

IBM INSTALLATION INSTRUCTIONS

FOR MANUAL

PN 2598260
SHEET 1 OF 7

ENG CHANGE NO DATE OF CHANGE	392635A 18 NOV 70	392657 29 JAN 71	392131 9 JUN 71	392685 31 JULY 71	392698 22 NOV 71																													
<p><u>MACHINE TYPE 5444 - ALL MODELS WITH SERIAL NUMBERS ABOVE 30100 (STEPPING MOTOR FILES)</u></p> <p>THIS DOCUMENT PROVIDES PREPARATION INSTRUCTIONS AND INSTALLATION/REINSTALLATION INSTRUCTIONS FOR A 5444 DISK FILE BEYOND THE POINT OF PHYSICALLY LOCATING THE FILE WITHIN THE HOST SYSTEM, WHICH IS COVERED BY THE HOST SYSTEM INSTALLATION INSTRUCTIONS. ALL INSTRUCTIONS, CHECKS AND ADJUSTMENTS ARE TO BE PERFORMED IN THE SEQUENCE GIVEN UNLESS STATED OTHERWISE.</p> <table border="0"> <thead> <tr> <th></th> <th><u>PAGE</u></th> <th></th> <th><u>PAGE</u></th> </tr> </thead> <tbody> <tr> <td>A. UNPACKING</td> <td>2</td> <td>F. POWER CHECK</td> <td>4</td> </tr> <tr> <td>B. PREPARATION TO INSTALLATION</td> <td>2</td> <td>G. START - STOP SEQUENCE</td> <td>6</td> </tr> <tr> <td>C. MECHANICAL CHECKS</td> <td>3</td> <td>H. HEAD AND TRANSDUCER ALIGNMENT</td> <td>6</td> </tr> <tr> <td>D. HEAD - DISK CHECK</td> <td>3</td> <td>J. DIAGNOSTICS</td> <td>6</td> </tr> <tr> <td>E. INSULATION CHECK</td> <td>4</td> <td>K. COMPLETION</td> <td>7</td> </tr> </tbody> </table> <p><u>SPECIAL TOOLS REQUIRED FOR THIS INSTALLATION</u></p> <table border="0"> <tr> <td>CE CARTRIDGE</td> <td>P/N 2537301</td> </tr> <tr> <td>TEKT 453 OSCILLOSCOPE</td> <td>P/N 453047</td> </tr> </table>								<u>PAGE</u>		<u>PAGE</u>	A. UNPACKING	2	F. POWER CHECK	4	B. PREPARATION TO INSTALLATION	2	G. START - STOP SEQUENCE	6	C. MECHANICAL CHECKS	3	H. HEAD AND TRANSDUCER ALIGNMENT	6	D. HEAD - DISK CHECK	3	J. DIAGNOSTICS	6	E. INSULATION CHECK	4	K. COMPLETION	7	CE CARTRIDGE	P/N 2537301	TEKT 453 OSCILLOSCOPE	P/N 453047
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<p>IF FILE IS ALREADY INSTALLED IN A HOST SYSTEM, OMIT SECTIONS A AND B4.</p> <p><u>A. UNPACKING</u></p> <ol style="list-style-type: none"> UNPACK FILE PER PACKAGING INSTRUCTIONS SUPPLIED. IF FILE IS ALREADY MOUNTED ON A TRAY, PROCEED TO SECTION A5. <u>EXERCISING CAUTION, UNSCREW MOUNTING SCREWS SECURING FILE TO TOP OF SHIPPING BRACKETS, SCREWS ARE ACCESSIBLE TO SPANNER FROM SIDE OF BRACKET. ENSURE RUBBER SHOCK MOUNTS, IF USED, HAVE NOT ADHERED TO CASTING STUDS.</u> <u>WARNING: WITH BASEBOARD REMOVED FILE MUST NOT BE PLACED UPRIGHT ON ANY FLAT SURFACE. IF THERE IS OCCASION TO PLACE FILE ON A SURFACE, FILE SHOULD BE TURNED ON ITS SIDE.</u> SLIT POLYTHENE BAG DOWN THE CENTRE TOP AND DRAW POLYTHENE ASIDE AND DOWN TO CLEAR MACHINE. <p><u>B. PREPARATION TO INSTALLATION</u></p> <ol style="list-style-type: none"> VISUALLY CHECK MACHINE FOR POSSIBLE TRANSIT DAMAGE. ENSURE THAT A.C. VOLTAGE, KVA, FREQUENCY AND PHASE REQUIRED BY FILE (AS STATED ON LABELS ON SIDE OF FILE AND TOP OF AC BOX) IS THE SAME AS THAT SUPPLIED BY THE SYSTEM. REMOVE ALL POWER FROM HOST SYSTEM ENSURING THAT THE "FILE START" SWITCH IS IN THE OFF POSITION. INSTALL FILE INTO HOST SYSTEM ACCORDING TO SYSTEM INSTALLATION INSTRUCTIONS. DO NOT ATTACH ANY POWER CABLES AT THIS TIME. IF CABLES ARE ATTACHED, MAKE CERTAIN THEY ARE DISCONNECTED AT THE SYSTEM/FILE INTERFACE. REMOVE SHIPPING COVER FROM CARTRIDGE CAVITY. 						

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<p>C. MECHANICAL CHECKS</p> <ol style="list-style-type: none"> ENSURE THAT TRANSDUCER PLUGS ARE SECURE. THEY ARE LOCATED ABOVE Y-GATE AND ARE LABELLED J1 AND J2. (REF LOGIC PAGE ZZ 220). CHECK BELT TRACKING AND ENSURE THAT BELT TENSION SYSTEM IS OPERATING CORRECTLY BY ROTATING THE DISK SPINDLE BY HAND. CHECK ALSO THAT THE BELT IS NOT FOULED BY ANY PROJECTING PARTS. (REF FETMM SECTION 3.2). CHECK THAT ALL CARDS AND CONNECTORS IN X-GATE, Y-GATE AND Z-GATE ARE SEATED PROPERLY. PLACE A 6 INCH STEEL RULE ON EDGE ACROSS THE TOP OF THE SPINDLE HUB AND CHECK FOR A MINIMUM CLEARANCE OF 0.003 INCH BETWEEN TRANSDUCER POLE PIECE AND BOTTOM EDGE OF RULE. PERFORM THIS CHECK WITH RULE IN AT LEAST THREE DIFFERENT POSITIONS. IF MINIMUM CLEARANCE IS NOT MET, PERFORM TRANSDUCER ADJUSTMENT AS PER FETMM SECTION 3.5.2.1. <p>D. HEAD-DISK CHECK</p> <ol style="list-style-type: none"> REMOVE ACTUATOR COMPARTMENT TOP COVER FROM FILE. INSPECT BASE CASTING AND CLEAN AS NECESSARY. CHECK ACTUATOR PACKAGING LOCKOUT BRACKET, IDENTIFIED BY A LABEL IN THE CARRIAGE AREA. REMOVE, IF STILL FITTED, BY REMOVING FIXING SCREWS AND TRANSISTOR COVER, AND RETAIN FOR FUTURE SHIPMENT. REPLACE TRANSISTOR COVER AND SCREWS. CHECK ALL READ/WRITE HEADS FOR DAMAGE (REF FETMM SECTION 2.4.4.1. AND 3.8.2.2.). CLEAN ALL READ/WRITE HEADS (REF FETMM SECTION 2.4.4.2. AND 2.4.4.3). CLEAN FIXED DISK (REF FETMM SECTION 3.3.2.2.). CHECK THAT ALL HEAD LOAD SPRINGS ARE SEATED PROPERLY ON THE DIMPLES OF THE READ/WRITE HEAD ASSEMBLIES. ALSO CHECK THAT ALL HEAD PLUGS ARE SECURE. (REF FETMM DIAGRAM IN SECTION 3.8.2). INSPECT CE CARTRIDGE FOR SHIPPING DAMAGE IF SHIPPED. 						

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<ol style="list-style-type: none"> CHECK THAT CARRIAGE AND BRUSHES ARE IN RETRACTED POSITION, THEN INSERT CE CARTRIDGE AND CLOSE CARTRIDGE CLAMPS. <p>CAUTION: IN STEPS 8, 9 AND 10 DO NOT LET THE NUT WHEEL DISENGAGE FROM THE LEADSCREW BY ENSURING THAT THE CARRIAGE DOES NOT MOVE BEYOND THE APPROPRIATE INTERLOCK MICROSWITCHES. IF NECESSARY, THE NUT WHEEL CAN BE RE-ENGAGED ACCORDING TO FETMM SECTION 3.7.9.2.</p> <ol style="list-style-type: none"> CHECK THAT THE THRUST RACE AT THE CARTRIDGE END OF THE LEADSCREW IS CORRECTLY ALIGNED. IF THE THRUST RACE IS PARTIALLY DISENGAGED, RE-ALIGN BY APPLYING A LIGHT FORCE TO CORRECT THE ALIGNMENT AT THE THRUST RACE WITH ONE HAND WHILST SLOWLY TURNING THE STEPPING MOTOR SHAFT IN AN ANTICLOCKWISE DIRECTION WITH THE OTHER HAND. CAREFULLY MOVE CARRIAGE FORWARD INTO DISK CARTRIDGE BY ROTATING THE LEADSCREW COUPLING (REF FETMM DIAGRAM IN SECTION 3.7.3) IN AN ANTICLOCKWISE DIRECTION. ENSURE THAT THERE IS NO INTERFERENCE BETWEEN HEADS, HEAD CABLES AND DISK. (REF FETMM DIAGRAM IN SECTION 3.8.2 FOR CORRECT ROUTING OF HEAD CABLES.) MOVE CARRIAGE TO OVERRUN POSITION. RETURN CARRIAGE TO RETRACTED POSITION. REPLACE TOP COVER ON FILE WITHOUT REPLACING SCREWS. <p>E. INSULATION CHECK</p> <ol style="list-style-type: none"> CONNECT AC CABLES BETWEEN FILE AND SYSTEM. POSITION FILE AT NORMAL OPERATING POSITION IN ENCLOSURE. MEASURE RESISTANCE BETWEEN AC BOX FRAME AND TB3-5 (REF LOGIC PAGE ZA 210). RESISTANCE SHOULD BE 0.5 MEGOHMS OR GREATER. IF BELOW 0.5 MEGOHMS, AC - DC SHORT EXISTS. THIS SHORTED CONDITION MUST BE REMOVED BEFORE PROCEEDING. ADJUSTMENT OF THE FILE POSITION MAY REMOVE SHORT, SINCE CASTING IS DC GROUND (TB3-5) AND SYSTEM ENCLOSURE IS NORMALLY AC GROUND (AC BOX FRAME). 						

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<p>F. POWER CHECK</p> <ol style="list-style-type: none"> DISCONNECT AC POWER AT SYSTEM/FILE INTERFACE. CONNECT DC AND FLAT TAPE CABLE BETWEEN FILE AND HOST SYSTEM PER SYSTEM INSTALLATION INSTRUCTIONS. SET OVERRIDE ON ANY RELEVANT SYSTEM INTERLOCK SWITCHES. SWITCH ON DC POWER AT SYSTEM AND CHECK DC VOLTAGES ON TB3 REFERENCED TO LOGIC GROUND. (REF LOGIC PAGES ZZ210 AND ZA210.) <table style="margin-left: 40px;"> <tr> <td>TB3-1 = + 6.00V ± 0.48V</td> <td>TB3-7 = +24.0V ± 2.4V</td> </tr> <tr> <td>TB3-2 = - 4.0V ± 0.32V</td> <td>TB3-8 = DRIVER COMMON (±0.5V FROM LOGIC GROUND)</td> </tr> <tr> <td>TB3-3 = -30.0V ± 6.1V - 5.1V</td> <td></td> </tr> <tr> <td>TB3-4 = +24.0V ± 2.4V</td> <td></td> </tr> <tr> <td>TB3-5 = LOGIC GROUND</td> <td></td> </tr> </table> <p>CHECK FOR ±18V AT Y-GATE AS FOLLOWS:</p> <table style="margin-left: 40px;"> <tr> <td>ANY D03 PIN EXCEPT M AND N SOCKETS = +18.00 ± 0.54V</td> </tr> <tr> <td>Y-WIN6D10 = -18.00 ± 0.54V</td> </tr> </table> CHECK THAT THE THREE LAMPS IN THE ENCODER LAMP ASSEMBLY (REF FETMM DIAGRAMS IN SECTION 3.7.4) AND CARRIAGE LAMPS ARE LIT (REF LOGIC PAGE ZZ200). POWER DOWN SYSTEM. REMOVE COVER ON AC BOX. RECONNECT AC AT SYSTEM/FILE INTERFACE. 							TB3-1 = + 6.00V ± 0.48V	TB3-7 = +24.0V ± 2.4V	TB3-2 = - 4.0V ± 0.32V	TB3-8 = DRIVER COMMON (±0.5V FROM LOGIC GROUND)	TB3-3 = -30.0V ± 6.1V - 5.1V		TB3-4 = +24.0V ± 2.4V		TB3-5 = LOGIC GROUND		ANY D03 PIN EXCEPT M AND N SOCKETS = +18.00 ± 0.54V	Y-WIN6D10 = -18.00 ± 0.54V
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<ol style="list-style-type: none"> CHECK THAT AC VOLTAGE BETWEEN TB1-1 (LINE) AND TB1-3 (LINE/NEUTRAL) IS THE SAME AS THAT SPECIFIED BY VOLTAGE INFORMATION LABEL ON FILE. (REFER LOGIC PAGES ZZ220 AND ZA200 FOR POSITION OF TB-1.) REPLACE AC BOX COVER. <p>G. START-STOP SEQUENCE</p> <ol style="list-style-type: none"> SWITCH SYSTEM "FILE START" ON. CHECK THAT FILE GOES THROUGH START UP SEQUENCE CORRECTLY. (REF FETMM CHAPTER 1). SELECT "50 TRACK" POSITION ON FILE CE ROTARY SWITCH. ACCESS FORWARD TO THE INNER LIMIT AND RETURN TO HOME (TRACK 000) USING FORWARD-REVERSE TOGGLE SWITCH. SWITCH "FILE START" OFF AND CHECK THAT FILE GOES THROUGH STOP SEQUENCE CORRECTLY. (REF FETMM CHAPTER 1). <p>H. HEAD AND TRANSDUCER ALIGNMENT</p> <ol style="list-style-type: none"> REMOVE TOP COVER FROM FILE. CHECK ALIGNMENT OF HEADS 00 AND 01 (REF FETMM SECTION 3.8.2.3). CHECK CIRCUMFERENTIAL SETTING OF THE UPPER INDEX TRANSDUCER (REF FETMM SECTION 3.5.2.2). STOP FILE AND INSPECT ALL HEADS (REF FETMM SECTION 2.4.4.1). REPLACE TOP COVER AND TIGHTEN SCREWS. <p>J. DIAGNOSTICS</p> <ol style="list-style-type: none"> PLACE FILE UNDER SYSTEM CONTROL BY SWITCHING CE ROTARY SWITCH TO "ON LINE" POSITION. 						

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<p>2. PLACE FILE IN NORMAL OPERATING POSITION, INSTALL SYSTEM COVERS, AND REMOVE ANY OVERRIDES TO SYSTEM INTERLOCK SWITCHES.</p>						
<p>3. ON MODELS 1 AND 2 RUN THE CE INITIALISATION PROGRAM UNDER THE FOLLOWING CONDITIONS:</p>						
<p>(1) FIXED DISK ONLY. (2) ALL TRACKS - DO NOT BYPASS CE ALIGNMENT CYLINDERS. (3) FIVE CONSECUTIVE PASSES OF INITIALISATION.</p>						
<p>IF ANY ALTERNATIVE TRACK IS ASSIGNED THE FIXED DISK MUST BE REPLACED AS PER FETMM SECTION 3.3.2.4.</p>						
<p>4. ON ALL MODELS, TEST FILE OPERATION FULLY BY RUNNING DIAGNOSTIC PROGRAMS, A MODEL 3 REQUIRING AN INITIALISED CE DISK PACK.</p>						
<p><u>K.</u> COMPLETION</p>						
<p>1. REMOVE CE CARTRIDGE.</p>						
<p>2. INSTALLATION OF 5444 COMPLETE.</p>						
<p>3. PLACE INSTALLATION INSTRUCTIONS IN LOGIC BINDER AFTER USE FOR FUTURE REFERENCE.</p>						

0031-2 MACH LIST FOR-5444 MOD-002 SER- 48460 PLT-10 REQSTR INITIAL HISTORY 05JAN73
 E-#-14922R CTRY- CUST-7735116- SER BR-G02 SYS#- - -04602 TYP-3006
 SD-05JAN73 SHIPPED- SHP SEQ-A0014 FCT SEQ-B0012 W/D SUF- P3 MACH STA-FACTRY

MRS NO	SEQ#	EC#	STATUS	FLD B/M	FCSI #	TIME	ECA#	DATE
0029	A0014	392681	PRES LVL					

0033	B0012 FCT	UNUSED	FACT LVL					
0035	B0013 FCT	392720A	INQUIRY* <i>inst</i>					

0000	R0002 REA	CR02977	INSTALLD					
0000	P0003 REA	CR01834	INSTALLD					
0000	R0004 REA	CR19563	INSTALLD					
0000	R0007 REA	6201947	INSTALLD					
0000	R0008 REA	6201951	INSTALLD					
0000	R0010 REA	1308248	INSTALLD					
0000	R0011 REA	1308249	INSTALLD					
0000	R0016 REA	6201950	INSTALLD					
0000	R0018 REA	6201985	INSTALLD					
0000	R0019 REA	6203709	INSTALLD					
0000	R0020 REA	6203708	INSTALLD					
0000	R0021 REA	6201635	INSTALLD					
0000	R0022 REA	6201669	INSTALLD					
0000	R0023 REA	1012352	INSTALLD					
0000	R0026 REA	6203758	INSTALLD					
0000	R0034 REA	1019320	INSTALLD					
	<i>REA 10-19316 inst</i>							

0032	Y0004 OPT	392710	INQUIRY*					
0034	Y0005 OPT	392723	INQUIRY* <i>inst</i>					

MRS NO	FEAT BM	QTY	FEATURE NAME	STATUS	DATE	ACC	SHP-LVL-FCT
	SEQ#	EC#	STATUS	FLD B/M	FCSI #	TIME	ECA# DATE
	0777780	001 208	VOLT 60 CY			JAN73	D0001 E0000
	D0001	333333	PRES LVL				
0010	2538100	001	FINAL ASSY STEPPER			JAN73	D0004 E0000
	D0004	392072	PRES LVL				
	2593209	001	SYS 3 HARDWARE GROUP			JAN73	D0001 E0000
	D0001	818414	PRES LVL				
	2598103	001	GRP BM INFO PLATES			JAN73	D0001 E0000
	D0001	392129	PRES LVL				
0029	2600578	001	SHIP GROUP STEPPER			JAN73	D0006 E0001
	D0006	392681	PRES LVL				
0002	E0001 FCT	392644	FACT LVL				
0035	E0002 FCT	392720A	INQUIRY*				
0029	2601509	001	MODEL 002 COMPLETION GRP			JAN73	D0007 E0000
	D0007	392681	PRES LVL				
	5144434	001 230	VOLT 60 CY			JAN73	D0001 E0000
	D0001	888888	PRES LVL				

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RELEASED FOR ASM	QTY	TECHNICAL APPROVAL	SYM	DATE	CHANGE NO	SYM	DATE	CHANGE NO	5144460
				4 FEB 72	392706B				
									DEVELOPMENT NO
									Q/M

THIS DWG PROVIDES REPLACEMENT SECTIONS 3.9.1 & 3.9.5 FOR 5444 FETM SY 33-0029-1

REFERENCE DRAWING SHEET 1 OF 2

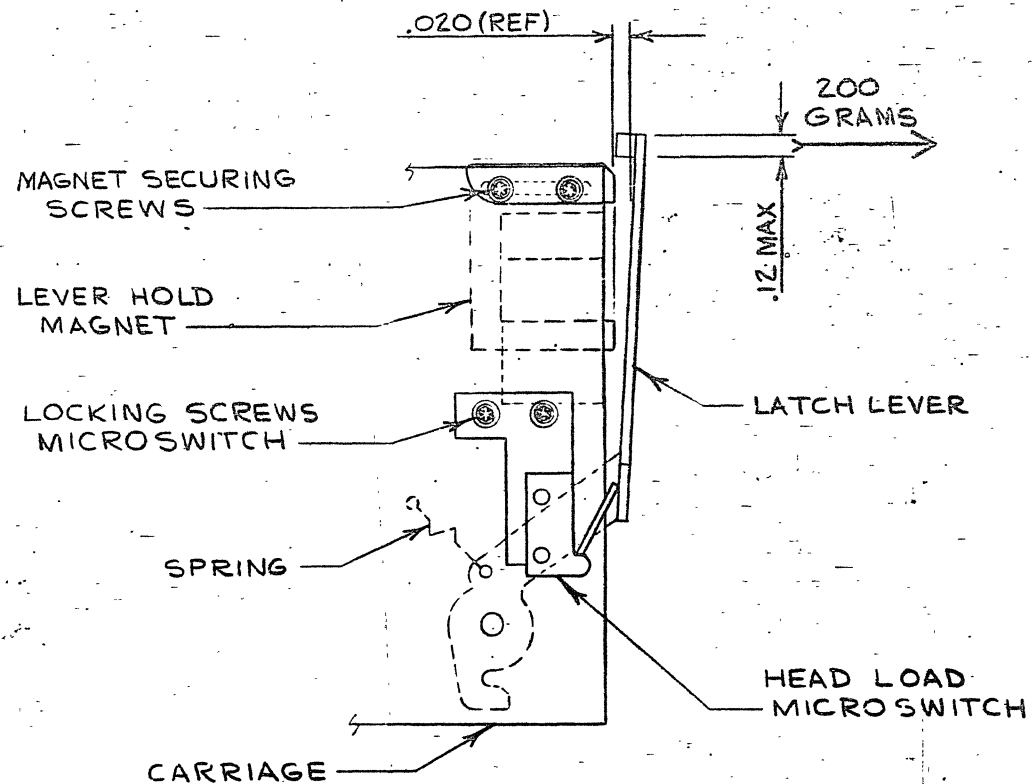


FIGURE 1

3.9.5 HEAD LOAD MICROSWITCH ADJUSTMENT

- 1 REMOVE ALL POWER FROM THE 5444. DISCONNECT THE STEPPING-MOTOR PLUG P3 FROM SOCKET J3 (ZZ220).
- 2 CONNECT A JUMPER FROM PIN Y-WIF6307 TO GROUND.
- 3 REMOVE TOP COVER AND ENCODER DISK COVER.
- 4 MOVE CARRIAGE FORWARD BY ROTATING THE STEPPING MOTOR SHAFT COUNTERCLOCKWISE TO ALLOW ACCESS TO HEAD LOAD MICROSWITCH LOCKING SCREWS.
- 5 SLACKEN THE HEAD LOAD MICROSWITCH LOCKING SCREWS. THE ADJUSTING PLATE IS NOW FREE TO MOVE. MOVE CARRIAGE TO THE FULLY RETRACTED POSITION.
6. TURN ON POWER AND START THE 5444.
NOTE: THE BRUSH MOTOR WILL NOW CYCLE CONTINUOUSLY, ENABLING THE CAM HOLD MAGNET TO BE ENERGIZED AFTER THE BRUSH MOTOR HAS COMPLETED THE FIRST FORWARD CYCLE.
7. MOVE THE CARRIAGE TO TRACK 100 BY ROTATING THE STEPPING MOTOR SHAFT COUNTERCLOCKWISE. PLACE .020 (0,51) GAUGE BETWEEN HEAD LOAD LEVER AND UPPER POLE PIECE OF HEAD LOAD MAGNET. (SEE FIGURE 1). THE LEVER CAN BE UNLOADED MANUALLY TO ALLOW INSERTION OF .020 (0,51) GAUGE.
- 8 ADJUST THE HEAD LOAD MICROSWITCH SO THAT IT JUST OPERATES. TIGHTEN THE LOCKING SCREWS AND CHECK THAT THE MICROSWITCH IS STILL IN THE OPERATED POSITION.
NOTE: FOR VISUAL INDICATION OF WHEN THE SWITCH IS OPERATED, DISCONNECT P6 (REF ZZ200). CONNECT CE METER ACROSS P6-3 AND P6-4 POINTS, RXI SCALE. WHEN THE SWITCH IS IN THE OPERATED POSITION, IT WILL READ INFINITY
- 9 MANUALLY UNLOAD THE LATCH LEVER PAST THE TRANSFER POINT OF THE SWITCH. INSERT .040 (1,02) GAUGE BETWEEN HEAD LOAD LEVER AND UPPER POLE PIECE. CHECK THAT THE MICROSWITCH IS IN THE NON-OPERATED POSITION. IF THE MICROSWITCH IS IN THE OPERATED POSITION, REPEAT STEPS 7 AND 8.
- 10 RETURN THE CARRIAGE TO TRACK 0.
- 11 REMOVE THE JUMPER FROM Y-WIF6B07 AND WAIT UNTIL THE BRUSH ARM IS IN THE PARKED POSITION.
- 12 SWITCH OFF THE 5444.
- 13 REFIT THE TOP COVER AND ENCODER DISK COVER.

