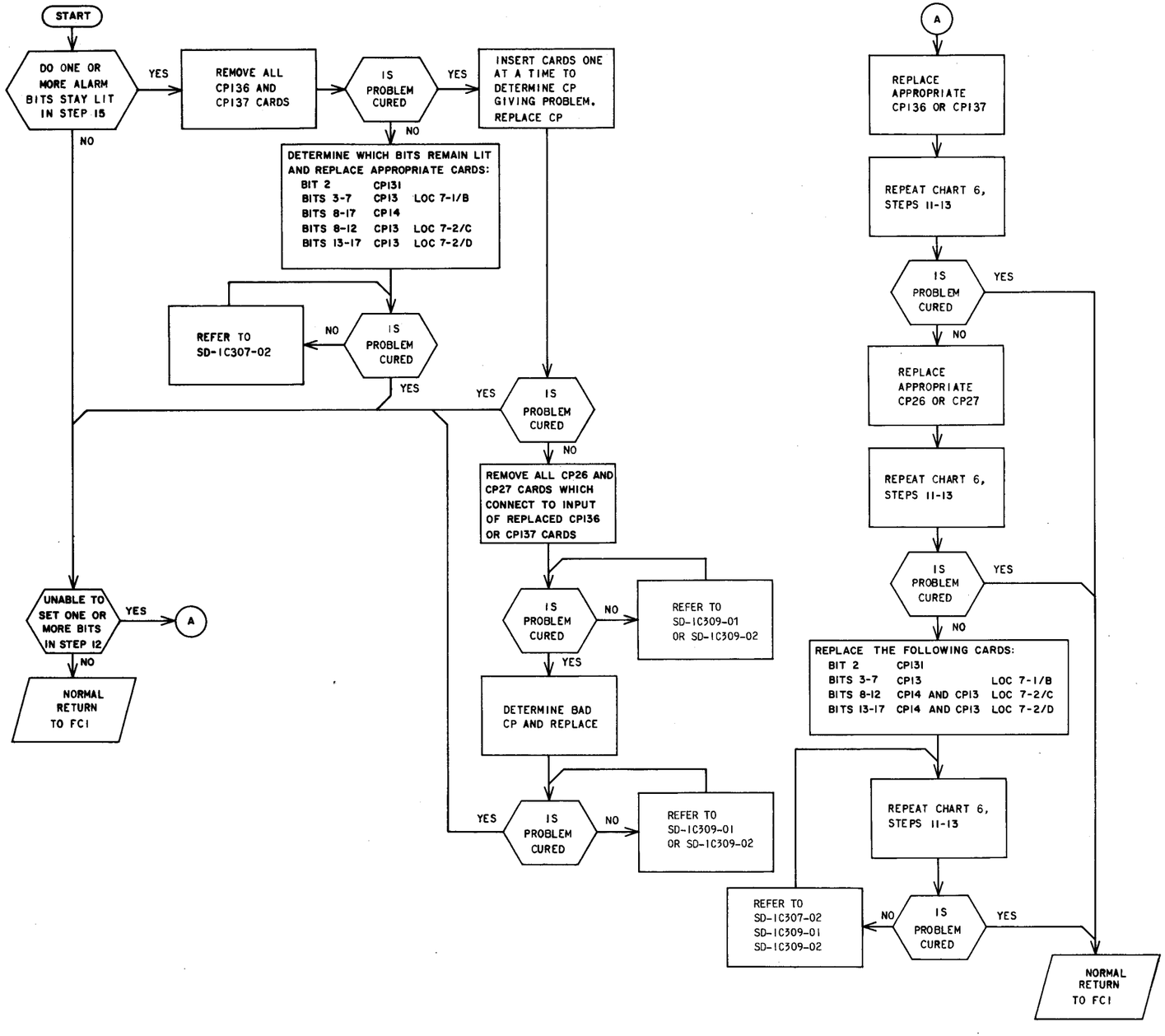
STEP	PROCEDURE
6	Operate all word swithes to the 0 (down) position.
7	Operate word 1 switches to the 1 (up) position, as indicated in Table D.
8	Depress the MASTER CLEAR pushbutton on the test set.
9	Seat the test cable cards.
10	Depress the MASTER CLEAR and then the START pushbuttons.
	Requirement: Lamp 1 on the word RECEIVE indicator should be on (ignore lamp 17).
11	Release all word 1 switches to 0 (down); and operate switches 2, 14, 15, 16, and 17.
12	Depress the MASTER CLEAR and then the START pushbuttons.
13	Place the MESSAGE LENGTH WORDS switch in the 2 position.
14	Release all word switches to 0 (down); and operate word 1 switches 1, 2, 13, 14, and the 1s indicated in Table D. Operate word 2 switches 1, 3, 5, 7, 9, 11, 13, 15, and 17.
15	Depress the MASTER CLEAR and then the START pushbuttons.
16	Place the MESSAGE LENGTH WORDS switch in the 1 position and the DISPLAY WORD SELECT switch to the 2 position.
17	Release word 1 switches to 0 (down), and operate word 1 switches 2, 14, 15, 16, 17, and the 1s indicated in Table D.
18	Depress the MASTER CLEAR and then the START pushbuttons.
	Requirement: Lamps 1, 3, 5, 7, 9, 11, 13, 15, and 17 on the word RECEIVE indicator should be on.
19	Place the DISPLAY WORD SELECT switch to the 1 position.
20	Repeat Steps 5 through 13.
21	Release word 1 and word 2 switches to 0 (down). Operate word 1 switches 1, 2, 13, 14, and the 1s indicated in Table D. Operate word 2 switches 1, 2, 6, 8, 10, 12, 14, 16, and the 1s indicated in Table D.
22	Depress the MASTER CLEAR and then the START pushbuttons.
23	Repeat Steps 16 and 17.