IBM MATERIAL NO		0 1 2 0 25.4 50.8		MUST CONFORM TO ENG SPEC: 890350			IBM		
IBM MATL ALTERNATE NO		SCALE NONE		TOLERANCES UNLESS OTHERWISE NOTED					
CASE DEPTH		THIRD ANGLE PROJECTION		LINEAR ±			DESIGNER		
SURFACE TREATMENT		INCH mm		ANGLES ±			DETAILER		
C		← INCH → ← mm →		RADI UNLESS OTHERWISE NOTED			DWG CHK		
0944460				EDGE/CORNER BREAKS			DSGN APPRO		
				OUTSIDE MAX			CLASSIFICATION		
				INSIDE MAX					

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		ELEC		4 FEB 72	392706B				
		MEAL							DEVELOPMENT NO
		PLASTIC							Q/M

REFERENCE DRAWING

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3.9.1 MECHANISM ADJUSTMENT

- 1 REMOVE ALL POWER FROM THE 5444. DISCONNECT THE STEPPING MOTOR PLUG P3 FROM SOCKET J3 (ZZ220).
 - 2 REMOVE THE TOP COVER AND ENCODER DISK COVER.
 - 3 CHECK THAT THE CARRIAGE IS IN THE FULLY RETRACTED POSITION.
 - 4 CHECK THAT THE CAM HOLD MAGNET IS AGAINST THE CAM HOLD LEVER AND THAT THE TWO POLES OF THE MAGNET ARE IN CONTACT WITH THE LEVER.
 - 5 CONNECT A JUMPER FROM PIN Y-WIF6B07 TO GROUND.
 - 6 TURN ON POWER AND START THE 5444.
- NOTE: THE BRUSH MOTOR WILL NOW CYCLE CONTINUOUSLY, ENABLING THE CAM HOLD MAGNET TO BE ENERGIZED AFTER THE BRUSH MOTOR HAS COMPLETED THE FIRST FORWARD CYCLE.
- 7 MOVE THE CARRIAGE MANUALLY TO TRACK 100 BY TURNING THE STEPPING MOTOR SHAFT COUNTERCLOCKWISE.
 - 8 LOOSEN THE TWO SECURING SCREWS ON THE LEVER HOLD MAGNET ALLOWING THE TWO POLES OF THE MAGNET TO CONTACT THE LATCH LEVER. LOCK THE SECURING SCREWS (INSURE LATCH LEVER REMAINS IN CONTACT WITH THE TWO POLES OF THE MAGNET).
 - 9 SLACKEN OFF THE HEAD LOAD MICROSWITCH LOCKING SCREWS.
 - 10 PLACE .020 (0,51) GAUGE BETWEEN HEAD LOAD LEVER AND UPPER POLE PIECE OF HEAD LOAD MAGNET. (SEE FIGURE 1). THE LEVER CAN BE UNLOADED MANUALLY TO ALLOW INSERTION OF .020 (0,51) GAUGE.
 - 11 ADJUST THE HEAD LOAD MICROSWITCH SO THAT IT JUST OPERATES. TIGHTEN THE LOCKING SCREWS AND CHECK THAT THE MICROSWITCH IS STILL IN THE OPERATED POSITION.

NOTE: FOR A VISUAL INDICATION OF WHEN THE SWITCH IS IN THE OPERATED POSITION, DISCONNECT P6 (REF ZZ200). CONNECT CE METER ACROSS P6-3 AND P6-4 POINTS, RX1 SCALE. WHEN THE SWITCH IS IN THE OPERATED POSITION, IT WILL READ INFINITY.

- 12 MANUALLY UNLOAD THE LATCH LEVER PAST THE TRANSFER POINT OF THE SWITCH. INSERT .040 (1,02) GAUGE BETWEEN HEAD LOAD LEVER AND UPPER POLE PIECE. CHECK THAT THE MICROSWITCH IS IN THE NON-OPERATED POSITION. IF THE MICROSWITCH IS IN THE OPERATED POSITION, REPEAT STEPS 10 AND 11.
- 13 SWITCH OFF 5444. REMOVE JUMPER FROM Y-WIF6B07. RECONNECT PLUG P3 TO SOCKET J3 (ZZ220).
- 14 POWER UP 5444. ALLOW 5444 TO CYCLE THROUGH NORMAL POWER UP SEQUENCE.
- 15 CHECK THAT A 200 GRAM FORCE APPLIED TO THE TOP OF THE HEAD LOAD LEVER AS INDICATED IN THE FIGURE, DOES NOT CAUSE THE HEAD LOAD LEVER TO BE FORCED AWAY FROM THE HEAD LOAD SOLENOID POLE PIECES. IF THE HEAD LOAD LEVER IS FORCED AWAY FROM THE HEAD LOAD LEVER SOLENOID, REPEAT MECHANISM ADJUSTMENT WITH PARTICULAR CARE TO ITEM 8.
- 16 REFIT THE TOP COVER AND ENCODER DISK COVER.

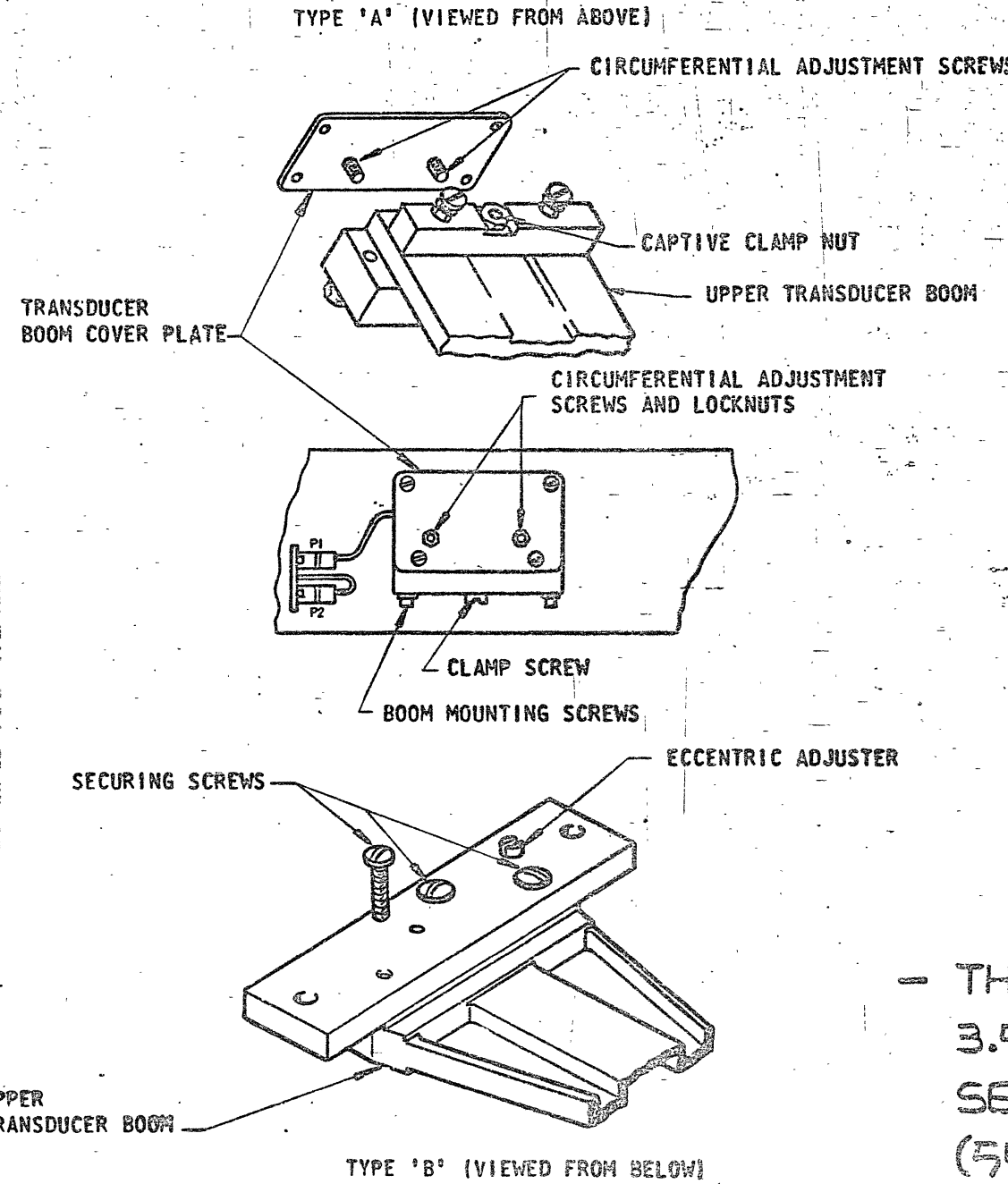
IBM MATERIAL	NO		MUST CONFORM TO ENG SPEC: 890350		IBM	
IBM MATL ALTERNATE	NO		TOLERANCES UNLESS OTHERWISE NOTED	INCH	mm	NAME
CASE DEPTH			LINEAR ±		DESIGNER	
HARDNESS			ANGLES ±			DETAILER
SURFACE TREATMENT		THIRD ANGLE PROJECTION	RADII UNLESS OTHERWISE NOTED		DWG CHK	GMP 10 MAR 72
		INCH	EDGE/CORNER BREAKS	OUTSIDE MAX	DSGN APPRO	WB 10 MAR 72
		mm		INSIDE MAX	CLASSIFICATION	JW 10 MAR 72

0944460 C 5144460

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RELEASED FOR ASM	QTY	TECHNICAL APPROVAL	SYM	DATE	CHANGE NO	SYM	DATE	CHANGE NO	5144461
		ELEC		29 FEB 72	392137				DEVELOPMENT NO Q/M
		METAL		6 APR 72	392137A				
		PLASTIC							

REFERENCE DRAWING
SHEET 1 OF 2 SHEETS



3.5.2.2. CIRCUMFERENTIAL CHECK AND ADJUSTMENT

- 1 INSERT THE CE CARTRIDGE PART 2537301 (SEE ITEM 2.3.3.3 IN CHAPTER 2).
- 2 START THE 5444 OR 62DS DISK FILE AND LOAD TO TRACK 000.
- 3 SET THE CE MOD-SELECT SWITCH TO 1 TRK AND THE FORWARD/REVERSE SWITCH TO FORWARD. GO TO TRACK 005.
- 4 SET THE CE MODE-SELECT SWITCH TO HDD OR HDJ.
- 5 SET THE TEKTRONIX 453 OSCILLOSCOPE (USING X1 PROBE) AS FOLLOWS:

A SWEEP MODE	TO	NORM TRIG	
LEVEL	TO	0 (A TRIGGERING)	
SLOPE	TO	+ (A TRIGGERING)	
COUPLING	TO	AC (A TRIGGERING)	
SOURCE	TO	EXT (A TRIGGERING)	
MODE	TO	ADD	
TRIGGER	TO	NORM	
CH1 VOLTS/DIV	TO	CAL 50MV	
CH2 VOLTS/DIV	TO	CAL 50MV (INVERT)	
CH1 AND CH2			
INPUT	TO	AC	
A TIME/DIV	TO	5 μ S	
CH1 PROBE	TO	PIN Y - WI	62DS ALD PAGE SN560, 5444 ALD PAGE FS260.
		K6J12	
CH2 PROBE	TO	PIN Y - WI	
		K6J10	
EXT TRIG	TO	PIN Y - WI A6D06	
INPUT PROBE		(62DS ALD PAGE SN 610) (5444 ALD PAGE FS 340)	

- THIS DRAWING SUPERCEDES SECTION 3.5.22 OF 62 DS & 5444, FETMM & MAP'S SERVICE CHECK 1 B, PAGE 850 P/N 2600596 (5444) OR PAGE 850 P/N 5144552 (62 DS) -

SHS2J01 IHS
SHT 1 OF 2 SHS
1944416 C

IBM MATERIAL	NO	0 1 2 0 25.4 50.8	MUST CONFORM TO ENG SPEC: 890350			IBM		
IBM MATL ALTERNATE	NO		SCALE	TOLERANCES UNLESS OTHERWISE NOTED	INCH	mm	NAME	TDSR ADJ
CASE DEPTH		THIRD ANGLE PROJECTION	LINEAR \pm			FOR FETMM		
HARDNESS			ANGLES \pm				DESIGNER	HSH 24 FEB 72
SURFACE TREATMENT		INCH mm	RADII UNLESS OTHERWISE NOTED			DETAILER	JHB 24 FEB 72	
			EDGE/CORNER BREAKS	OUTSIDE MAX			DWG CHK	AT 25 FEB 72
			INSIDE MAX			DSGN APPRO		
						CLASSIFICATION		

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RELEASED FOR ASM	QTY	TECHNICAL APPROVAL	SYM	DATE	CHANGE NO.	SYM	DATE	CHANGE NO.
		ELEC		29 FEB 72	392137			
		METAL		6 APR 72	392137A			
		PLASTIC						

5144461

DEVELOPMENT NO. Q/M

REFERENCE DRAWING SHEET 2 OF 2 SHEETS

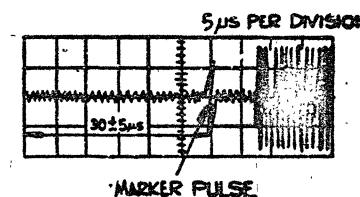
3.5.2.2. (CONT'D)

NOTE:

FOR FILES FITTED WITH TRANSDUCER BOOM TYPE A, CARRY OUT STEP 6.
FOR FILES FITTED WITH TRANSDUCER BOOM TYPE B, CARRY OUT STEP 7.

- 6a** THE OSCILLOSCOPE DISPLAY SHOULD RESEMBLE THAT SHOWN; THE MARKER PULSE, WHICH PRECEDES A TRAIN OF PULSES BY 10 μ S, SHOULD OCCUR 30 μ S \pm 5 FROM THE START OF THE TRACE.
- b** TO ADJUST THE MARKER PULSE, LOOSEN THE LOCKNUTS OF THE CIRCUMFERENTIAL ADJUSTMENT SCREWS, BACK OFF ONE CIRCUMFERENTIAL ADJUSTMENT SCREW AND TIGHTEN THE OTHER SCREW SO THAT THE BOOM IS PIVOTED ABOUT THE CLAMP SCREW. (IF THE RIGHT-HAND SCREW IS BACKED OFF AND THE LEFT-HAND SCREW IS TIGHTENED, THE MARKER PULSE IS MOVED TOWARDS THE START OF THE TRACE, THAT IS, THE DELAY TIME IS SHORTENED.)
- c** ENSURE THAT THE MARKER PULSE OCCURS AT EXACTLY 30 μ S, WITH THE CIRCUMFERENTIAL ADJUSTMENT SCREWS BACKED OFF.
NOTE: THIS TIMING MAY CHANGE AS THE ADJUSTING SCREWS ARE BACKED OFF.
- d** OPEN Y LOGIC GATE, TO LOCATE THE SCREWDRIVER ON TO THE HEAD OF THE CLAMP SCREWS.
- e** LOOSEN THE CLAMP SCREW ONE HALF TURN AND RETIGHTEN.
NOTE: IF THE CLAMP SCREW IS REMOVED OR REPLACED, LIGHTLY LUBRICATE THE SCREW SHANK WITH IBM NO.6 OIL.
- f** CHECK THAT THE MARKER PULSE STILL OCCURS WITHIN 25 TO 35 μ S. IF IT DOES NOT, REPEAT THE ADJUSTMENT FROM STEP C.
- g** BACK OFF THE CIRCUMFERENTIAL ADJUSTMENT SCREWS AND LOCK IN POSITION.
NOTE: THE HORIZONTAL GAP BETWEEN THE POLE PIECE AND THE HUB TOOL TIP MAY NOW MEASURE 0.007 IN \pm 0.005 (0,18 MM \pm 0,13) DUE TO PIVOTING OF THE TRANSDUCER BOOM (SEE 3.5.2.1. STEP 6)
- h** CLOSE Y GATE.

- 7a** THE OSCILLOSCOPE DISPLAY SHOULD RESEMBLE THAT SHOWN; THE MARKER PULSE, WHICH PRECEDES A TRAIN OF PULSES BY 10 μ S, SHOULD OCCUR 30 μ S \pm 5 FROM THE START OF THE TRACE.
- b** OPEN 'Y' LOGIC GATE.
- c** TO ADJUST THE MARKER PULSE, LOOSEN THE THREE SECURING SCREWS, TURN THE ECCENTRIC ADJUSTER UNTIL THE MARKER PULSE OCCURS AT EXACTLY 30 μ S.
- d** LOCK THE THREE SECURING SCREWS.
- e** CHECK THAT THE MARKER PULSE STILL OCCURS WITHIN 25 TO 35 μ S. IF IT DOES NOT, REPEAT STEP 7.
NOTE: THE HORIZONTAL GAP BETWEEN THE POLE PIECE AND THE HUB TOOL TIP MAY NOW MEASURE 0.007 IN \pm 0.005 (0,18 MM \pm 0,13) DUE TO PIVOTING OF THE TRANSDUCER BOOM (SEE 3.5.2.1. STEP 6).
- f** CLOSE 'Y' GATE.



OSCILLOSCOPE DISPLAY

SHT 2 OF 2 SHTS

19711115 C

IBM MATERIAL NO	0 1 2 0 25.4 50.8	MUST CONFORM TO ENG SPEC 890350		IBM	
IBM MATL ALTERNATE NO	SCALE	TOLERANCES UNLESS OTHERWISE NOTED	INCH	mm	NAME TDSR ADJ FOR FETMM.
CASE DEPTH		LINEAR \pm			DESIGNER
HARDNESS	THIRD ANGLE PROJECTION	ANGLES \pm			DETAILER
SURFACE TREATMENT		RADII UNLESS OTHERWISE NOTED			DWG CHK
		EDGE/CORNER BREAKS	OUTSIDE MAX		DSGN APPRO
			INSIDE MAX		CLASSIFICATION

TABLE OF CONTENTS VOL#002 FOR 54442 A00

MODE RQST BY LOGIC LL DATE 14DEC72

PAGE NO. SH	TITLE	PART NO	EC NO.	FEATURE B/M OR B/MS
** LOGIC TYPE	SYSTEM DIAGRAMS			0
AMAP CHART	MAP INDEX	2600597	392681	
PMAP CHART	MAP 5444 MAIN ENTRY	2600546	392697	
CMAP CHART 1	MAP NOT READY	2600547	392697	
CMAP-CHART 1	MAP NOT READY	2600594	392697	
DMAP CHART	MAP DATA UNSAFE	2600548	392667	
EMAP CHART	MAP READ FAILURE	2600549	392697	
FMAP CHART	MAP CARTRIDGE UNSAFE	2600550	392667	
GMAP CHART 1	MAP SEEK FAILURE	2600551	392667	
GMAP-CHART 1	MAP SEEK FAILURE	2600595	392697	
HMAP CHART	MAP CE SWITCH FAILURE	2600552	392652	
IMAP CHART	MAP MISSING INTERFACE SIGNAL	2600553	392697	
JMAP CHART	MAP SERVICE CHECKS	2600596	392681	

5444 DISK FILE MAP CHARTS

INDEX

PAGE 990

01/12/72

PREV EC 392697

PRES EC 392681

PN 2600597

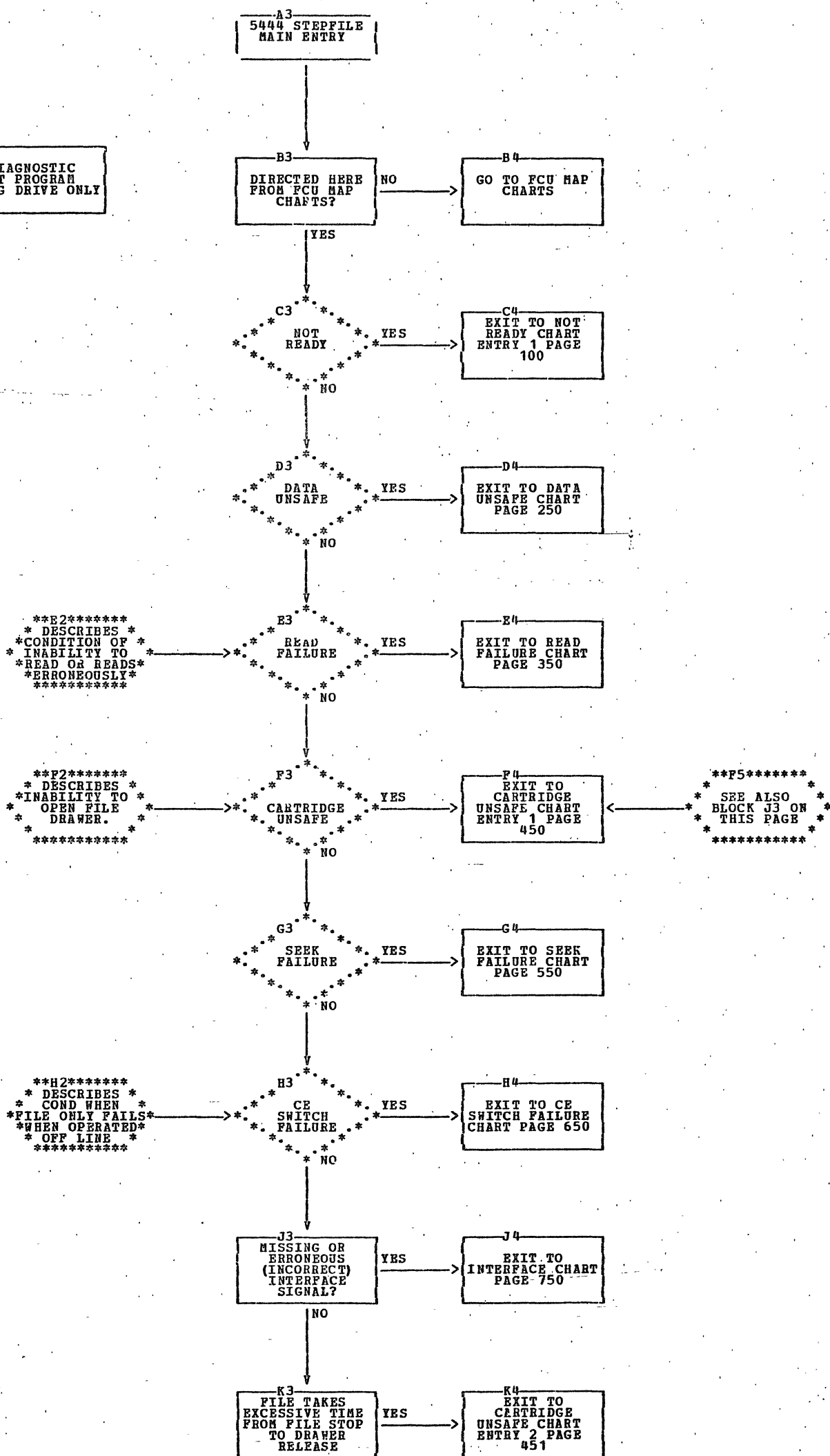
SHEET 01 OF 01

CHART NAME	PART NUMBER	PRES EC
5444 MAIN ENTRY	2600546	392697
NOT READY STANDARD SPEED FILES (MODELS 1, 2 AND 3)	2600547	392697
NOT READY HIGH SPEED FILES (MODELS A01, A02 AND A03)	2600594	392697
DATA UNSAFE	2600543	392667
READ FAILURE	2600549	392697
CARTRIDGE UNSAFE	2600550	392667
SEEK FAILURE STANDARD SPEED FILES (MODELS 1, 2 AND 3)	2600551	392697
SEEK FAILURE HIGH SPEED FILES (MODELS A01, A02 AND A03)	2600595	392697
CE SWITCH FAILURE	2600552	392652
MISSING INTERFACE SIGNAL	2600553	392697
SERVICE CHECKS	2600596	392681