CHART 11 (Contd)

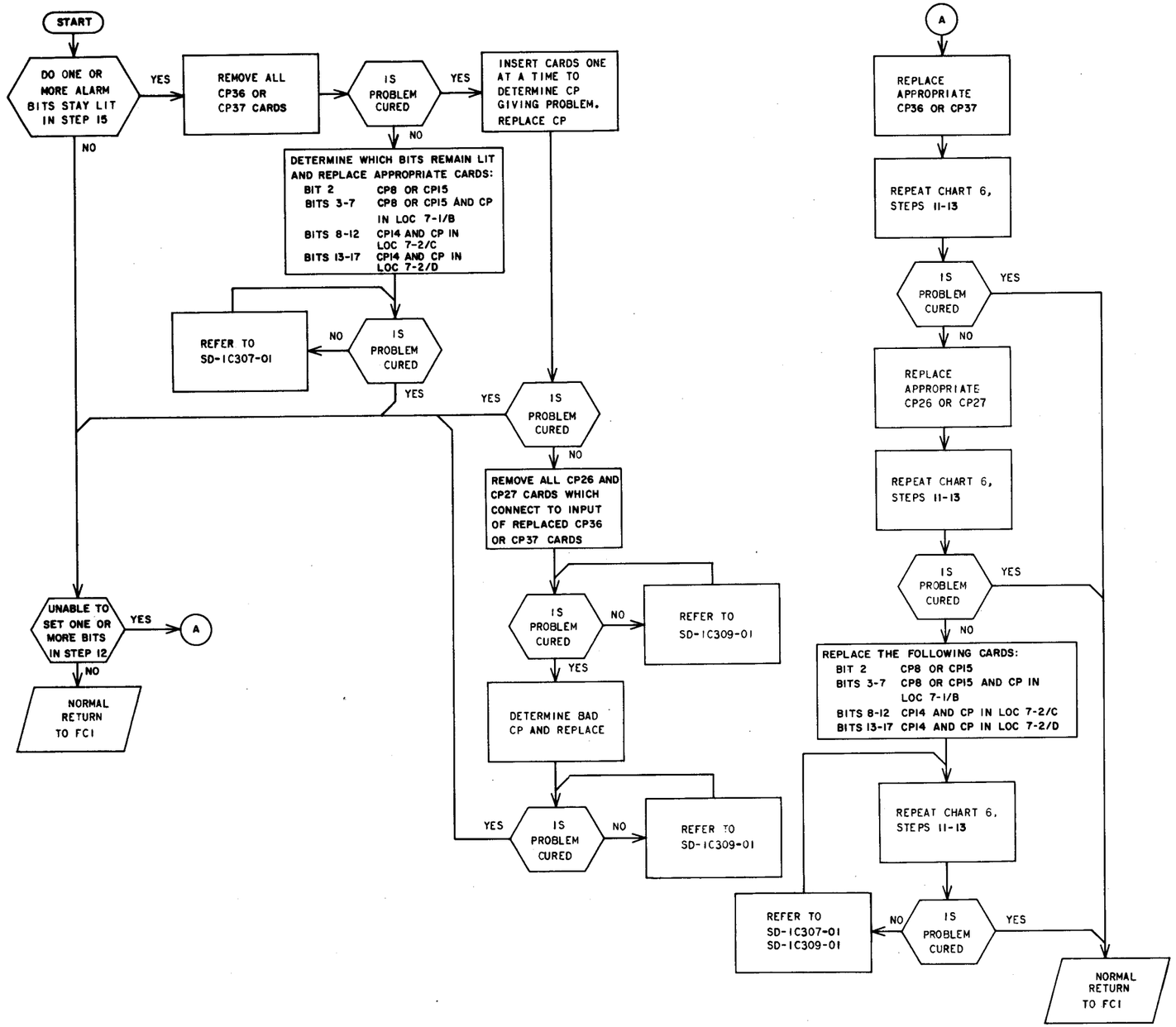
STEP	PROCEDURE
24	Depress the MASTER CLEAR and then the START pushbuttons. ***Requirement:*** Lamps 1, 2, 4, 6, 8, 10, 12, 14, and 16 should light on the RECEIVE INFORMATION display.
25	Return to Flowchart 1 if the remote bay passes all requirements in the preceding test. Go to Flowchart 7, and perform the indicated maintenance if the remote bay failed any requirement.