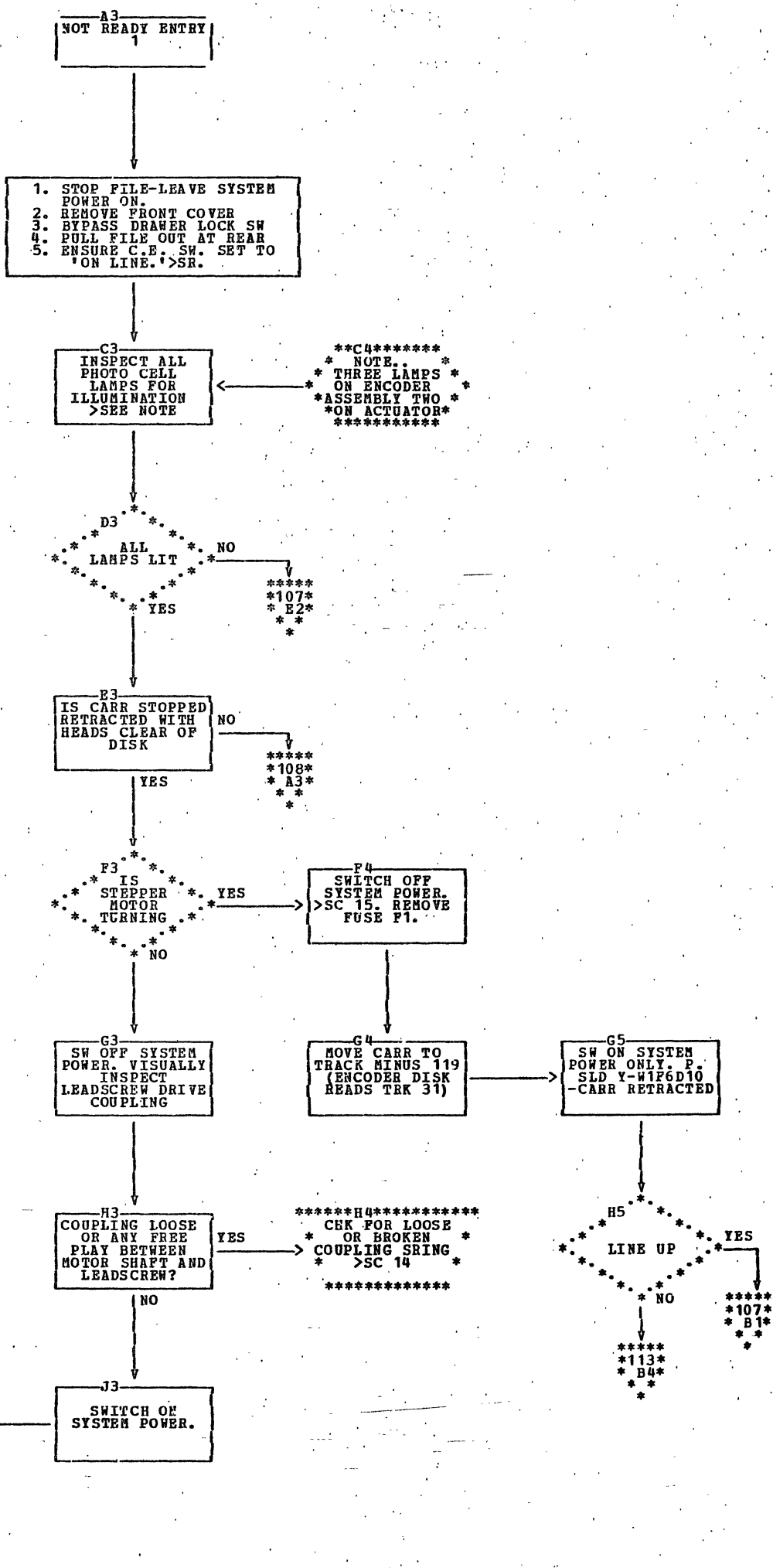
5444 STEPPFILE MAIN ENTRY CHART

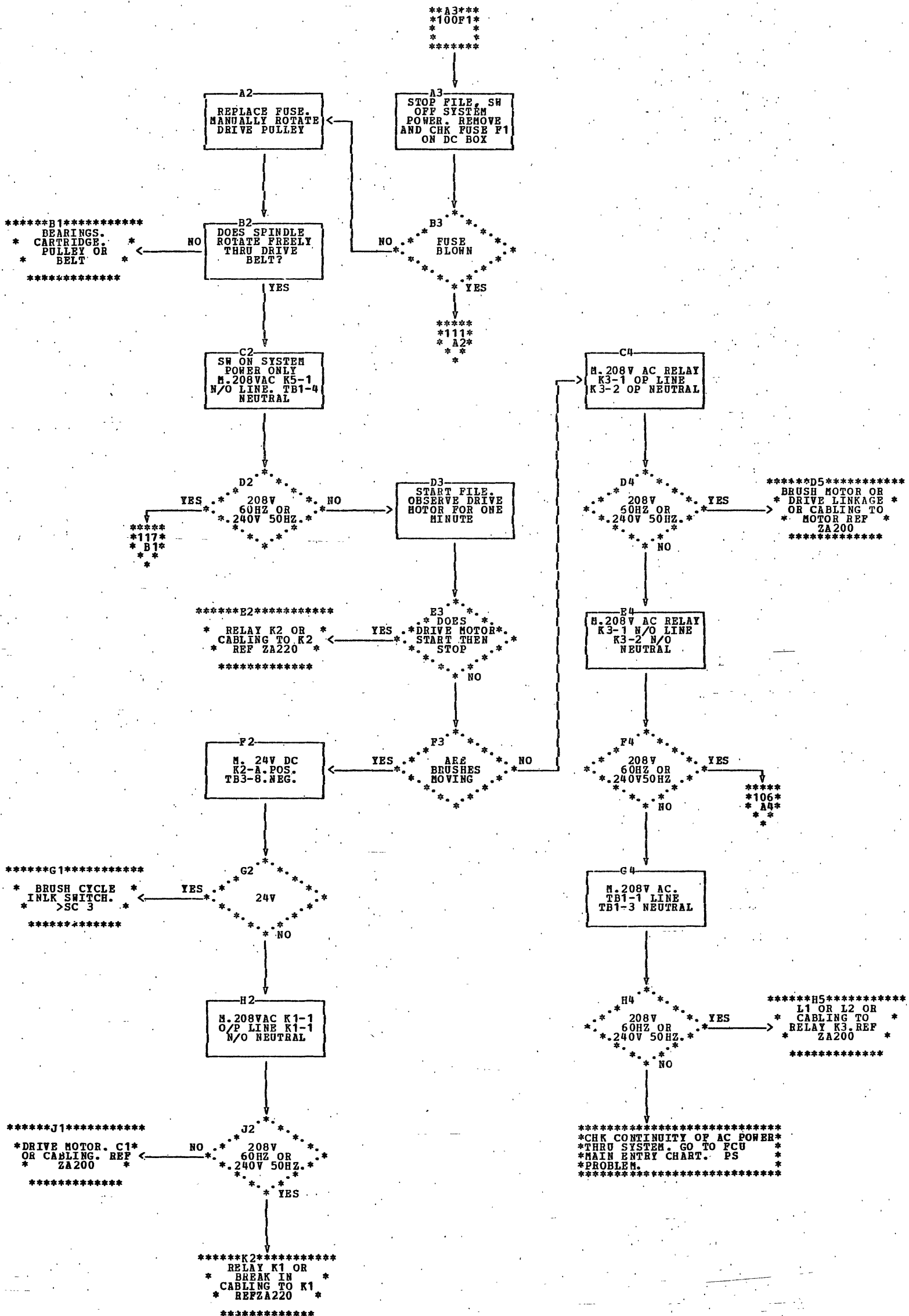
PREV EC 392644 PRES EC 392697 PN 2600546 SHEET 1 OF 1

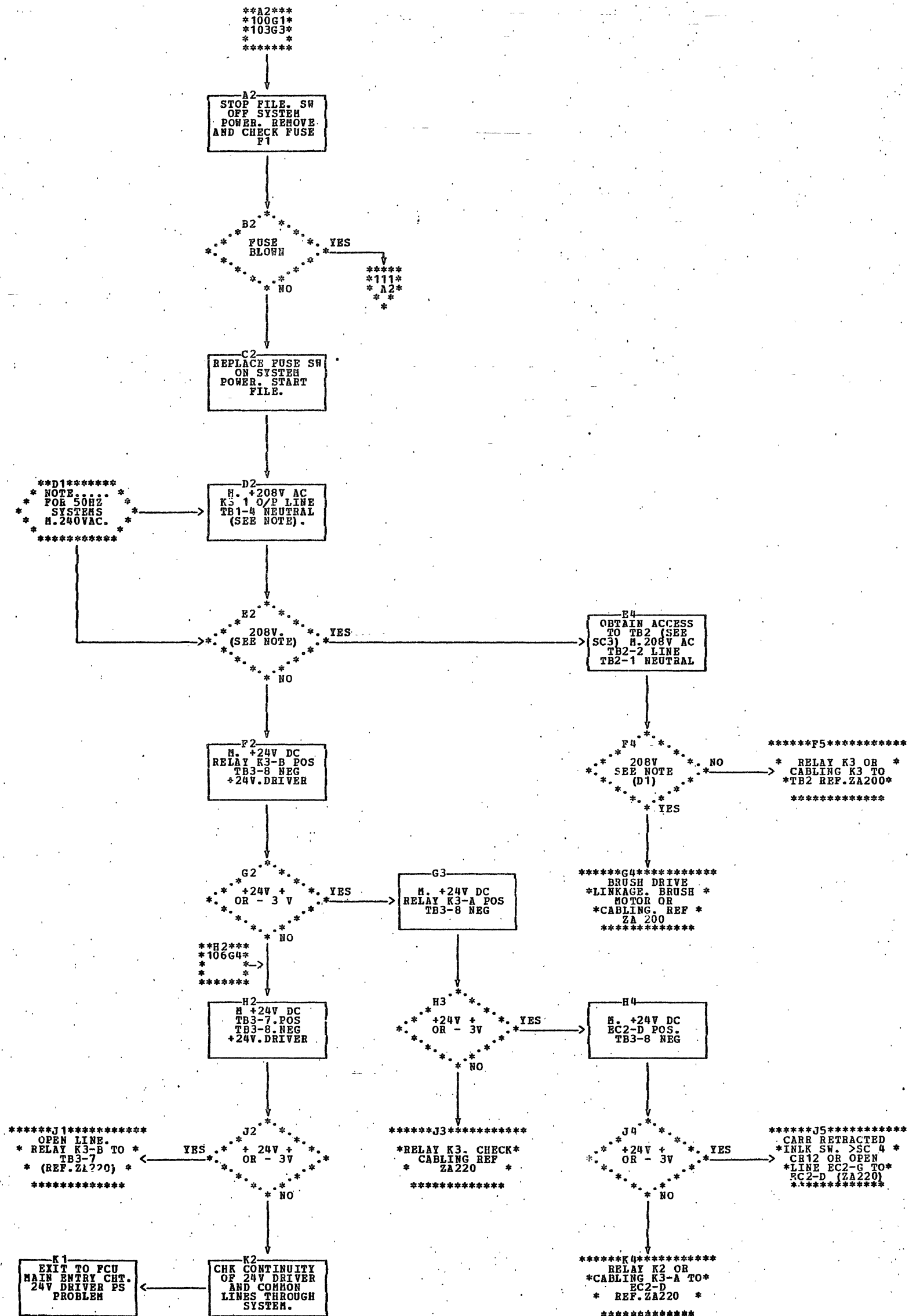
NOTE- WHEN LOOPING ON A DIAGNOSTIC PROGRAM IT IS REQUIRED THAT PROGRAM SHOULD BE LOOPED ON FAILING DRIVE ONLY

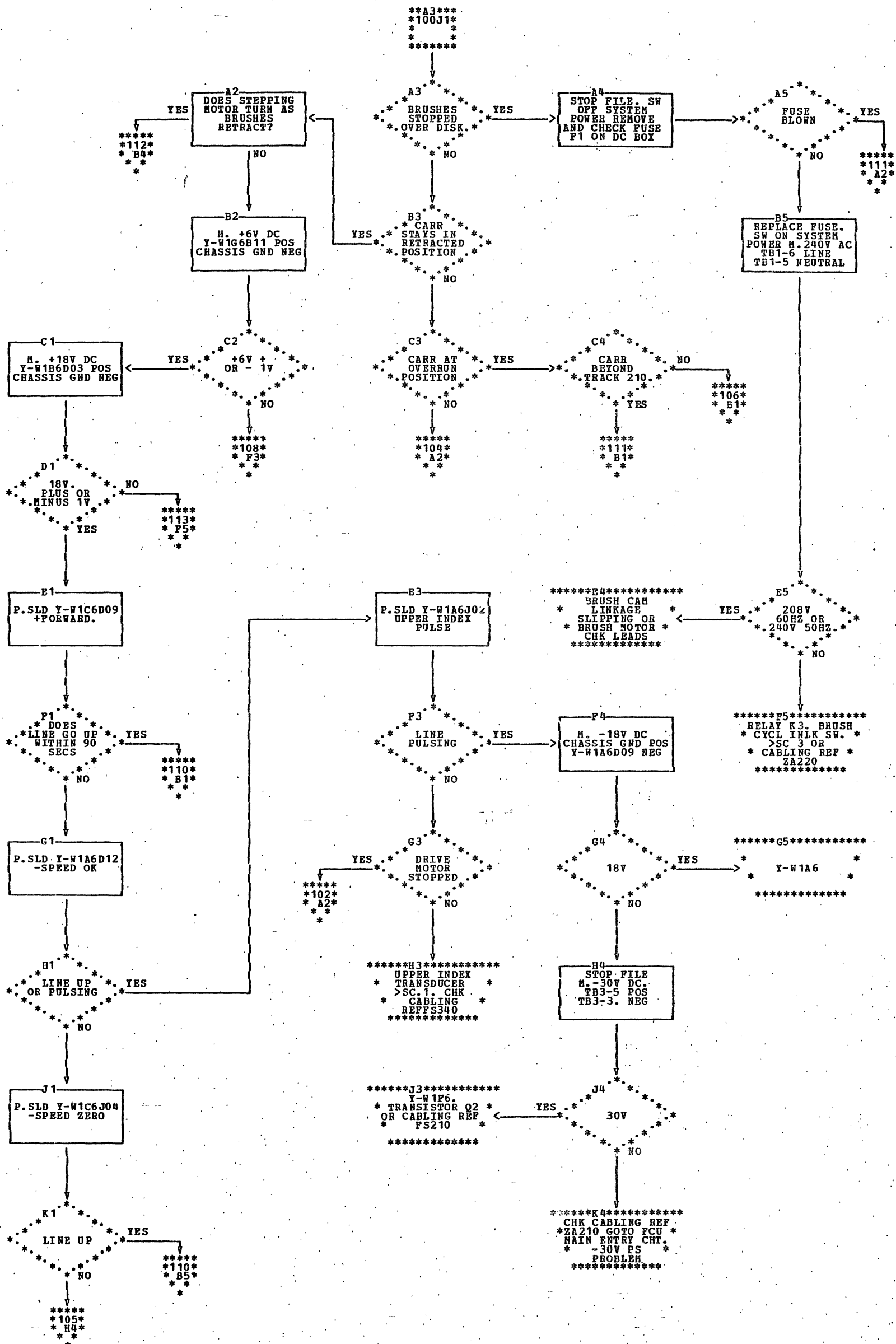


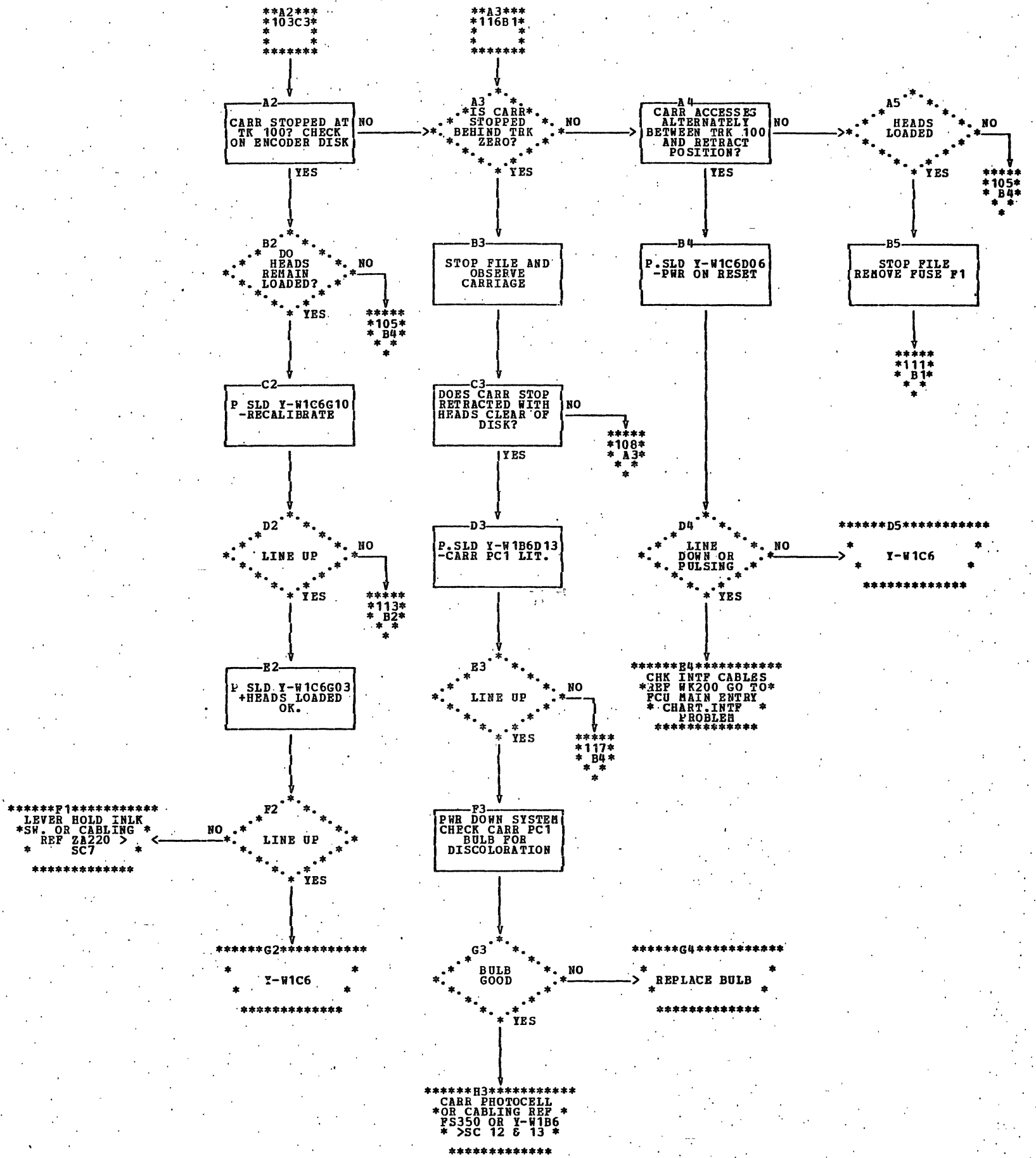
* CAUTION. *
* DO NOT ATTEMPT TO REMOVE *
* CARTRIDGE BEFORE CHECKING *
* HEADS AND BRUSHES ARE *
* CLEAR OF DISK *

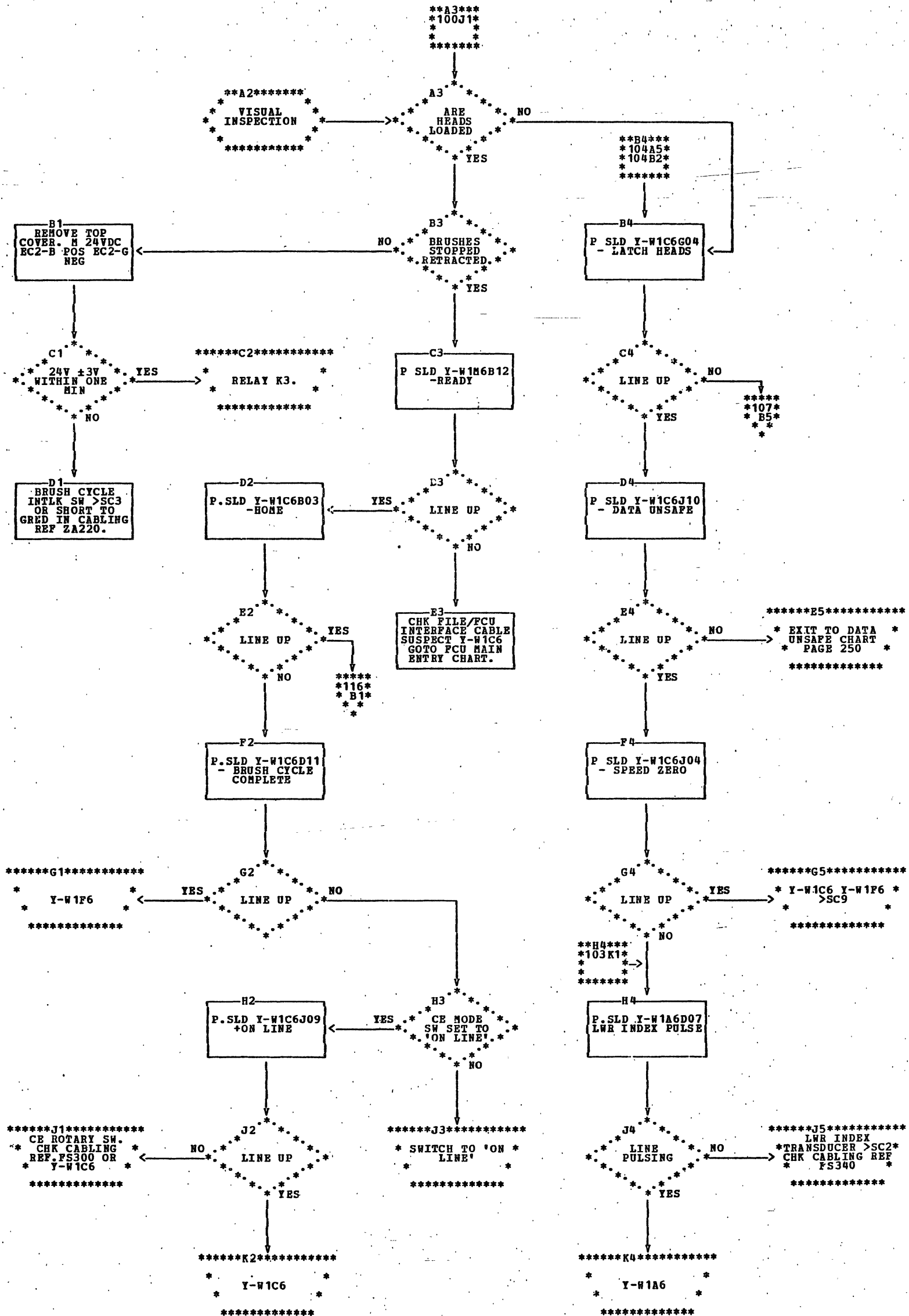


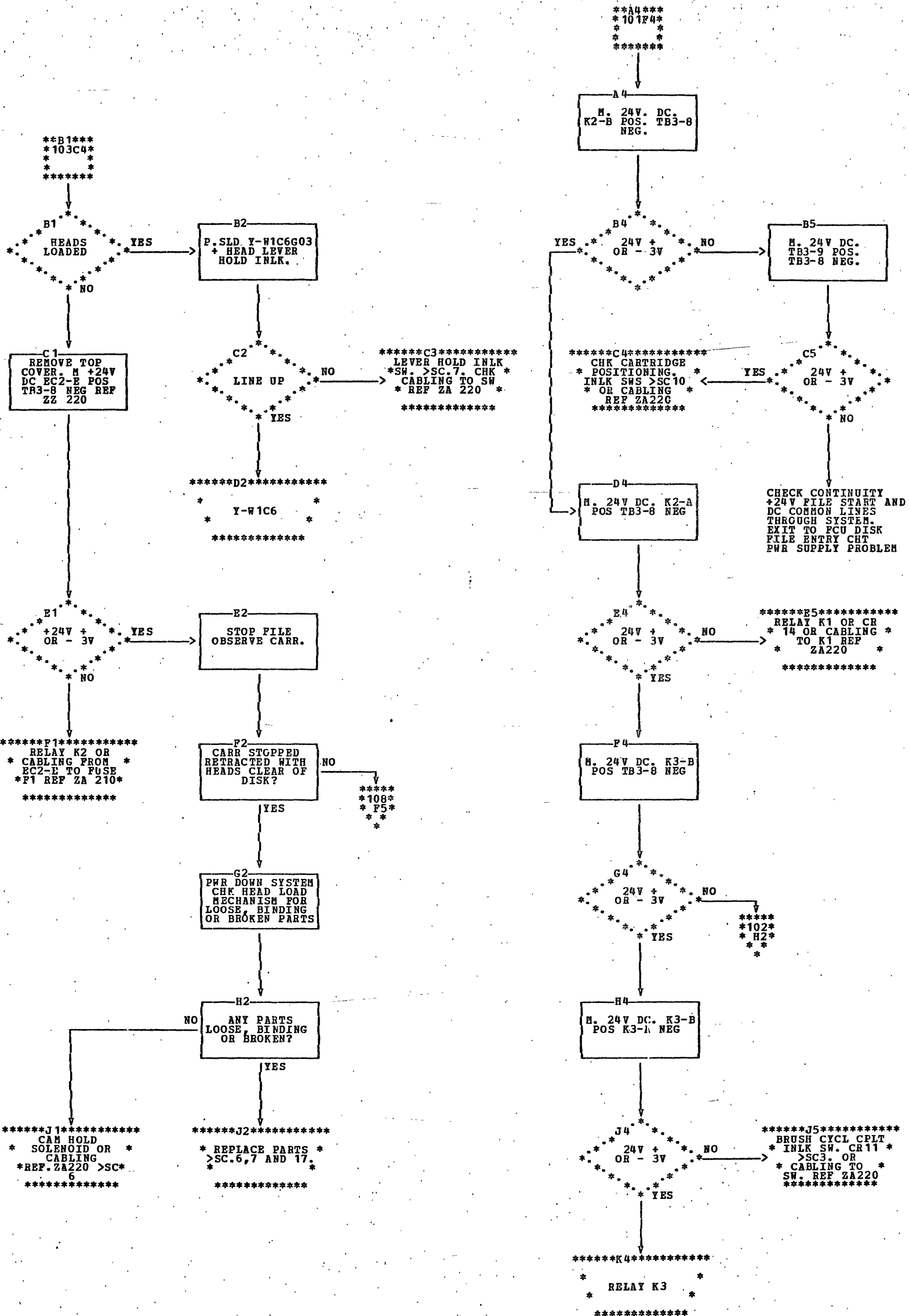


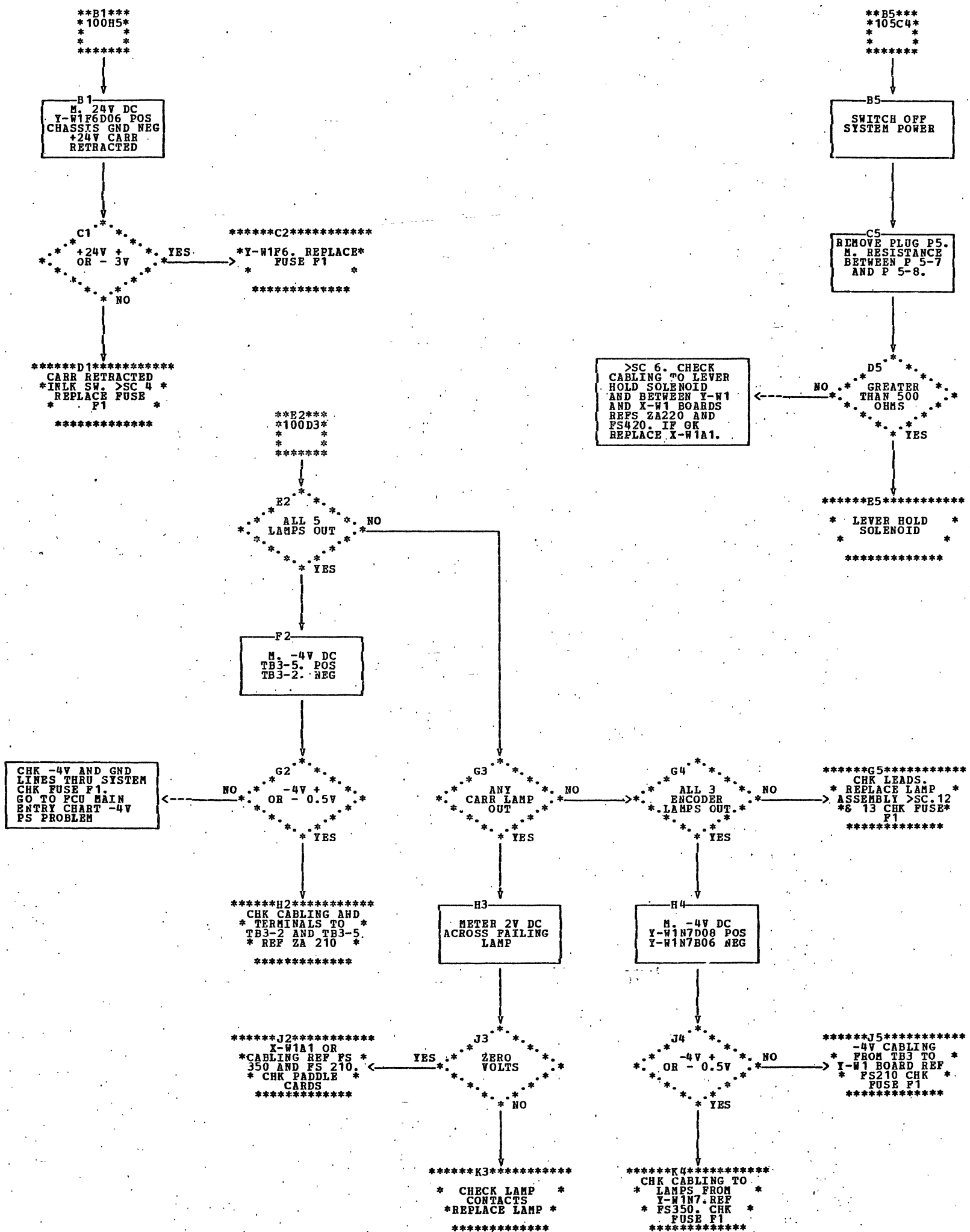


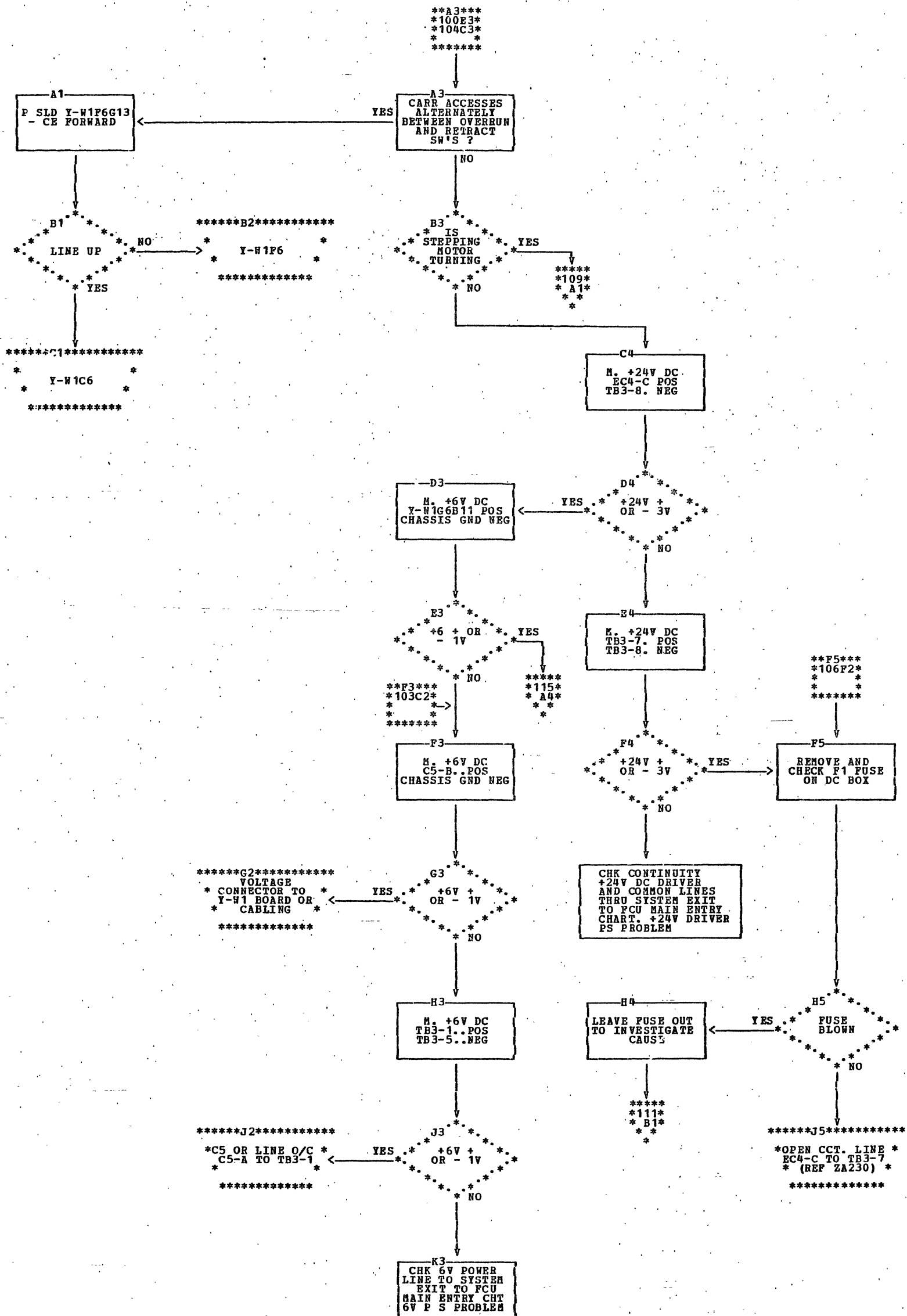


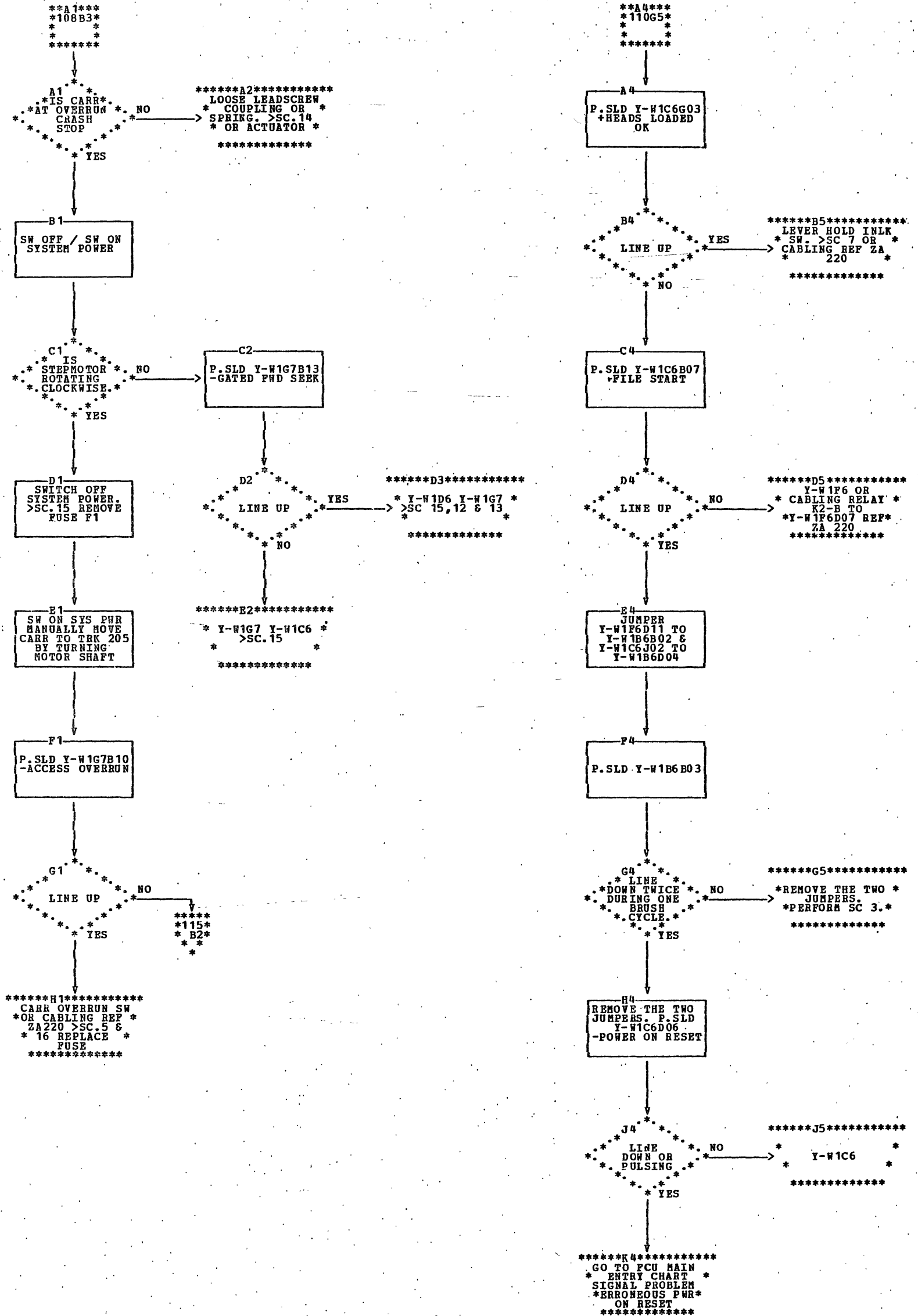


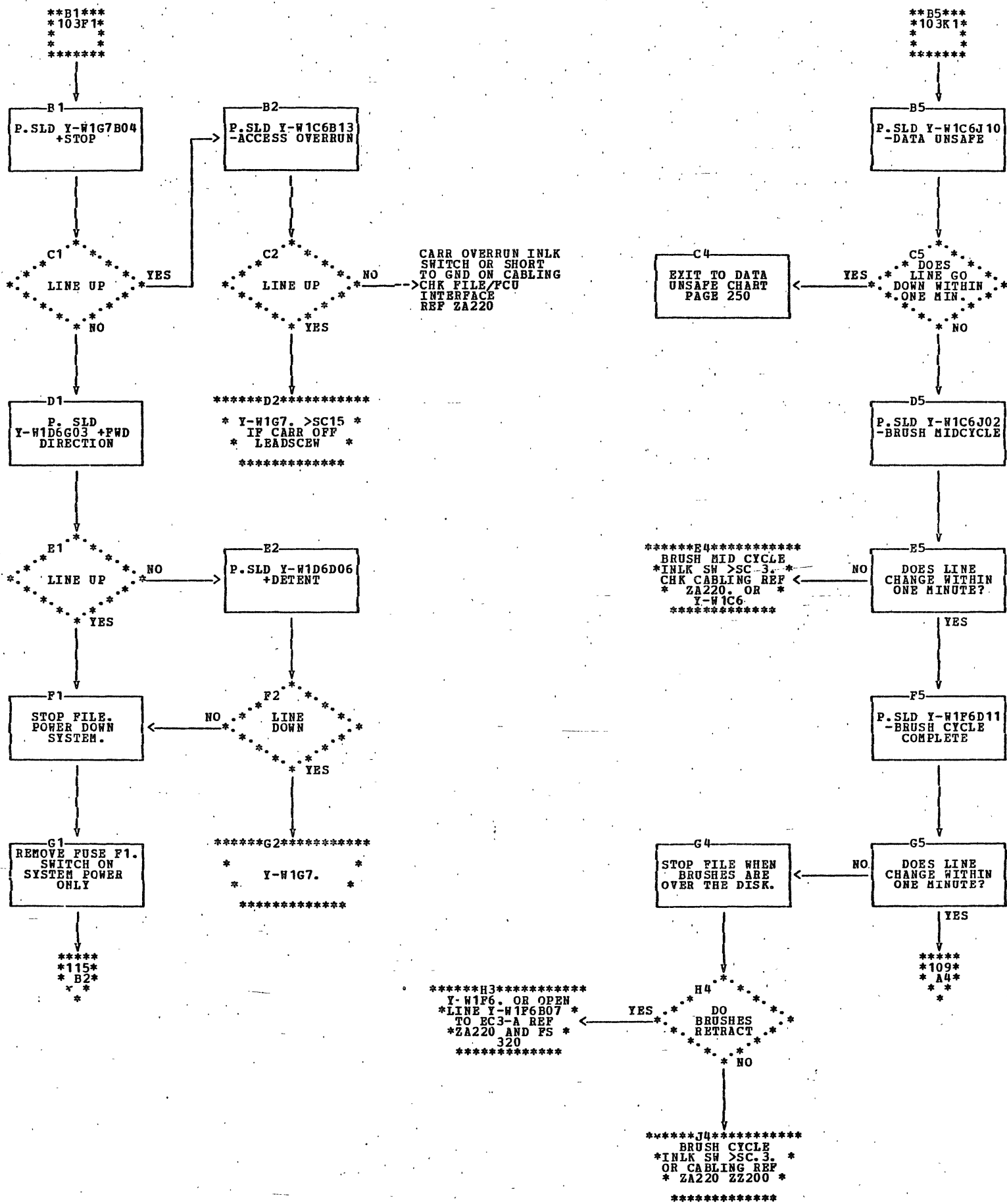


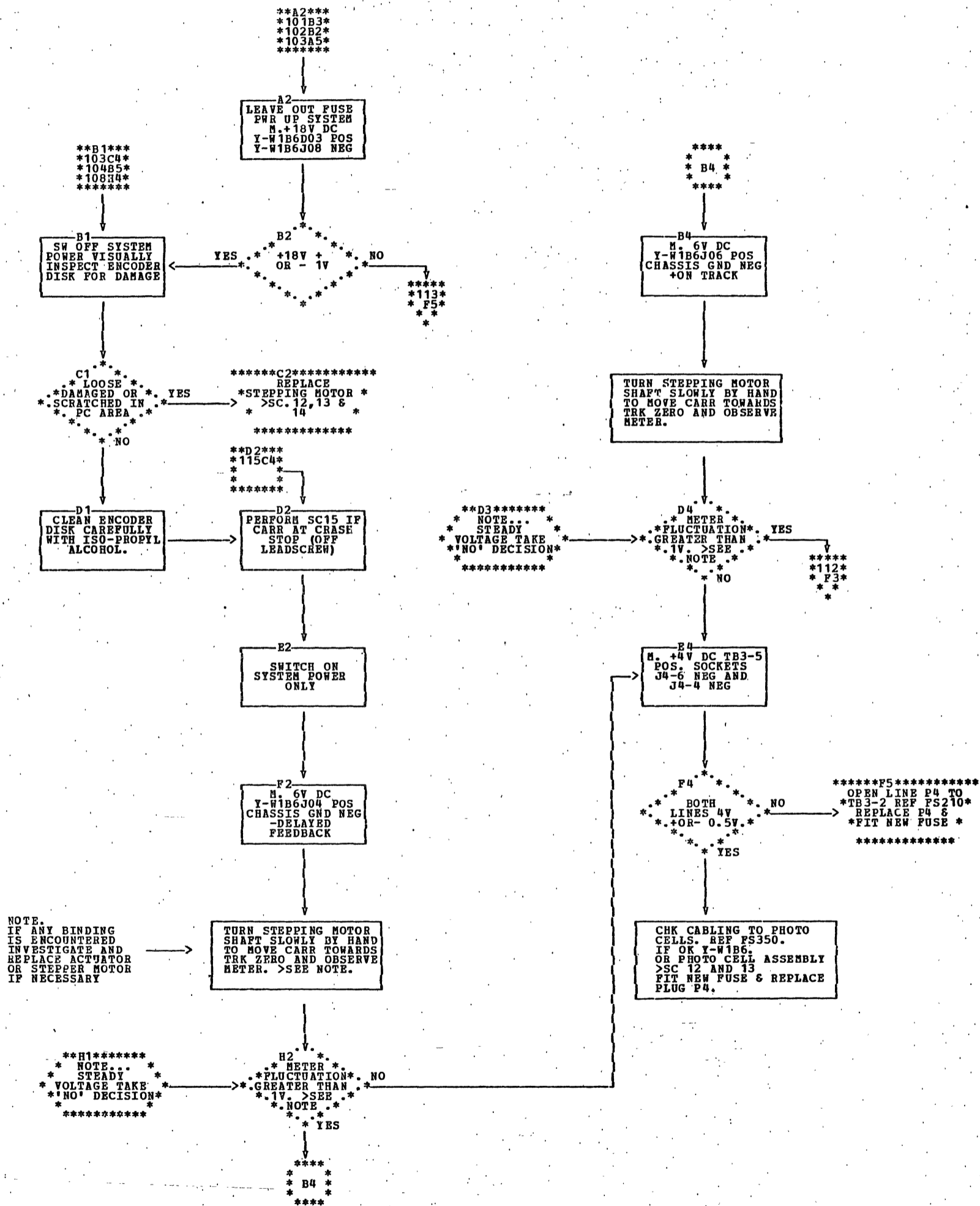


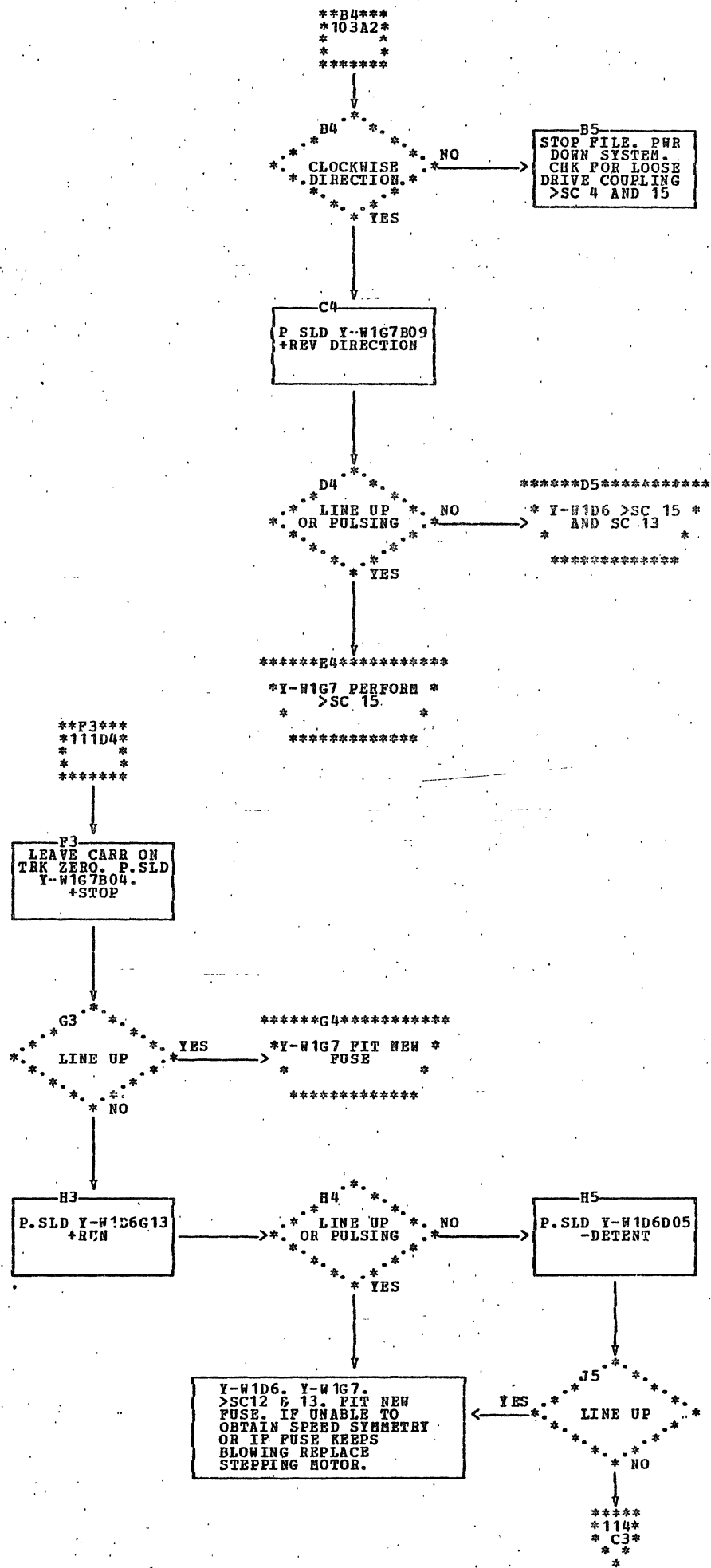


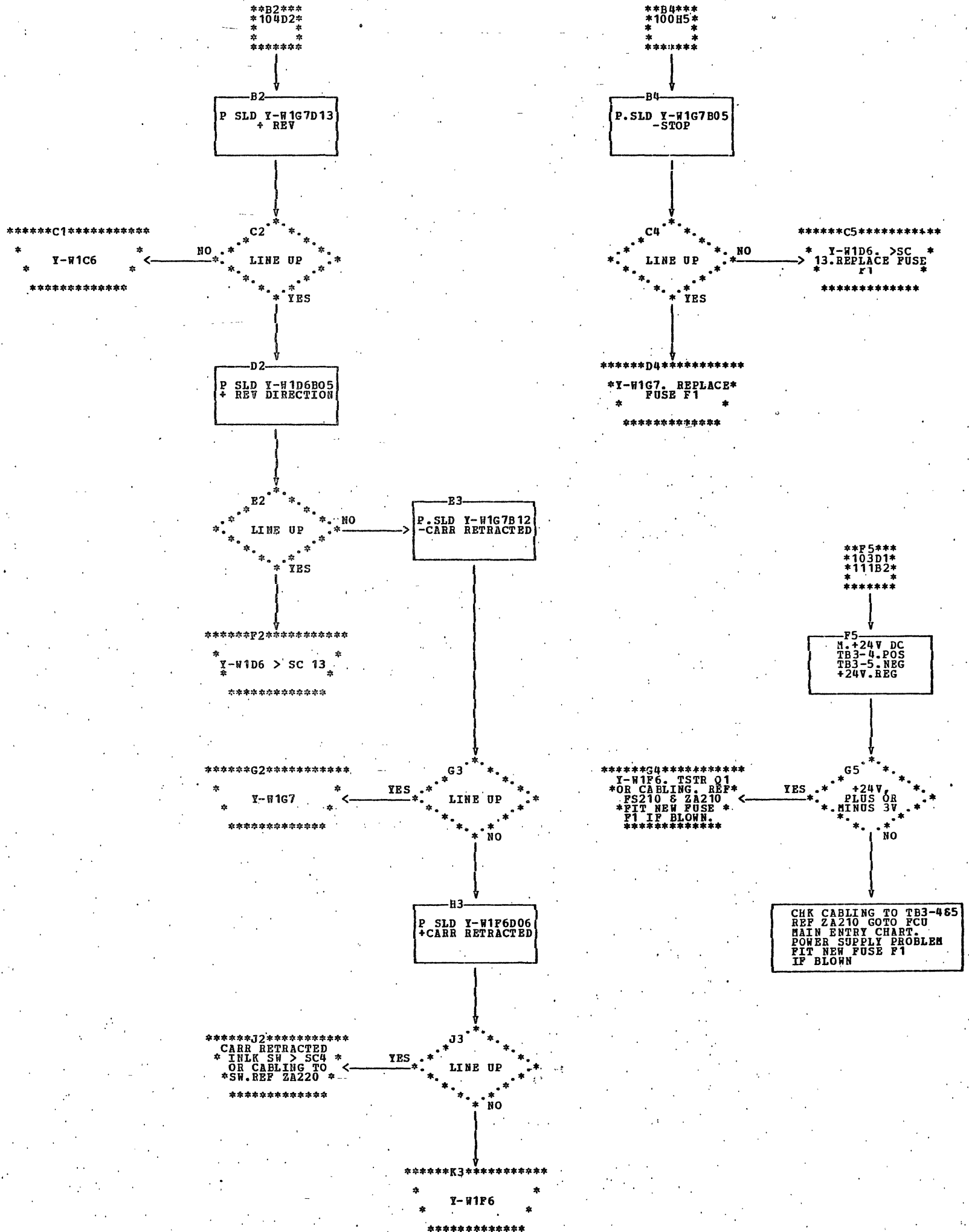


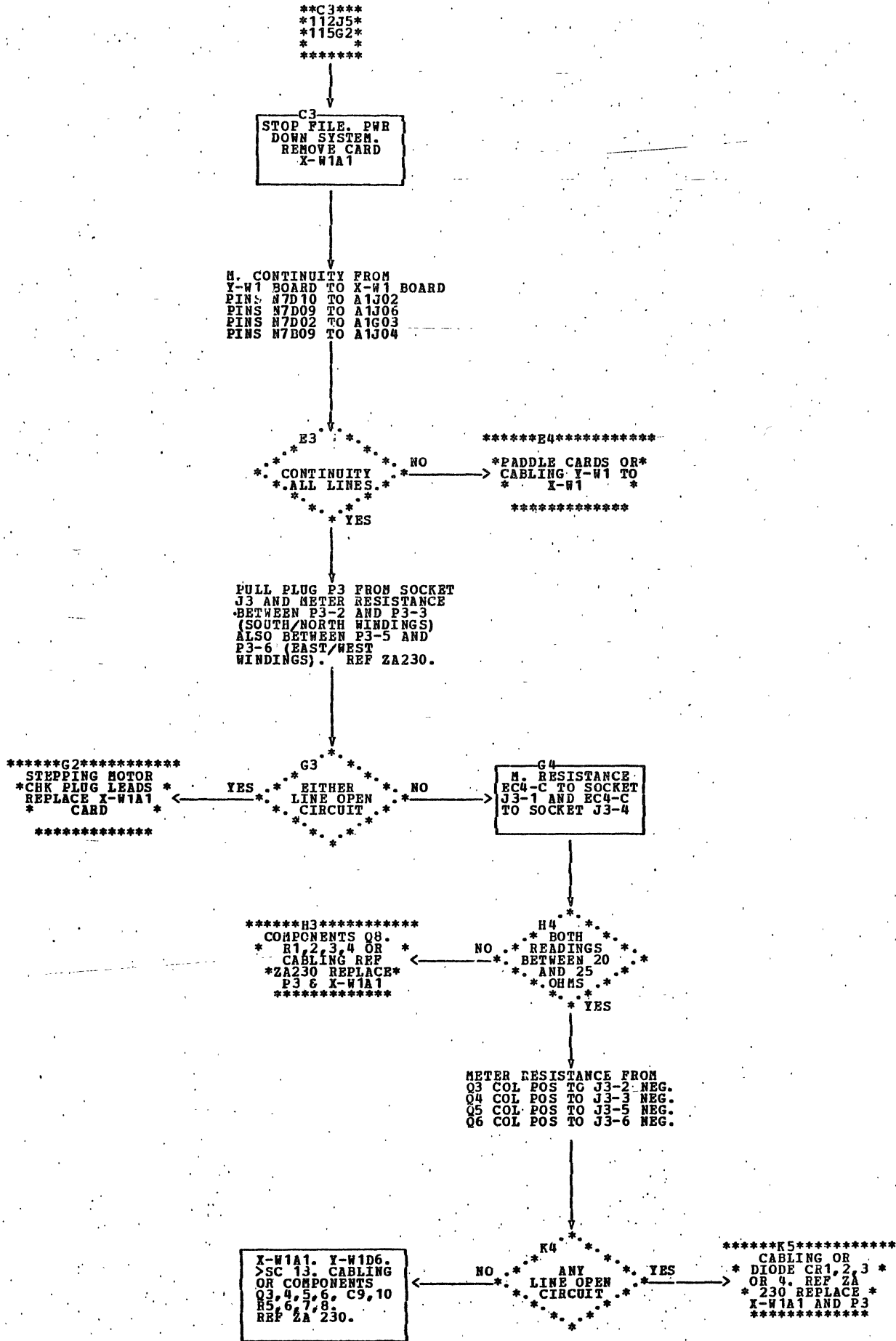


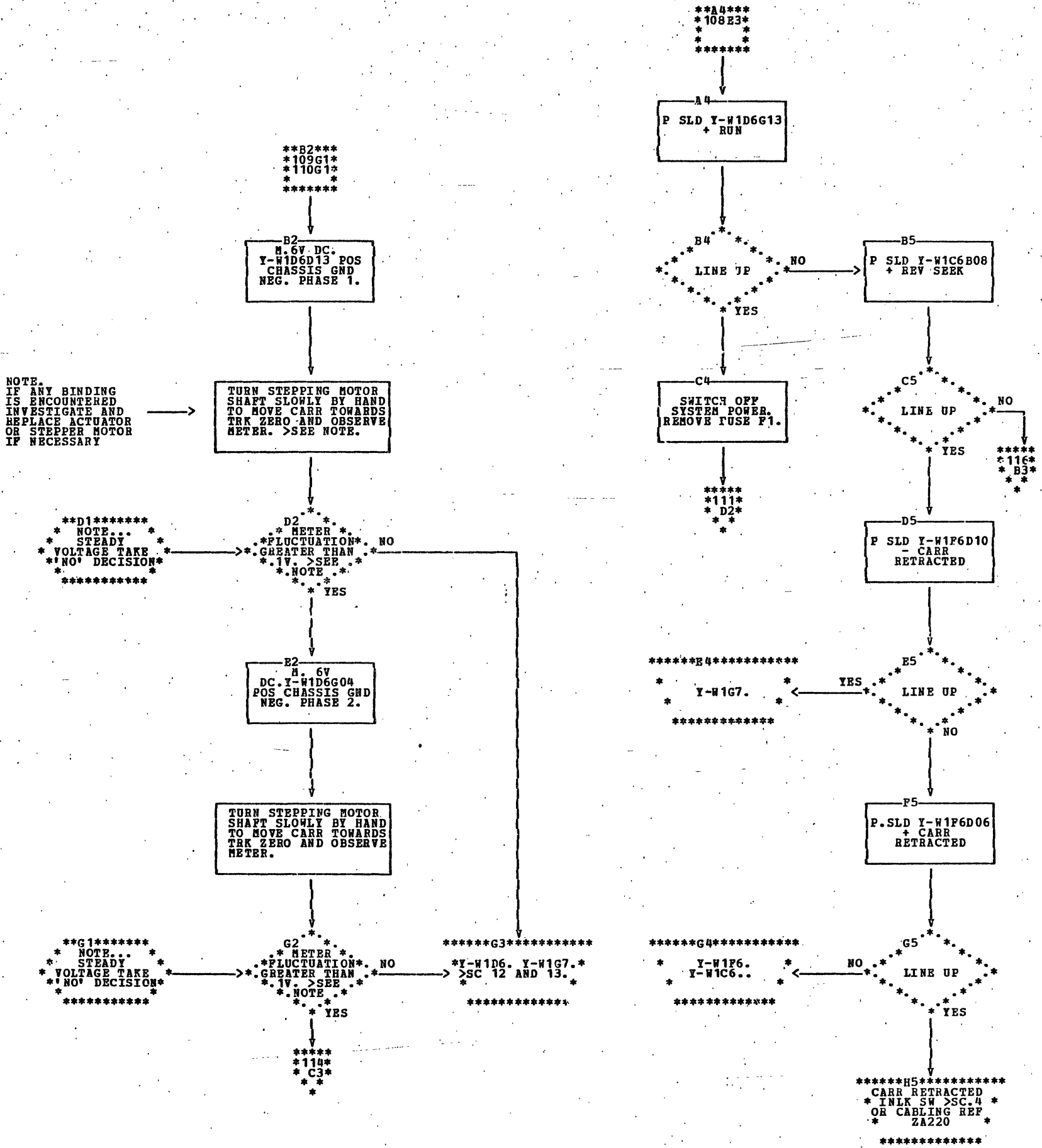


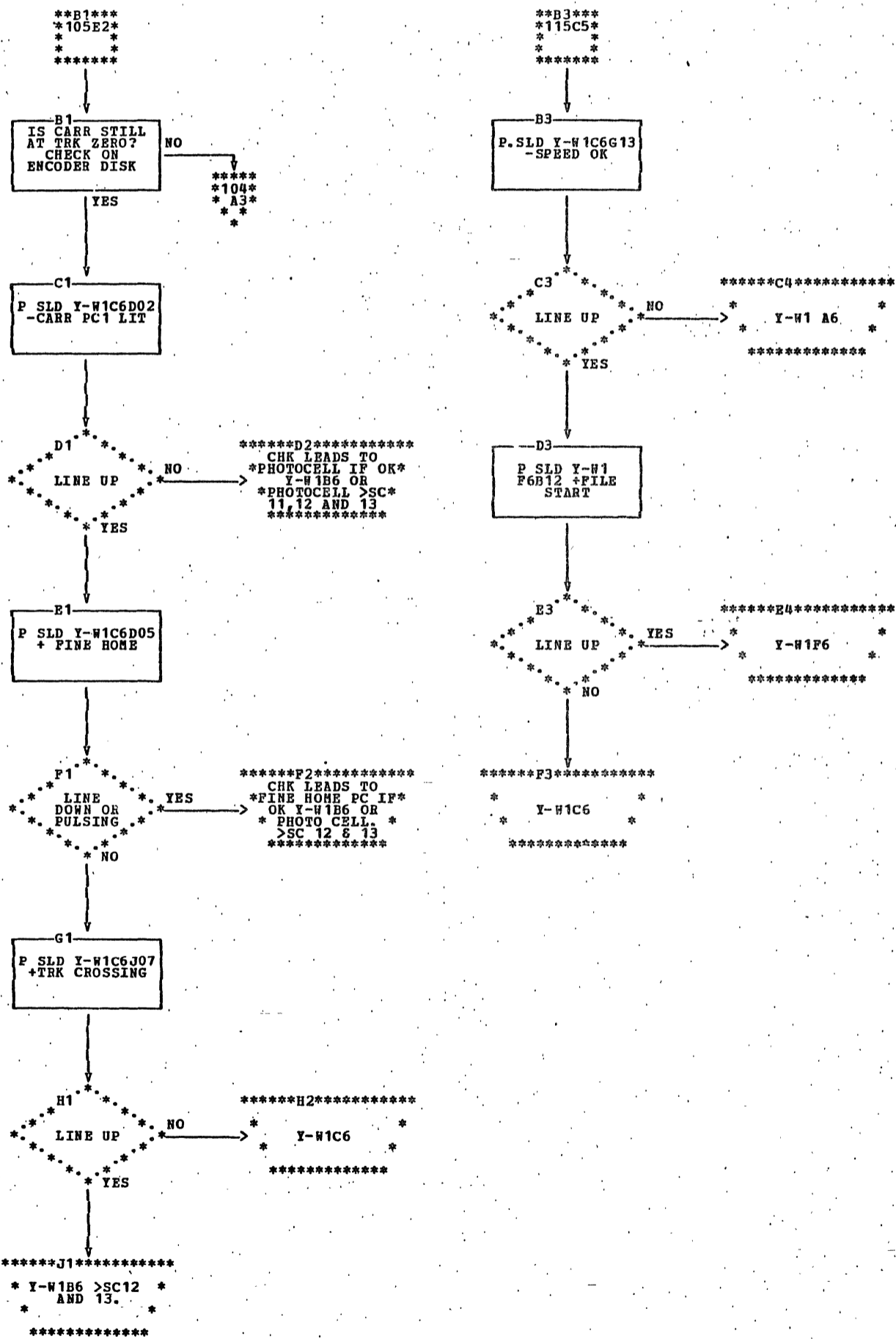


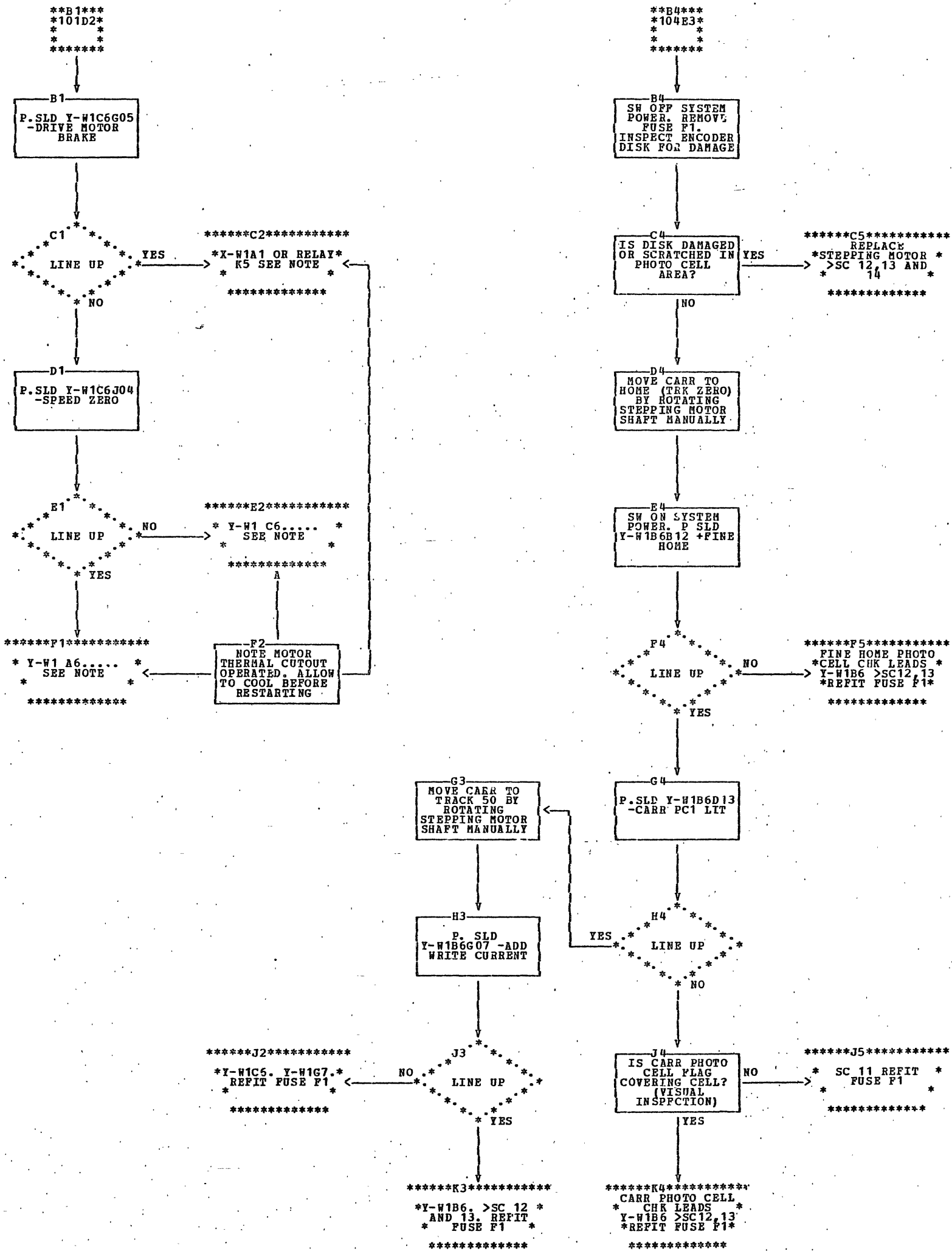