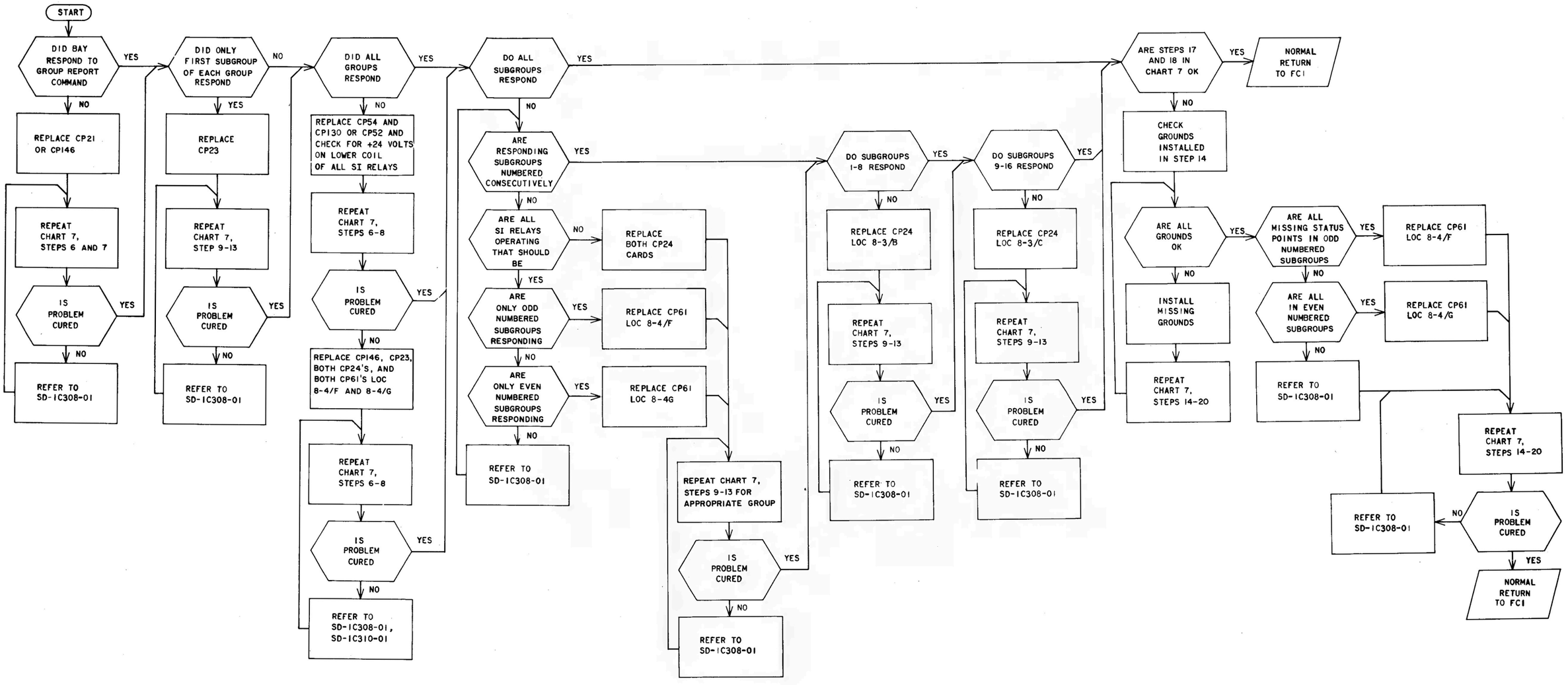
Flowchart 1—Initial Diagnoses