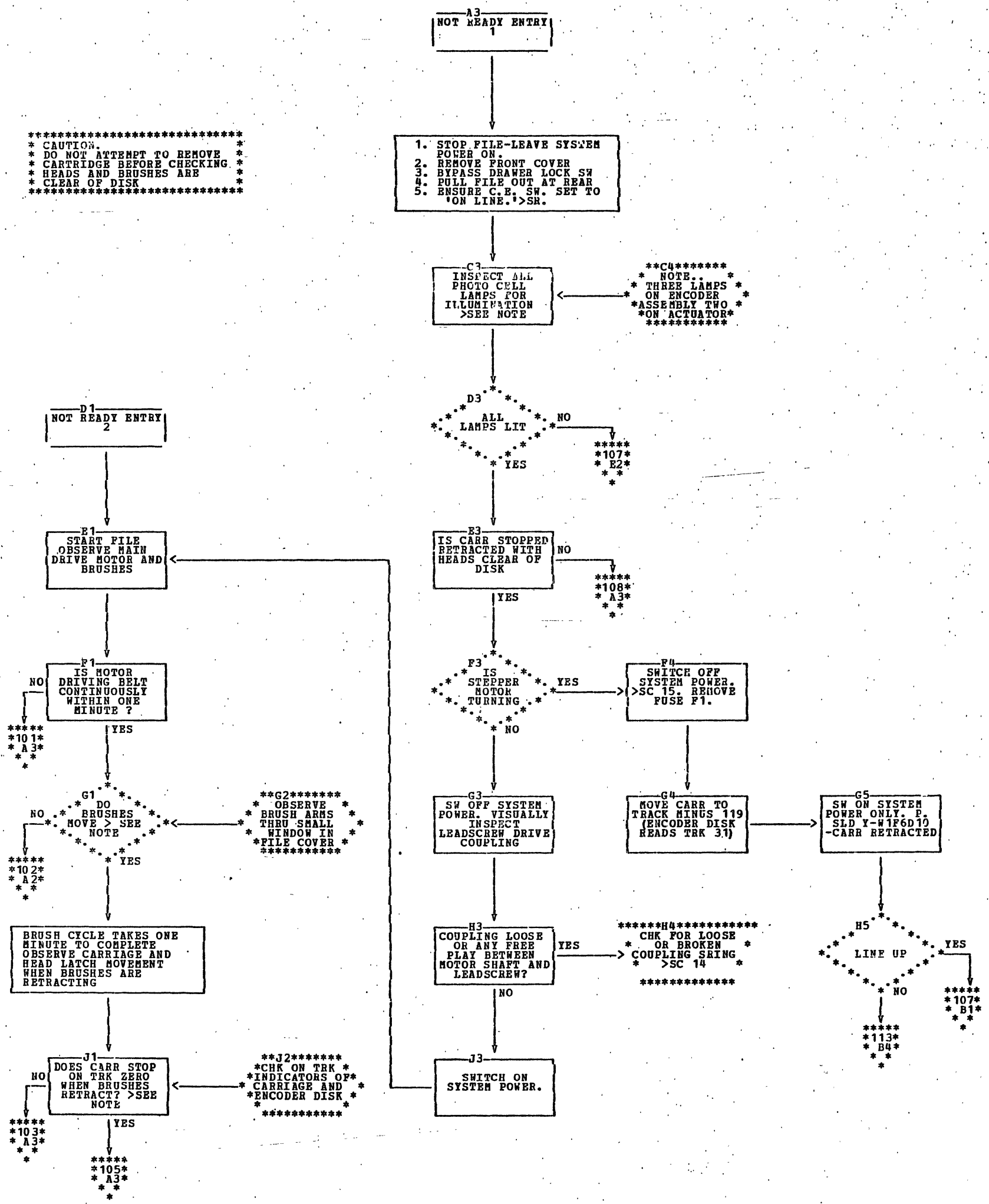


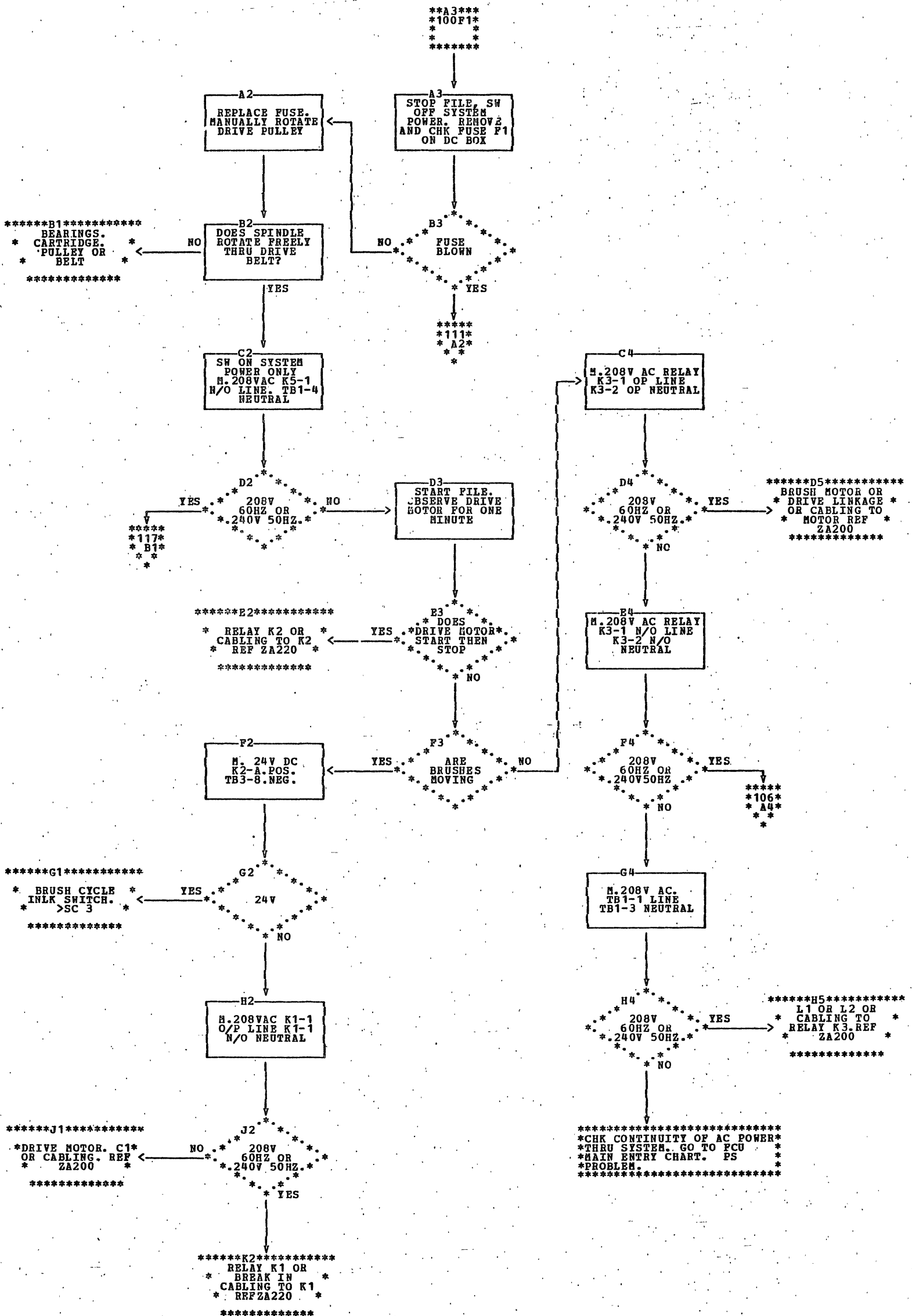






 * CAUTION *
 * DO NOT ATTEMPT TO REMOVE *
 * CARTRIDGE BEFORE CHECKING *
 * HEADS AND BRUSHES ARE *
 * CLEAR OF DISK *





A2*
100G1
103G3
*

A2
STOP FILE. SW
OFF SYSTEM
POWER. REMOVE
AND CHECK FUSE
F1

B2
* * * * *
* FUSE
* BLOWN *
* * * * *
YES
NO

111
A2
*

C2
REPLACE FUSE SW
ON SYSTEM
POWER. START
FILE.

D1***
* NOTE *
* FOR 50HZ *
* SYSTEMS *
* N. 240VAC. *
* * * * *

D2
M. +208V AC
K3-1 O/P LINE
TB1-4 NEUTRAL
(SEE NOTE).