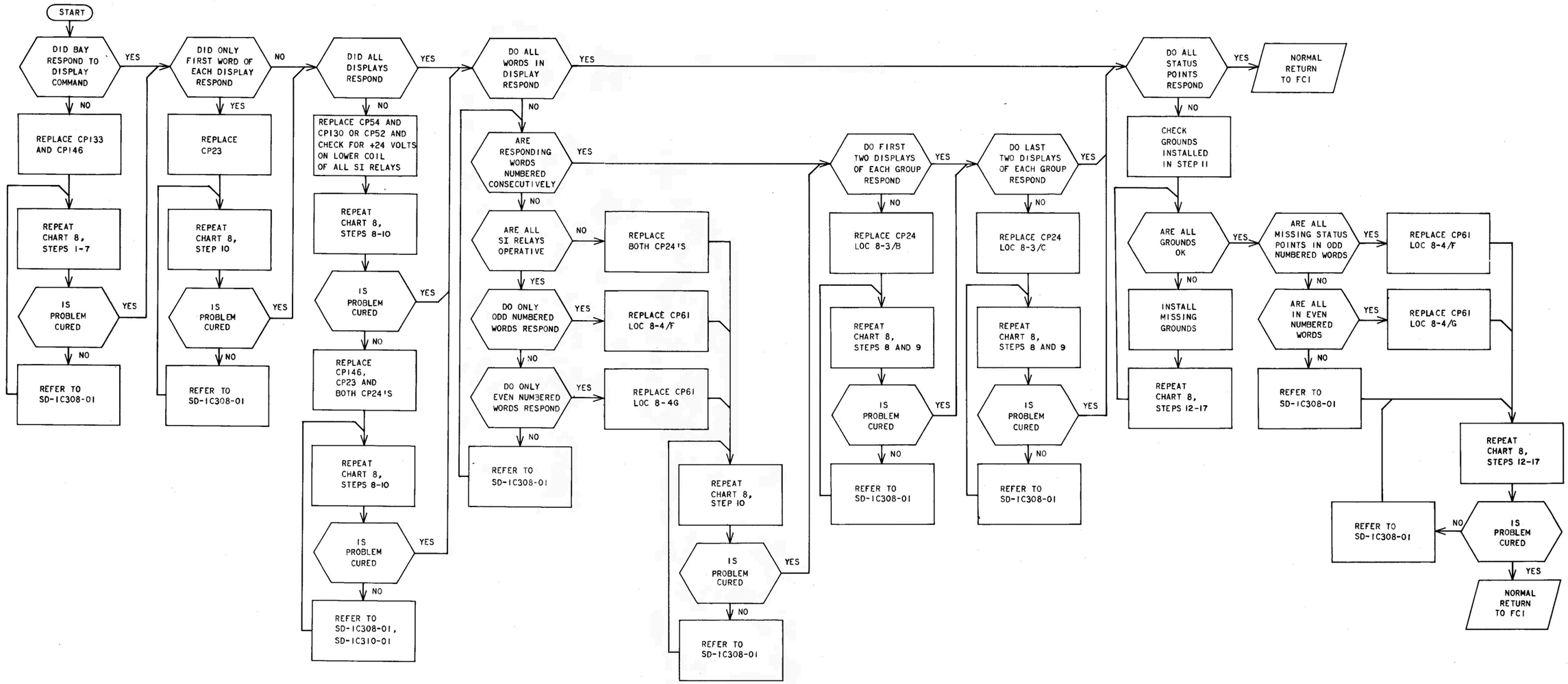
Flowchart 2—Alarm Transmitting Mode (Bays With CP 136 and SD-1C307-02)