E2
* * * * *
* 208V *
* (SEE NOTE) *
* * * * *
YES
NO

E4
OBTAIN ACCESS
TO TB2 (SEE
SC3) N. 208V AC
TB2-2 LINE
TB2-1 NEUTRAL

F2
M. +24V DC
RELAY K3-B POS
TB3-8 NEG
+24V. DRIVER

F4
* * * * *
* 208V *
* SEE NOTE *
* (D1) *
* * * * *
NO
YES

*****F5*****
* RELAY K3 OR *
* CABLING K3 TO *
* TB2 REF. ZA200 *

G2
* * * * *
* +24V + *
* OR - 3V *
* * * * *
YES
NO

G3
M. +24V DC
RELAY K3-A POS
TB3-8 NEG

*****G4*****
* BRUSH DRIVE *
* LINKAGE, BRUSH *
* MOTOR OR *
* CABLING, REF *
* ZA 200 *

H2*
106G4
->
* * * * *

H2
M. +24V DC
TB3-7. POS
TB3-8. NEG
+24V. DRIVER

H3
* * * * *
* +24V + *
* OR - 3V *
* * * * *
YES
NO

H4
M. +24V DC
EC2-D POS.
TB3-8 NEG

J1**
* OPEN LINE. *
* RELAY K3-B TO *
* TB3-7 *
* (REF. ZA220) *
* * * * *

J2
* * * * *
* + 24V + *
* OR - 3V *
* * * * *
YES
NO

*****J3*****
* RELAY K3. CHECK *
* CABLING REF *
* ZA220 *

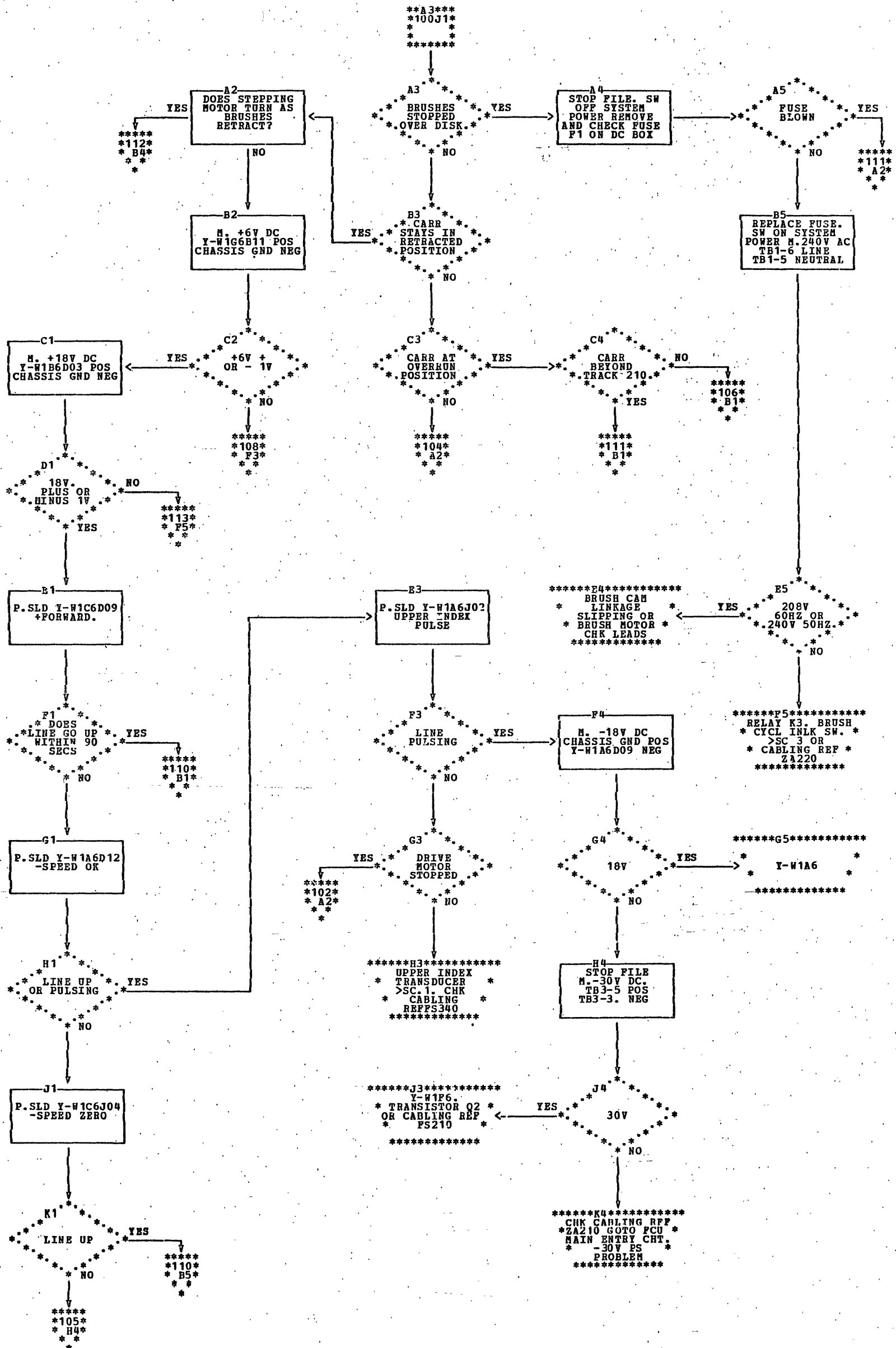
J4
* * * * *
* +24V + *
* OR - 3V *
* * * * *
YES
NO

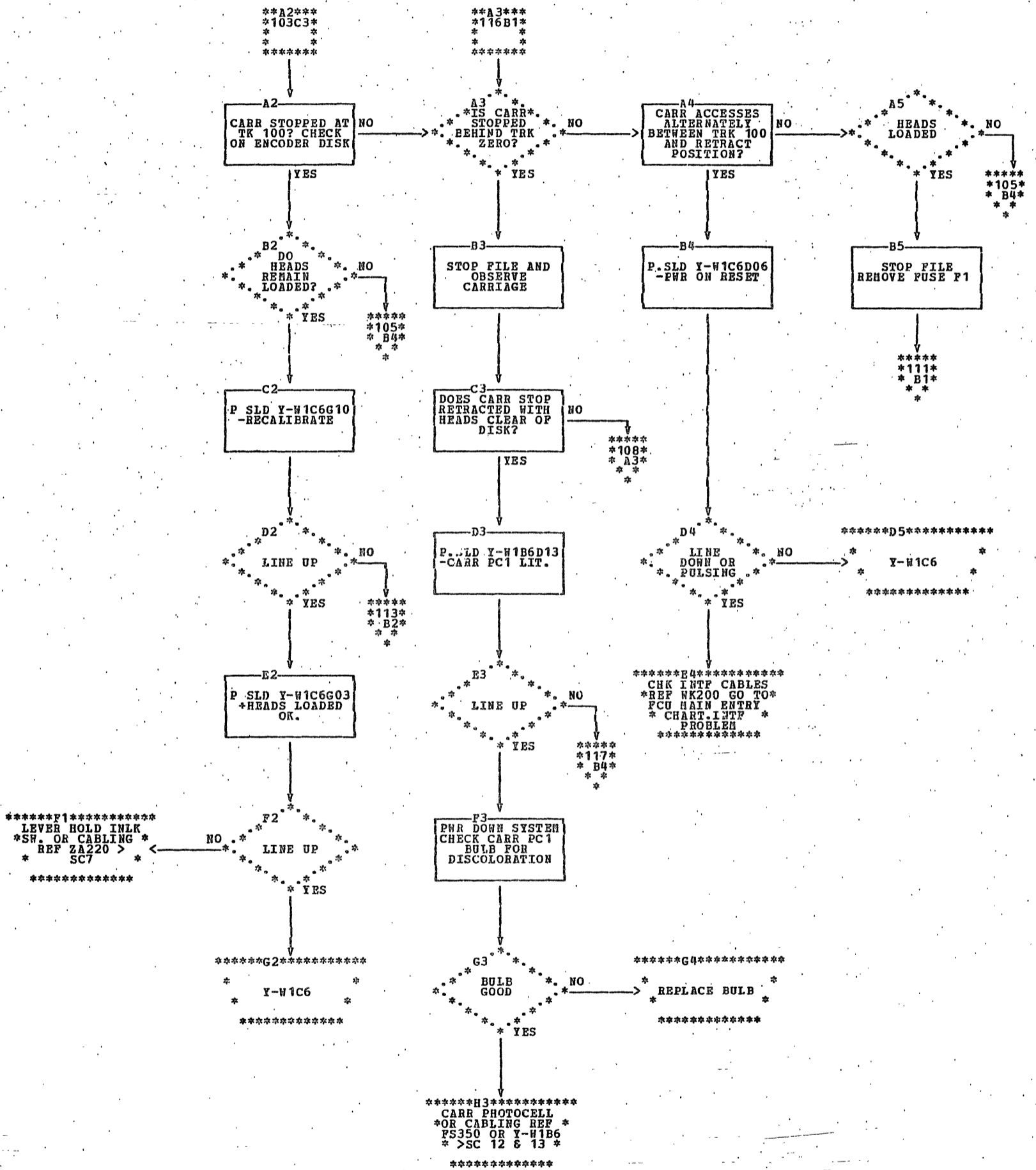
*****J5*****
* CABR RETRACTED *
* INLK SW. >SC 4 *
* CR12 OR OPEN *
* LINE EC2-G TO *
* EC2-D (ZA220) *

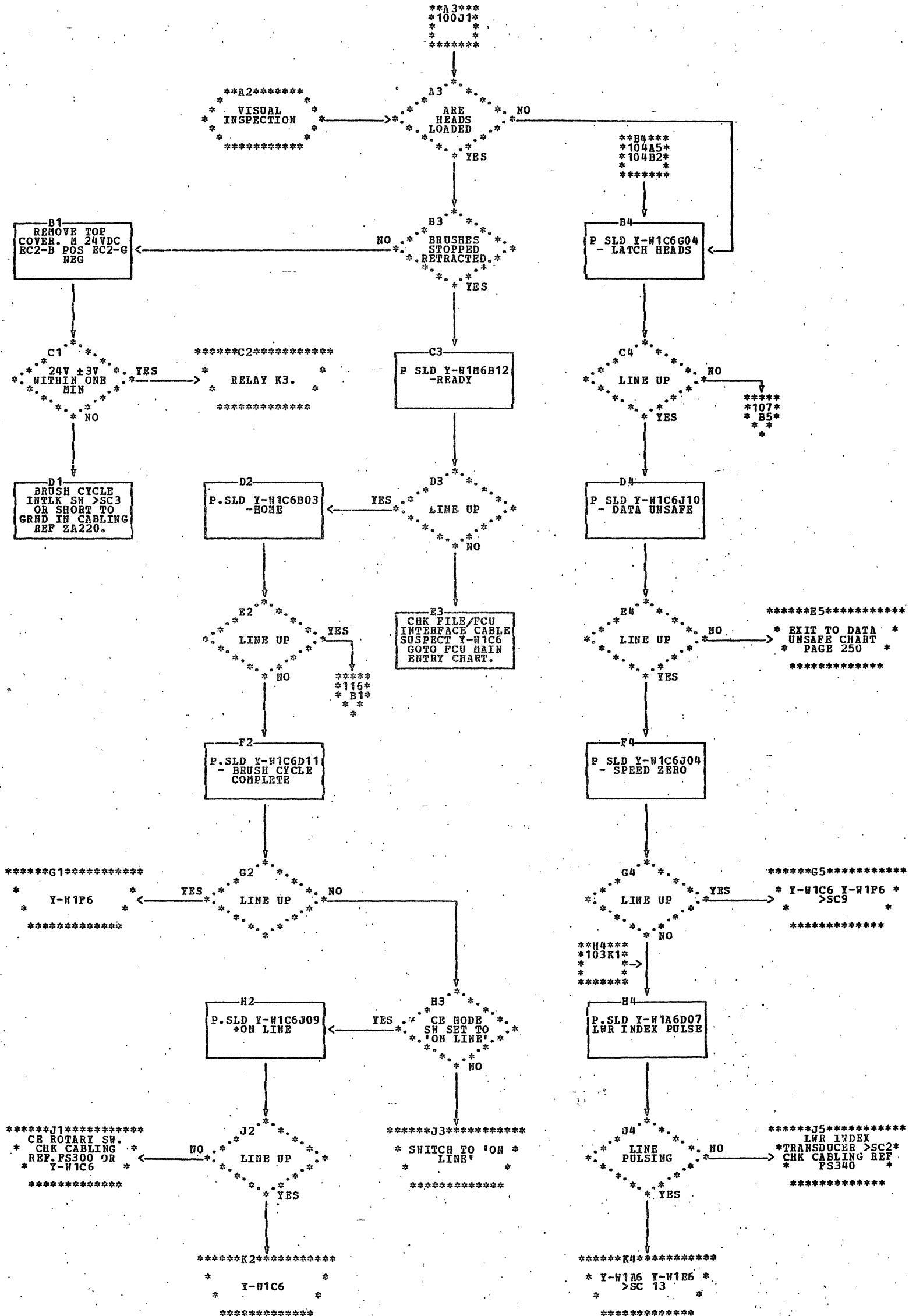
K1
EXIT TO FCU
MAIN ENTRY CHT.
24V DRIVER PS
PROBLEM

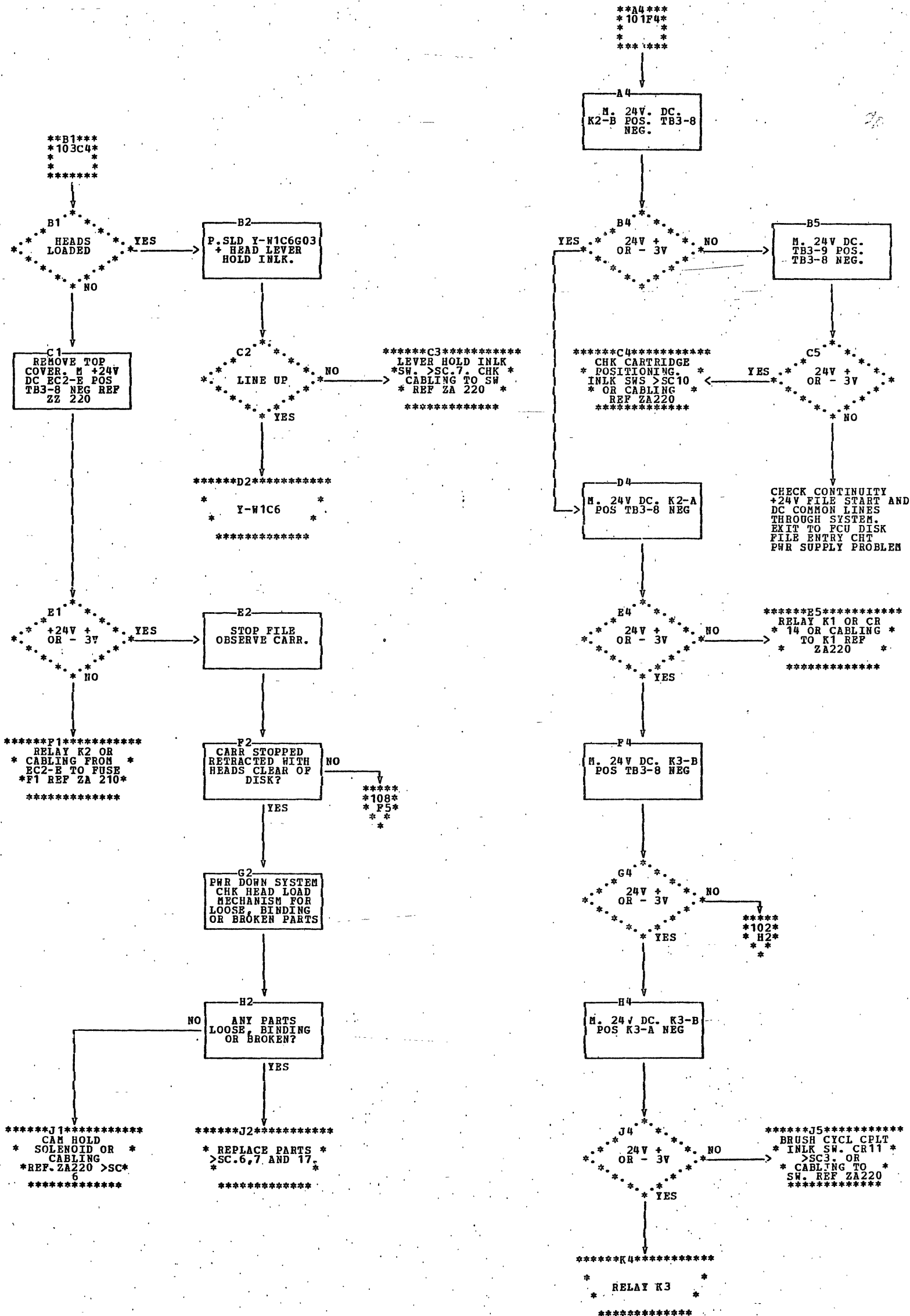
K2
CHK CONTINUITY
OF 24V DRIVER
AND COMMON
LINES THROUGH
SYSTEM.

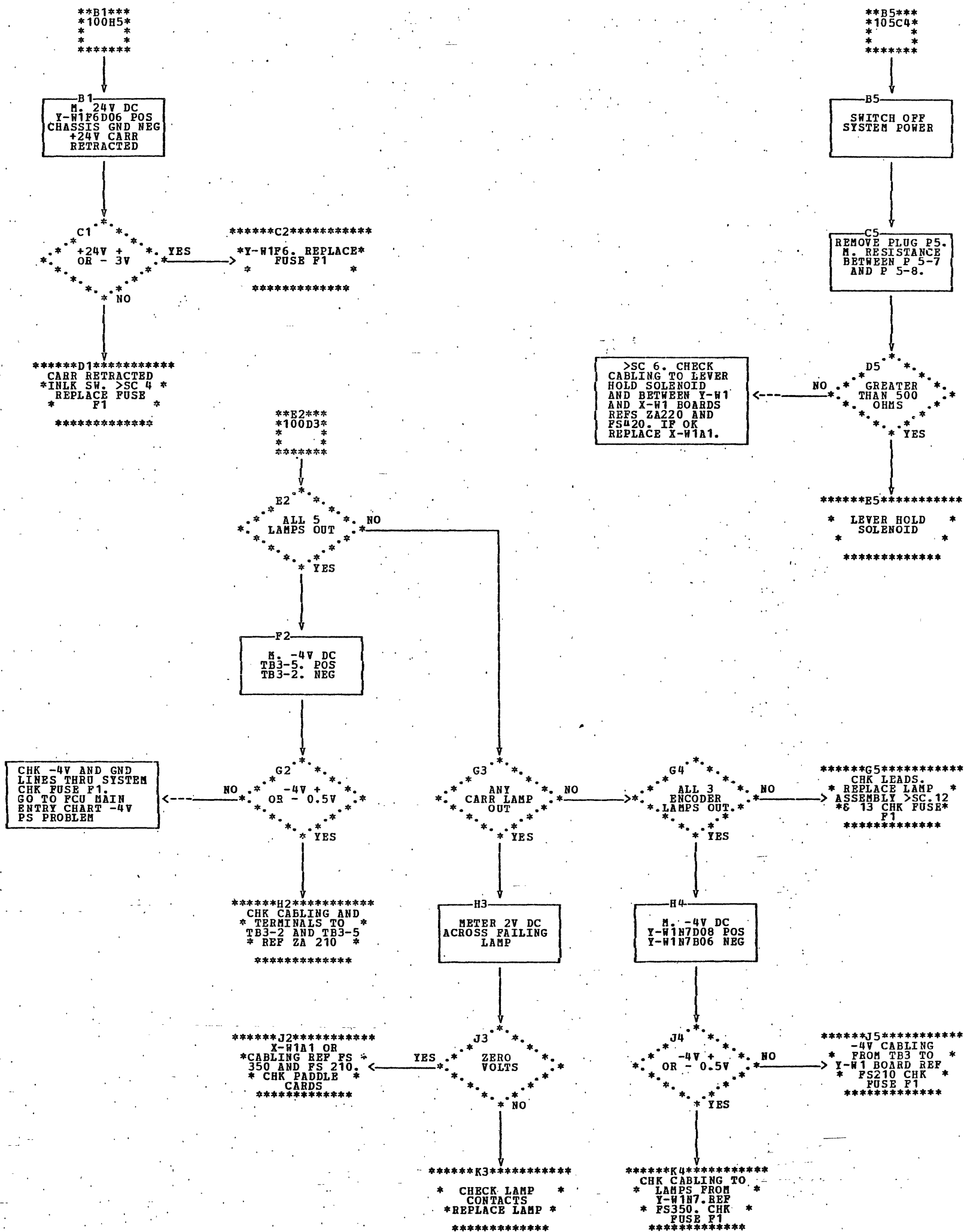
*****K4*****
* RELAY K2 OR *
* CABLING K3-A TO *
* EC2-D *
* REF. ZA220 *

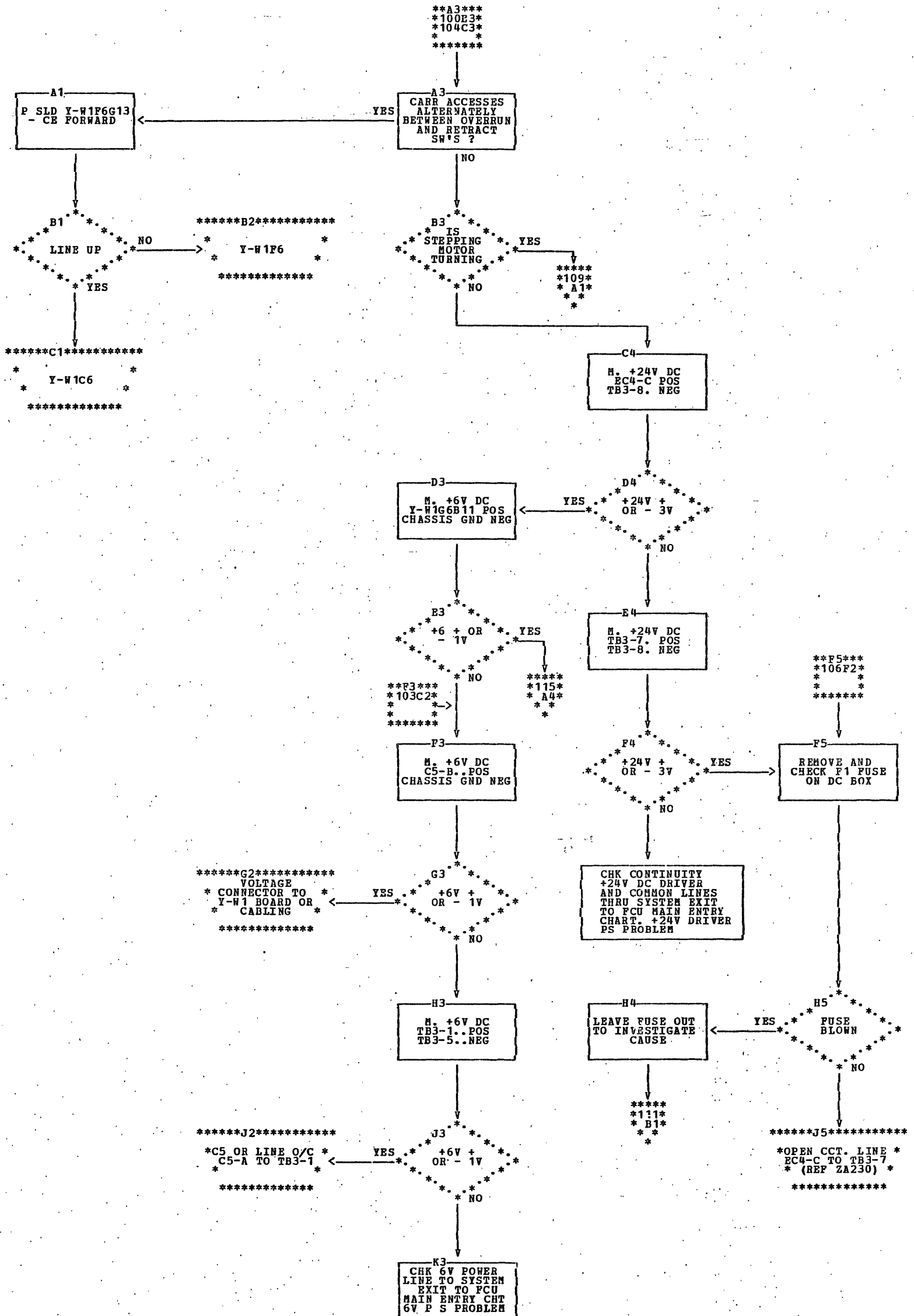


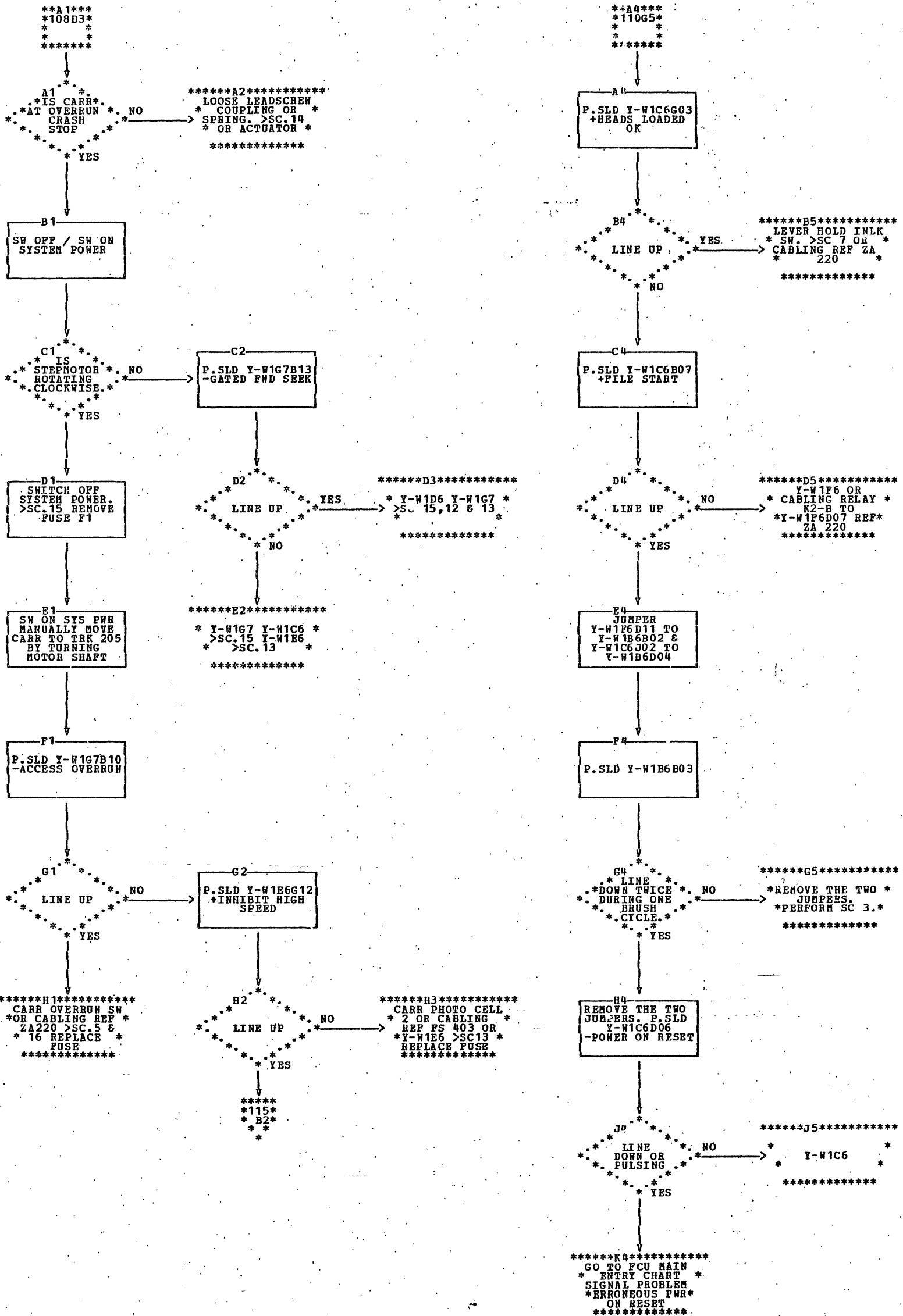


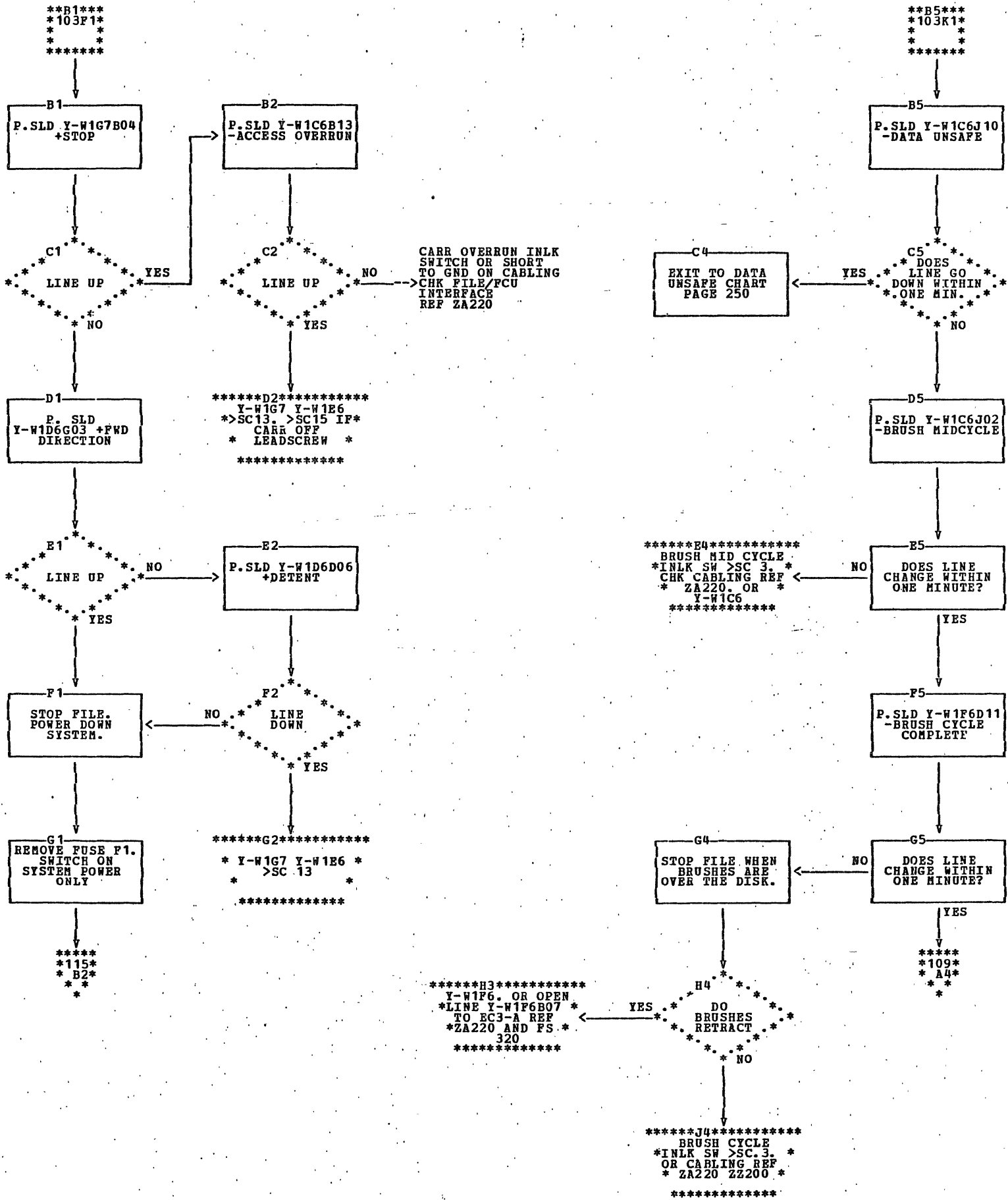


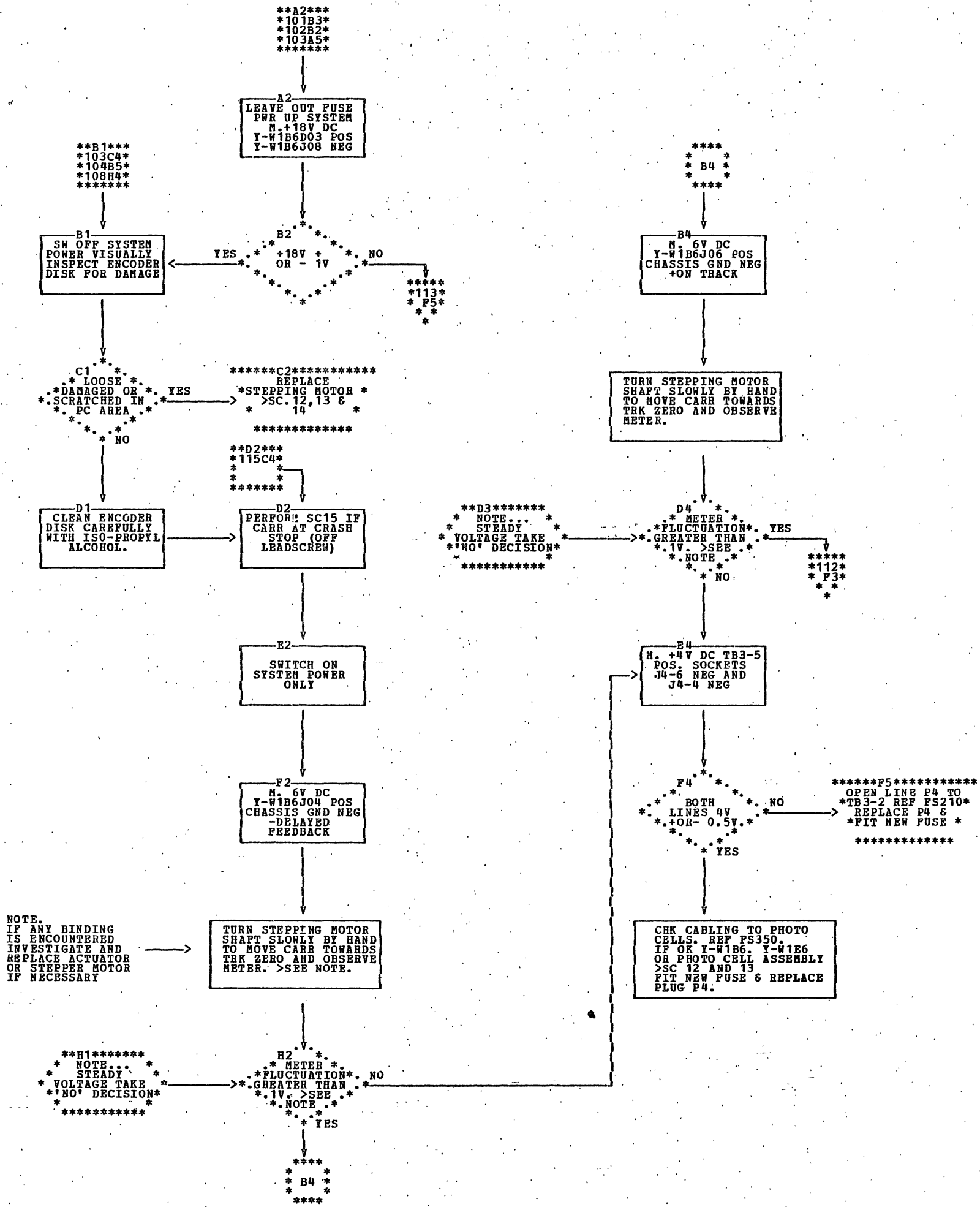


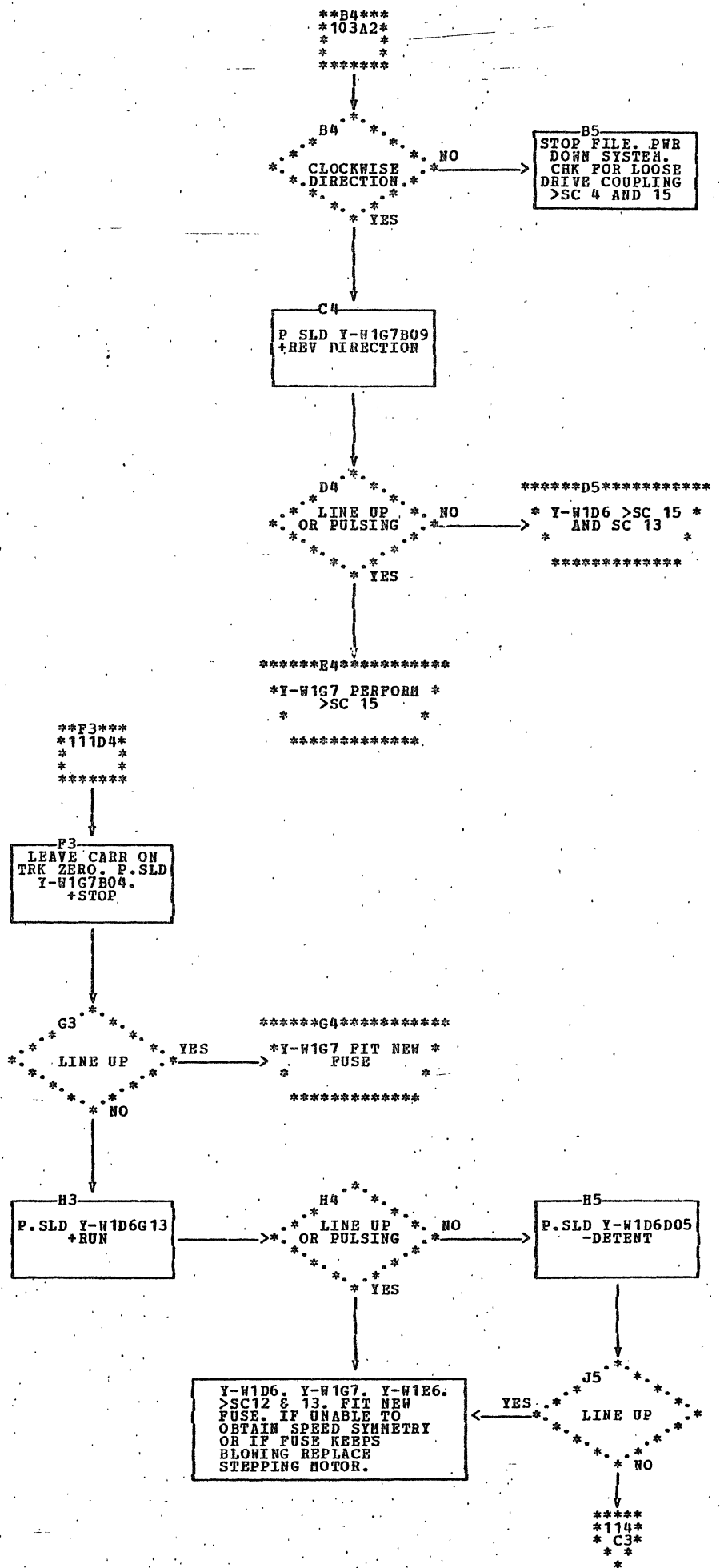


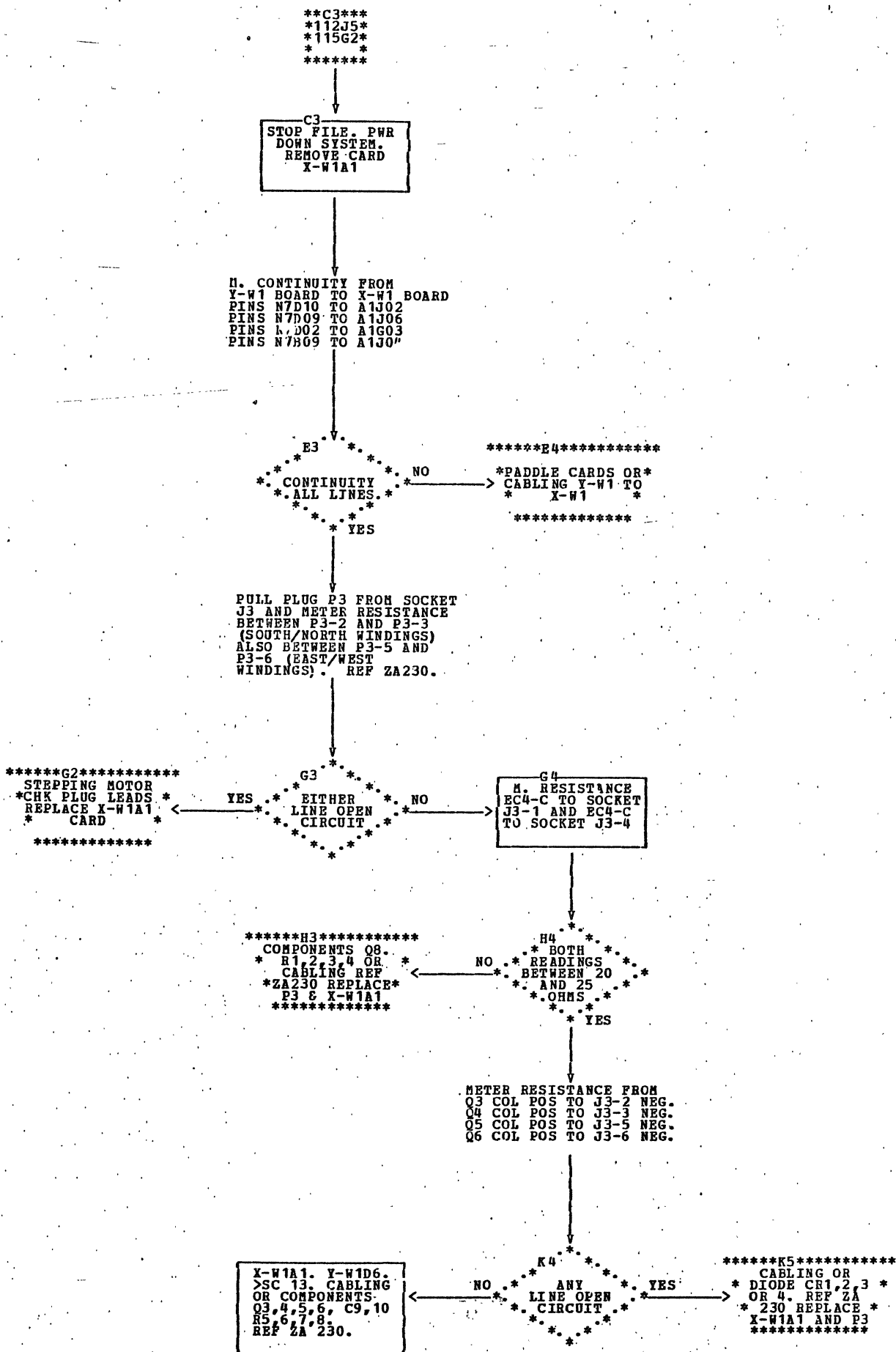




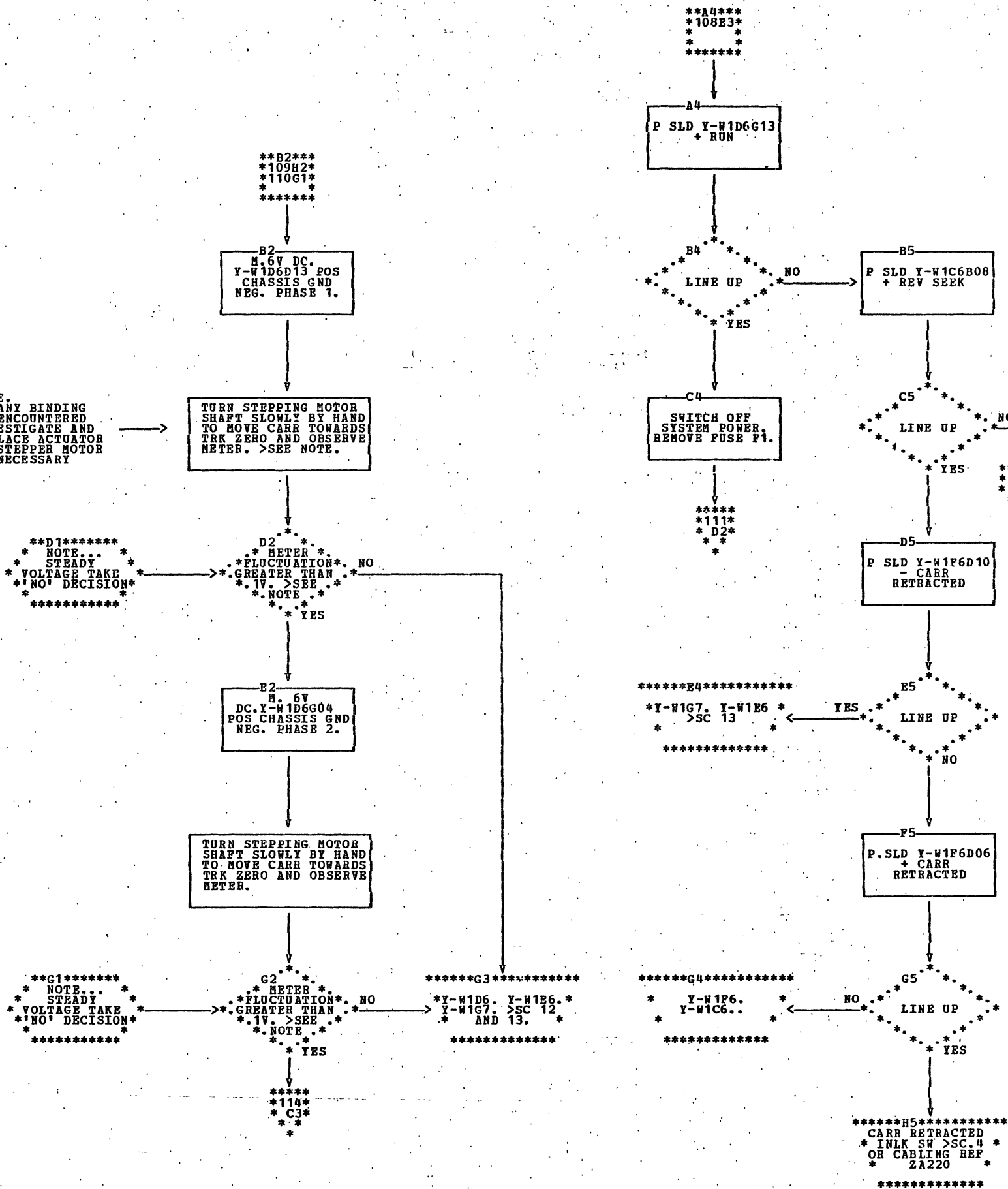


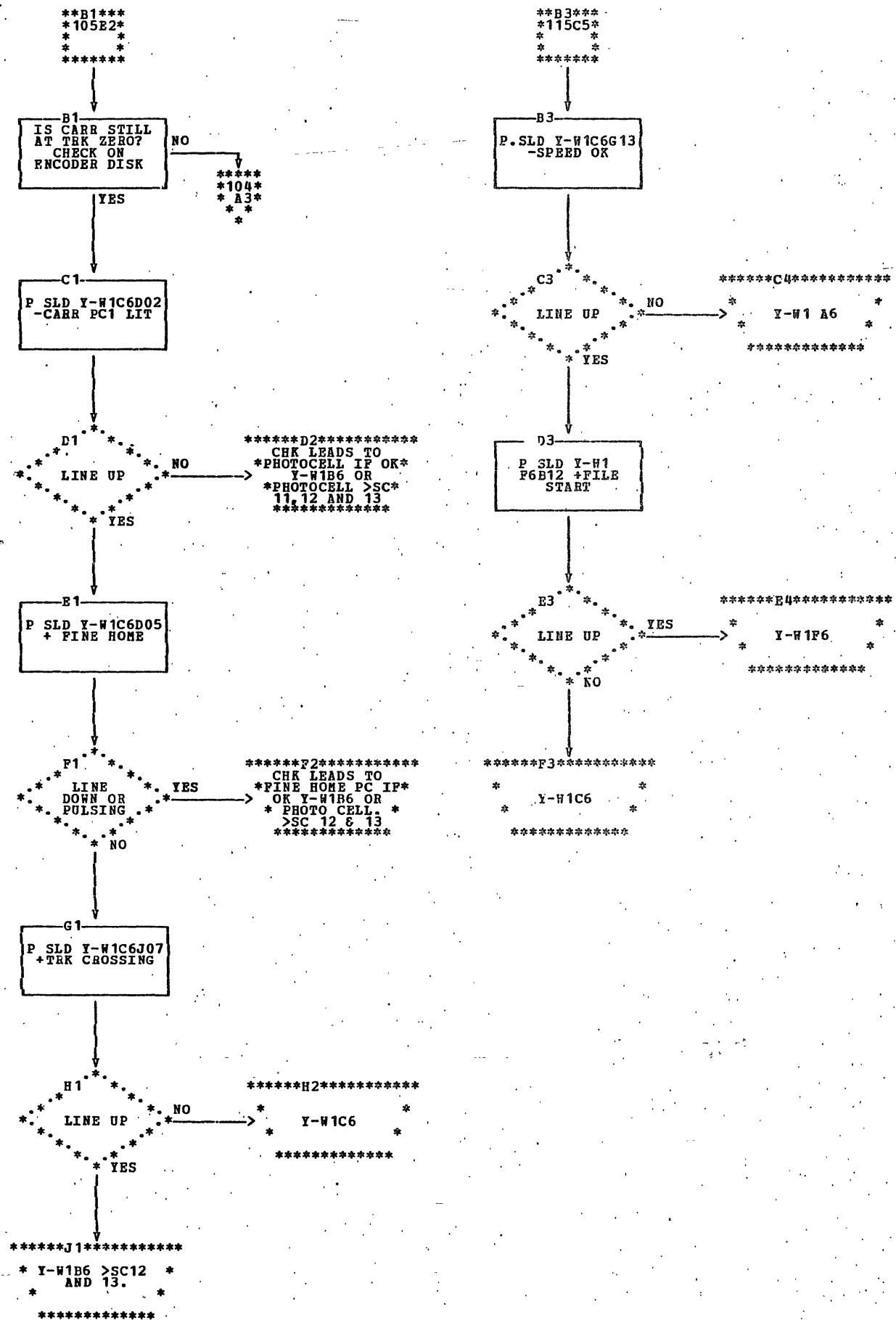


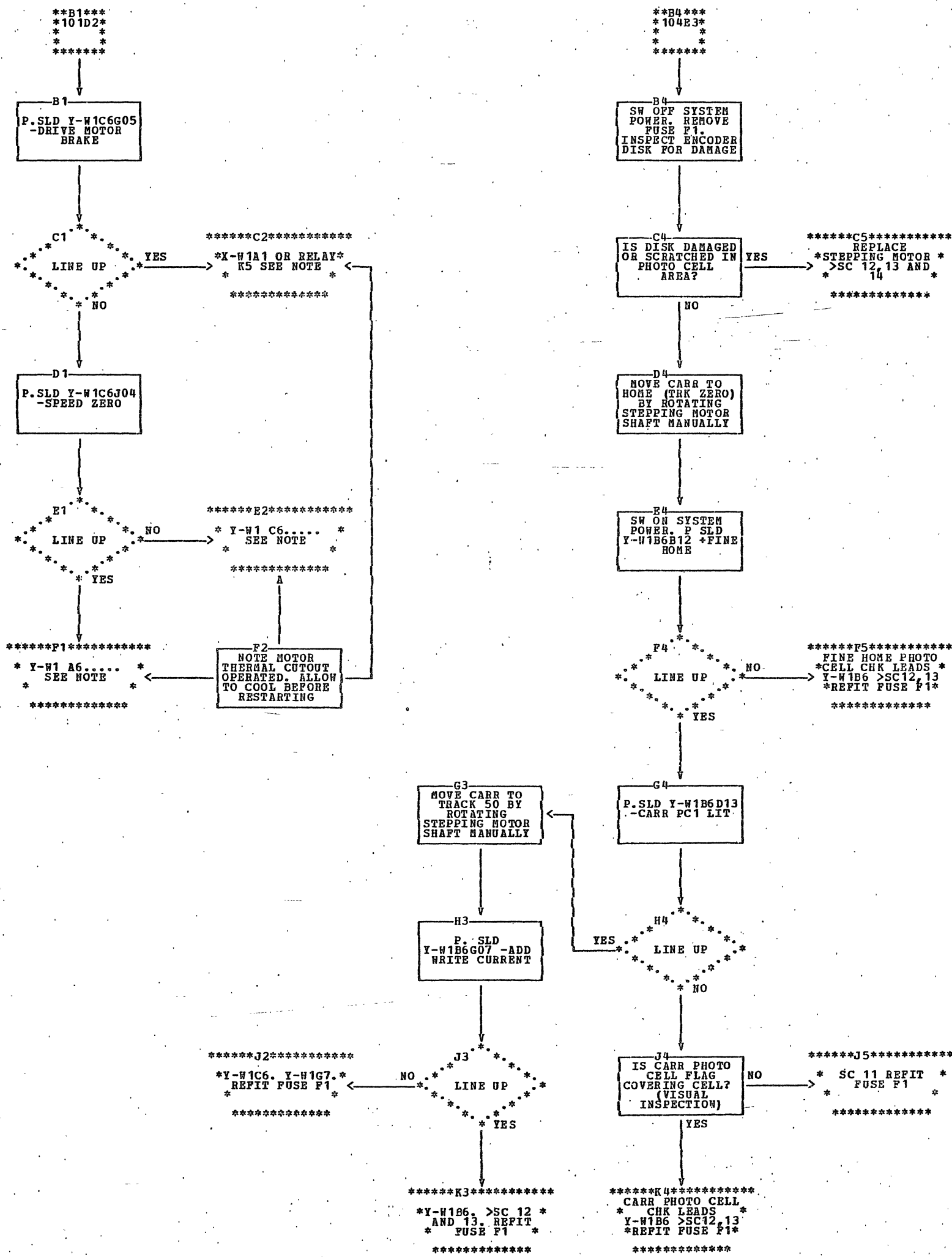


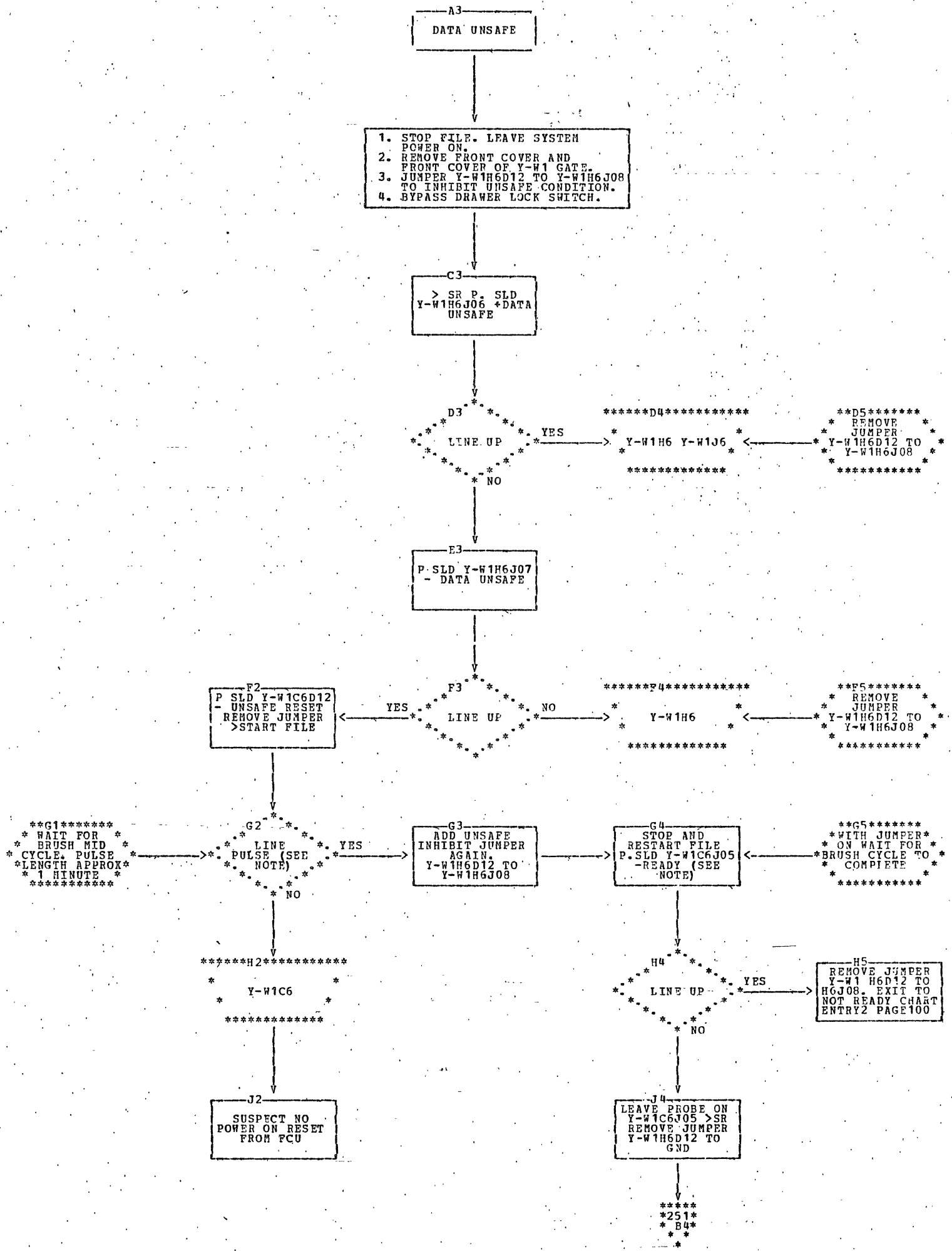


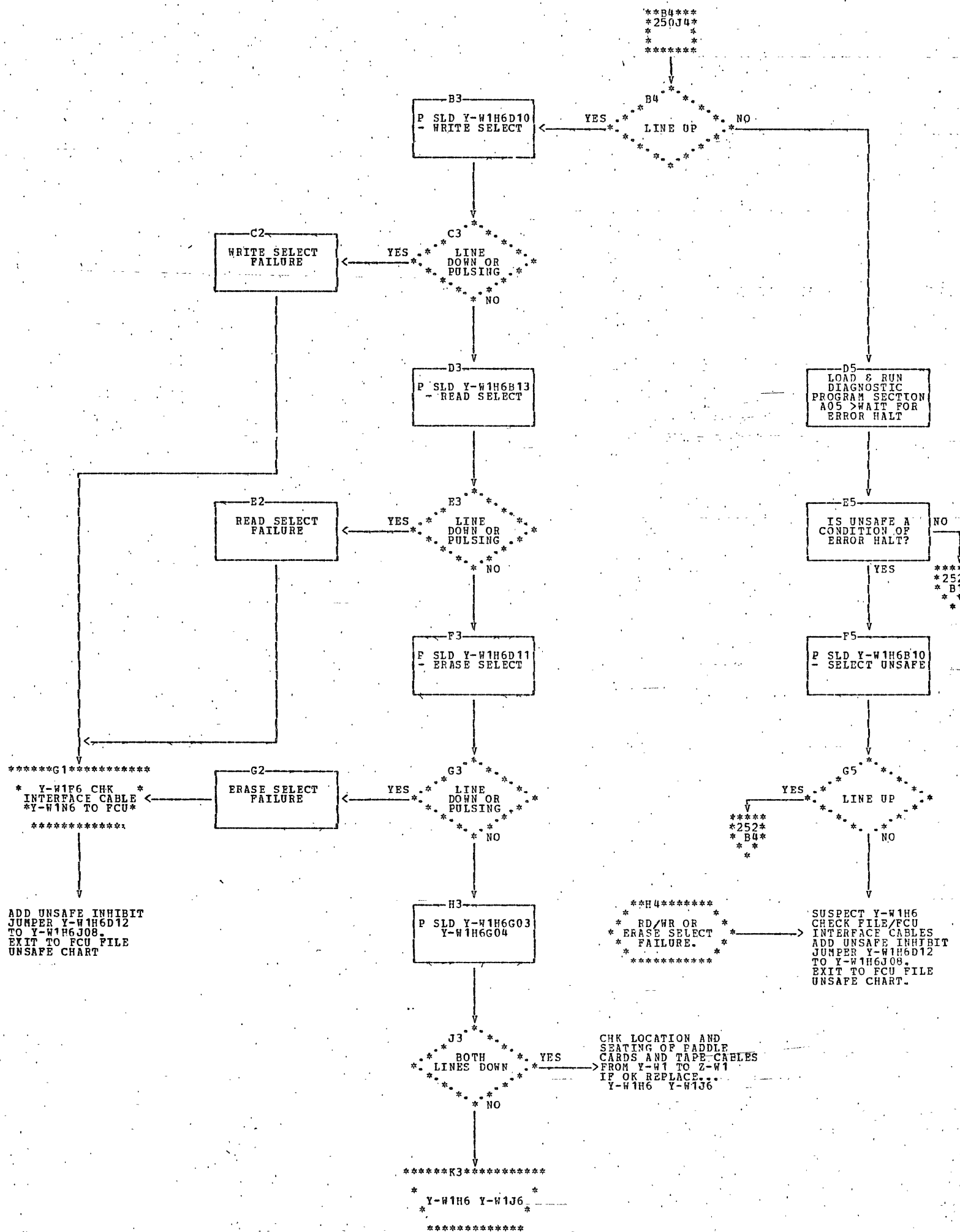
NOTE.
IF ANY BINDING
IS ENCOUNTERED
INVESTIGATE AND
REPLACE ACTUATOR
OR STEPPER MOTOR
IF NECESSARY

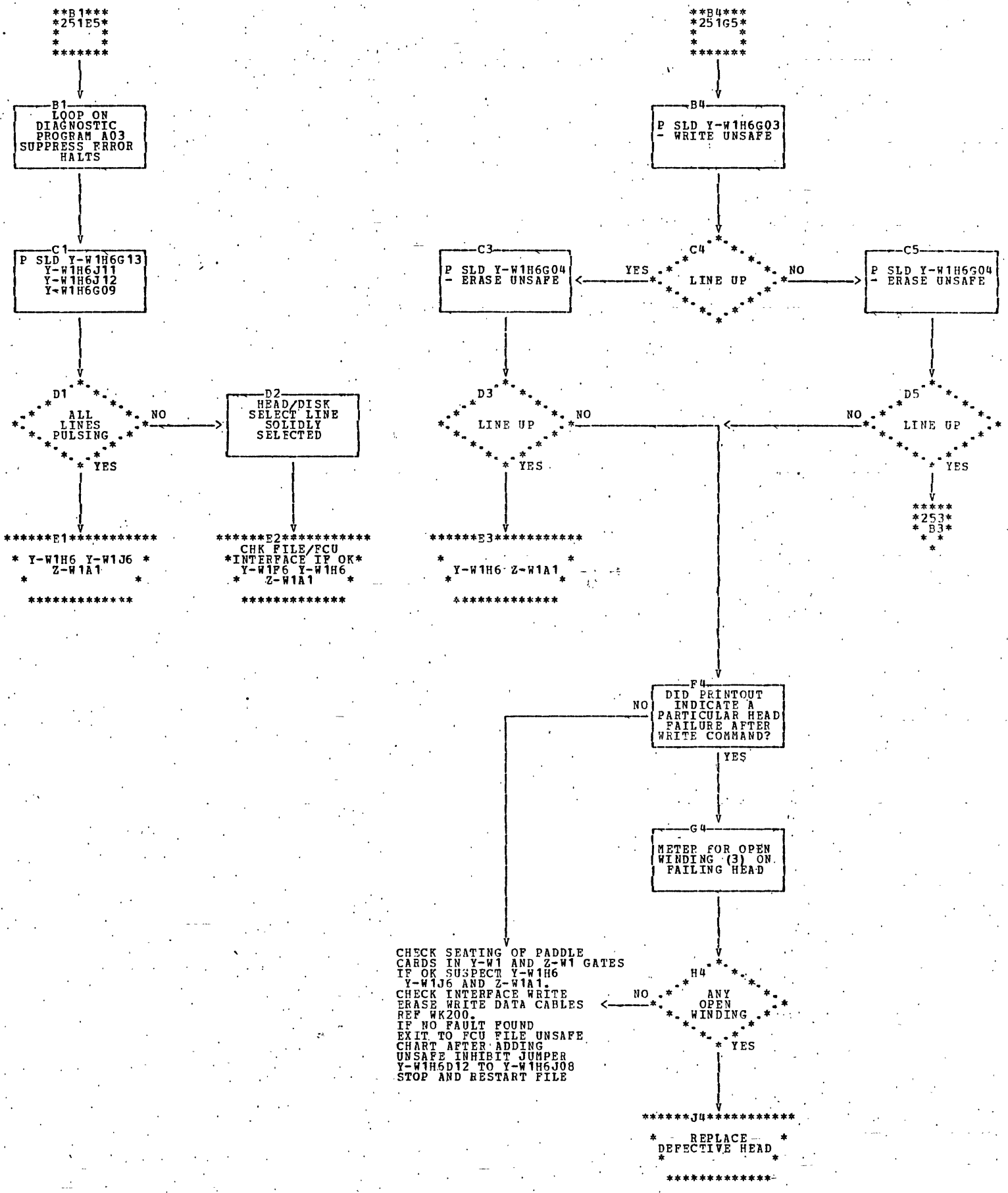