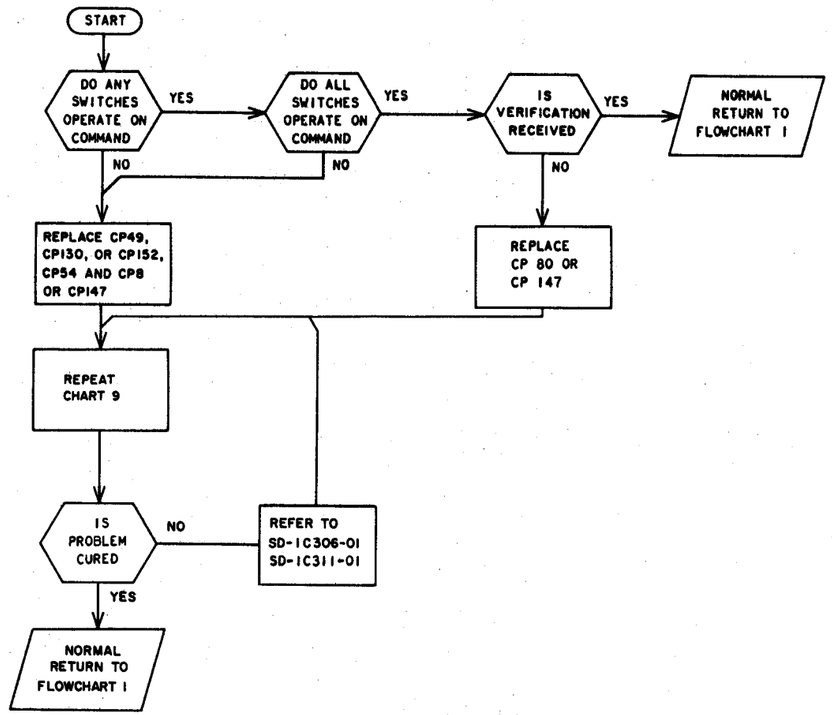
Flowchart 3—Alarm Transmitting Mode (Bays With CP 36 and SD-1C307-01)



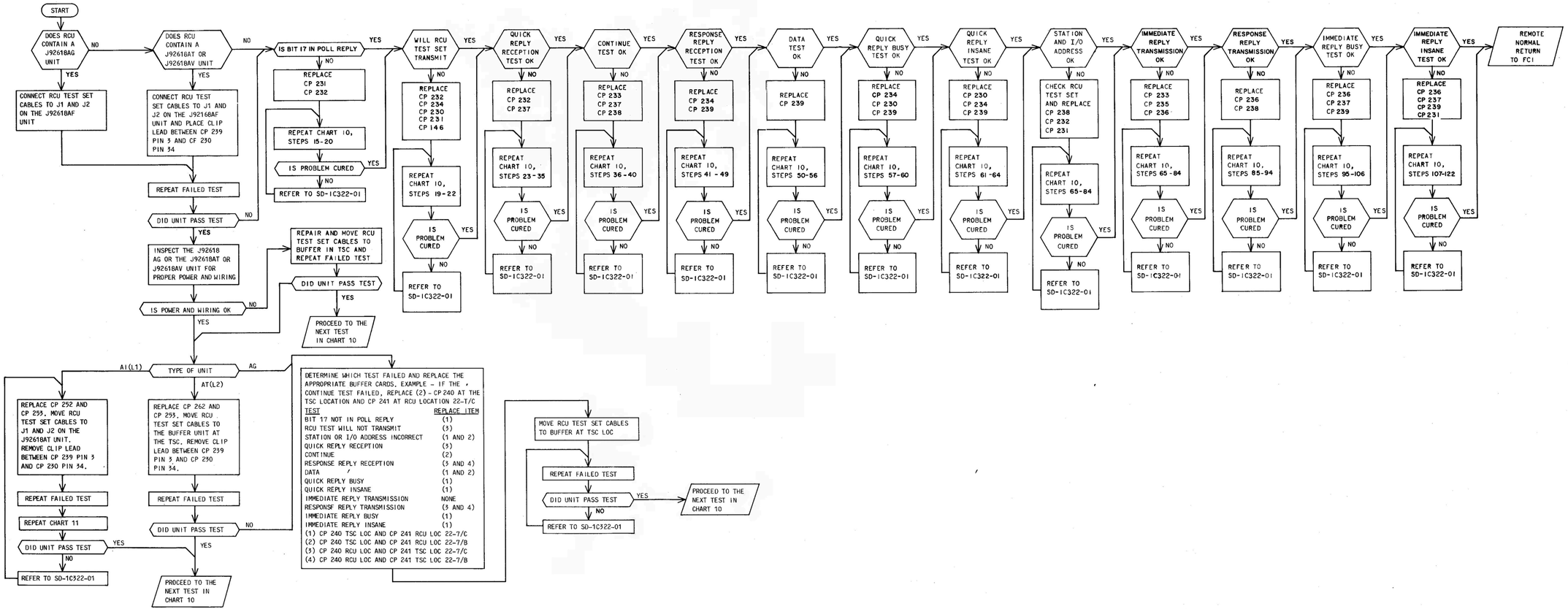
Flowchart 4—Group Transmitting Mode



Flowchart 5—Status Display Remote Mode



Flowchart 6—Remote Switch Mode



Flowchart 7—Remote Callup Mode