B3*
252D5
* * *

B3
ADD UNSAFE
INHIBIT JUMPER
Y-W1H6D12 TO
Y-W1H6J08 STOP,
RESTART FILE

C3
LOOP ON
DIAGNOSTIC
PROGRAM SECTION
A05

D3
JUMPER ON Y-W1
GATE J6J13 TO
B6D04. H6D10 TO
B6B08. B6B03 TO
B6D10

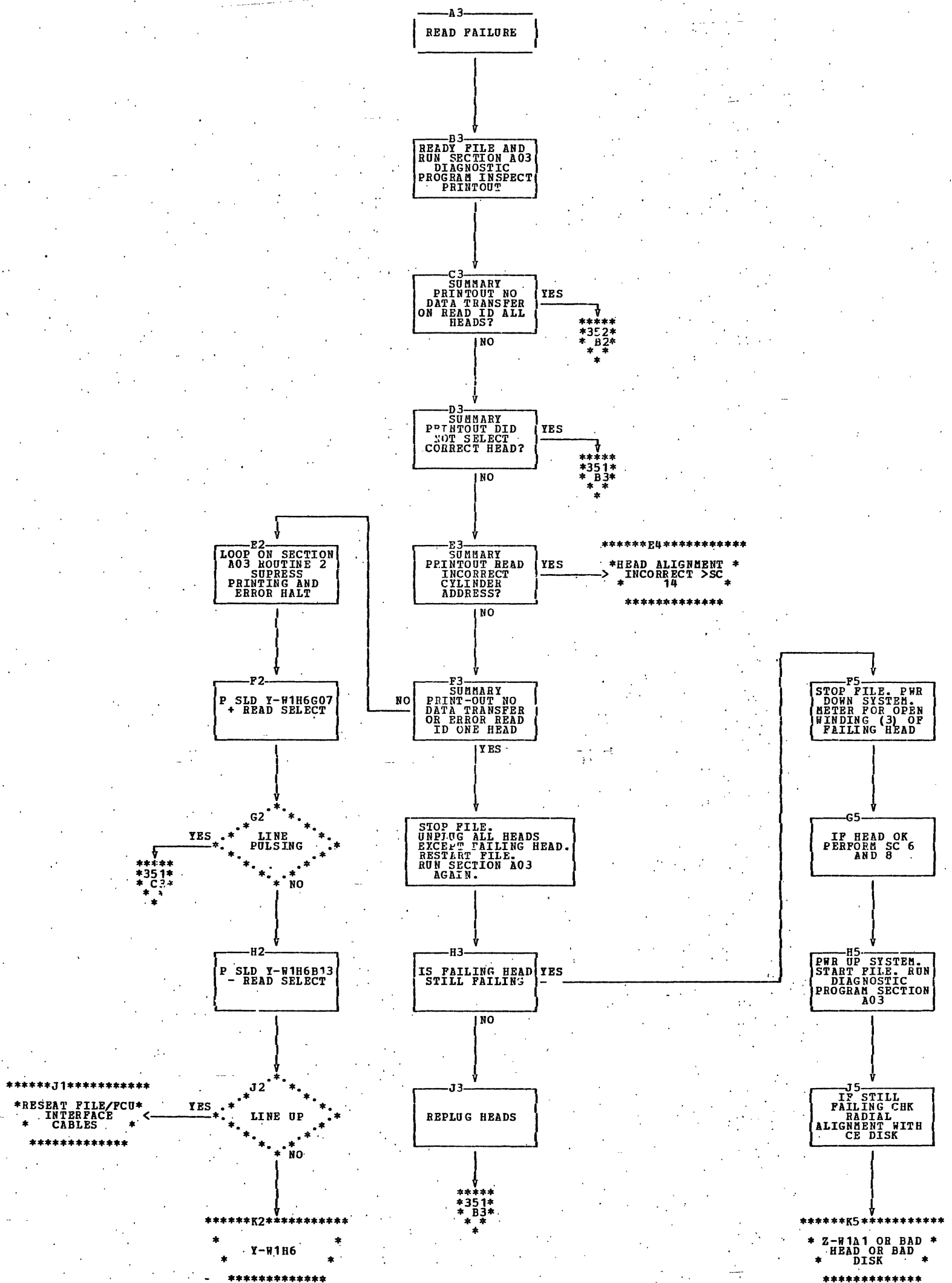
E3
P SLD Y-W1B6D07
(TAPS C)

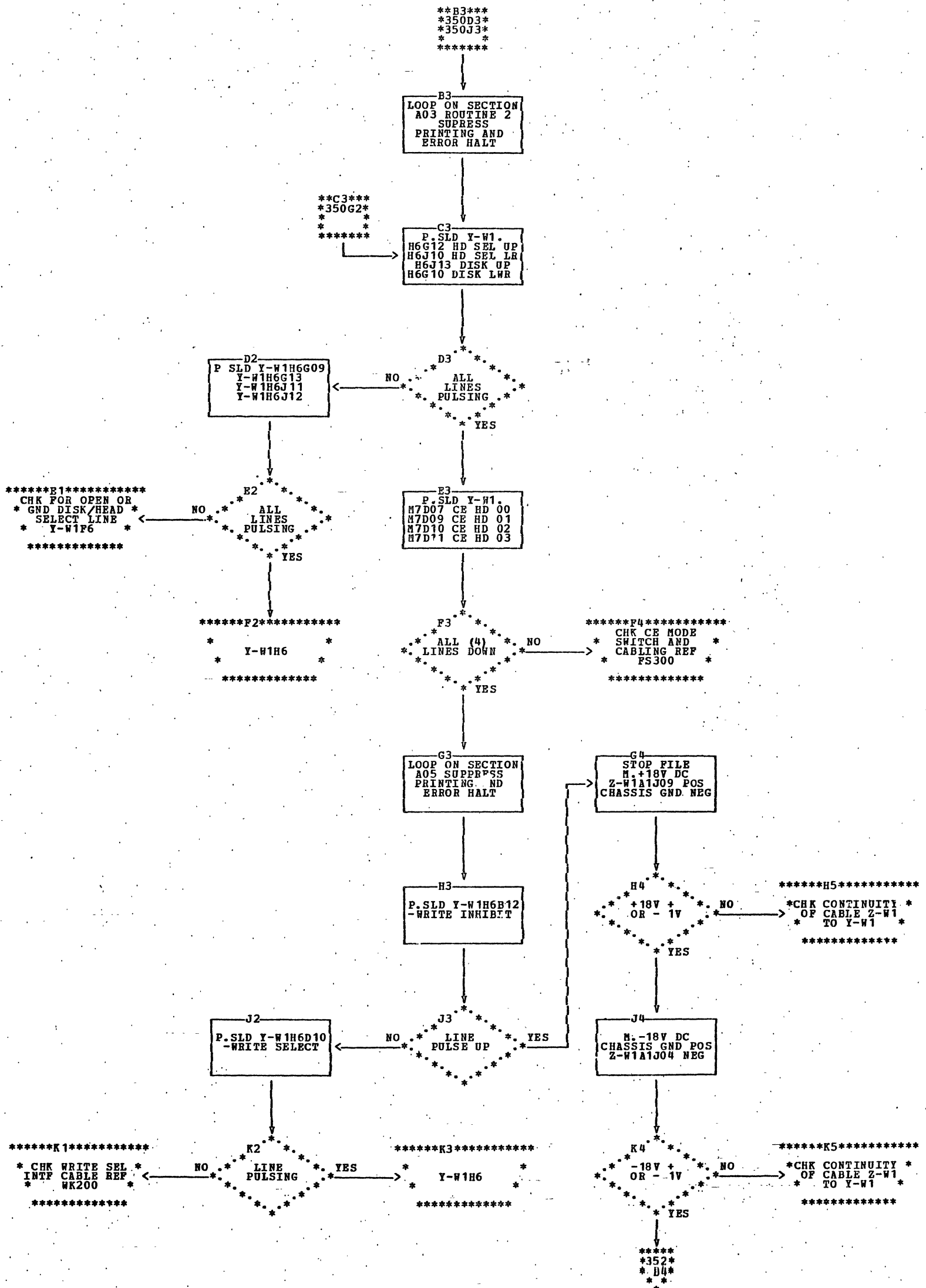
F3
* * * * *
* LINE UP * * NO *
* OF PULSING * * * * *
* * * * *
* YES *
* * * * *

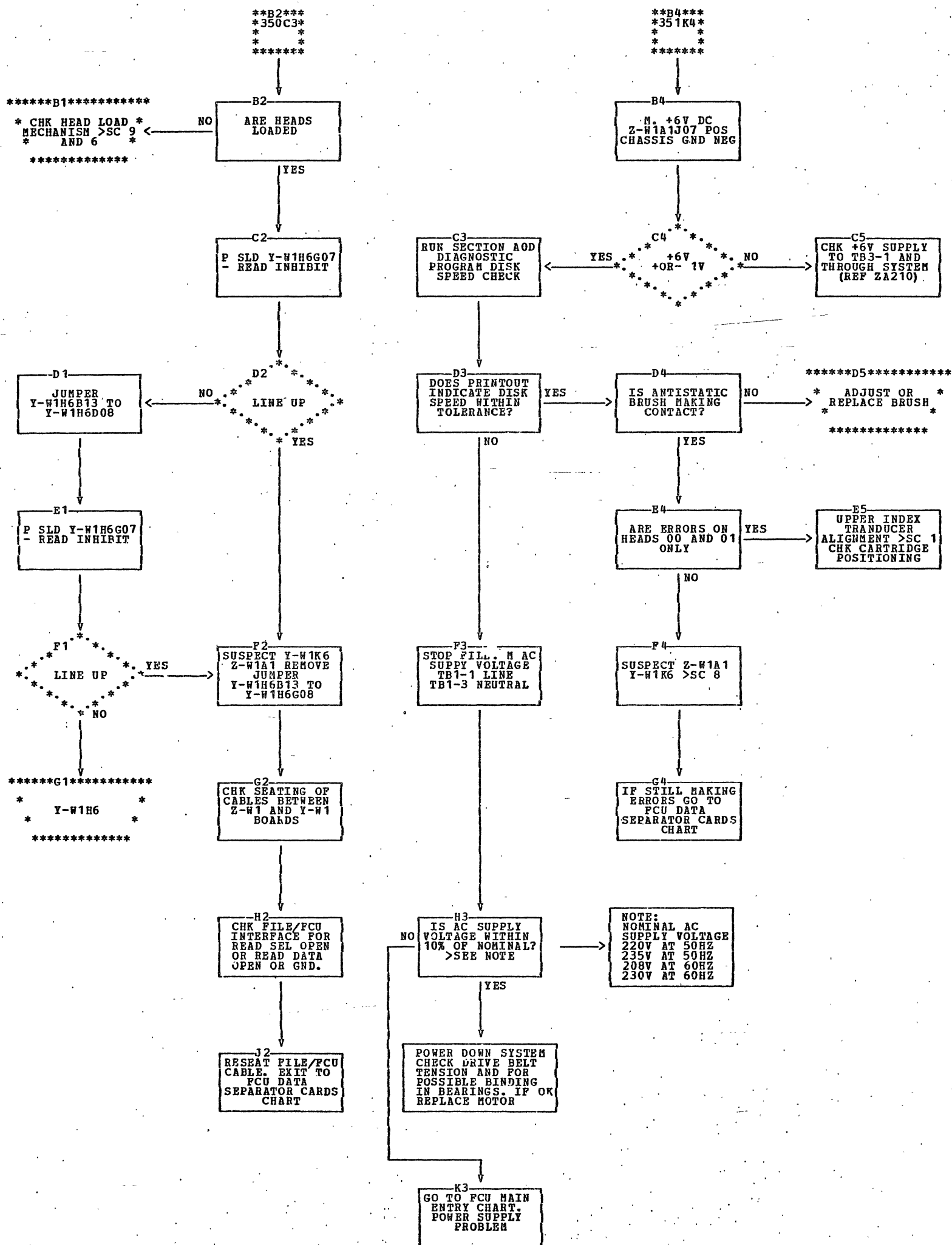
*****F4*****
* Y-W1J6 Y-W1H6 *

C4K FILE/FCU INTERFACE
CABLES LEAVE UNSAFE
INHIBIT JUMPER Y-W1
H6D12 TO H6J08
REMOVE OTHER THREE
JUMPERS. EXIT TO
FCU FILE UNSAFE CHART

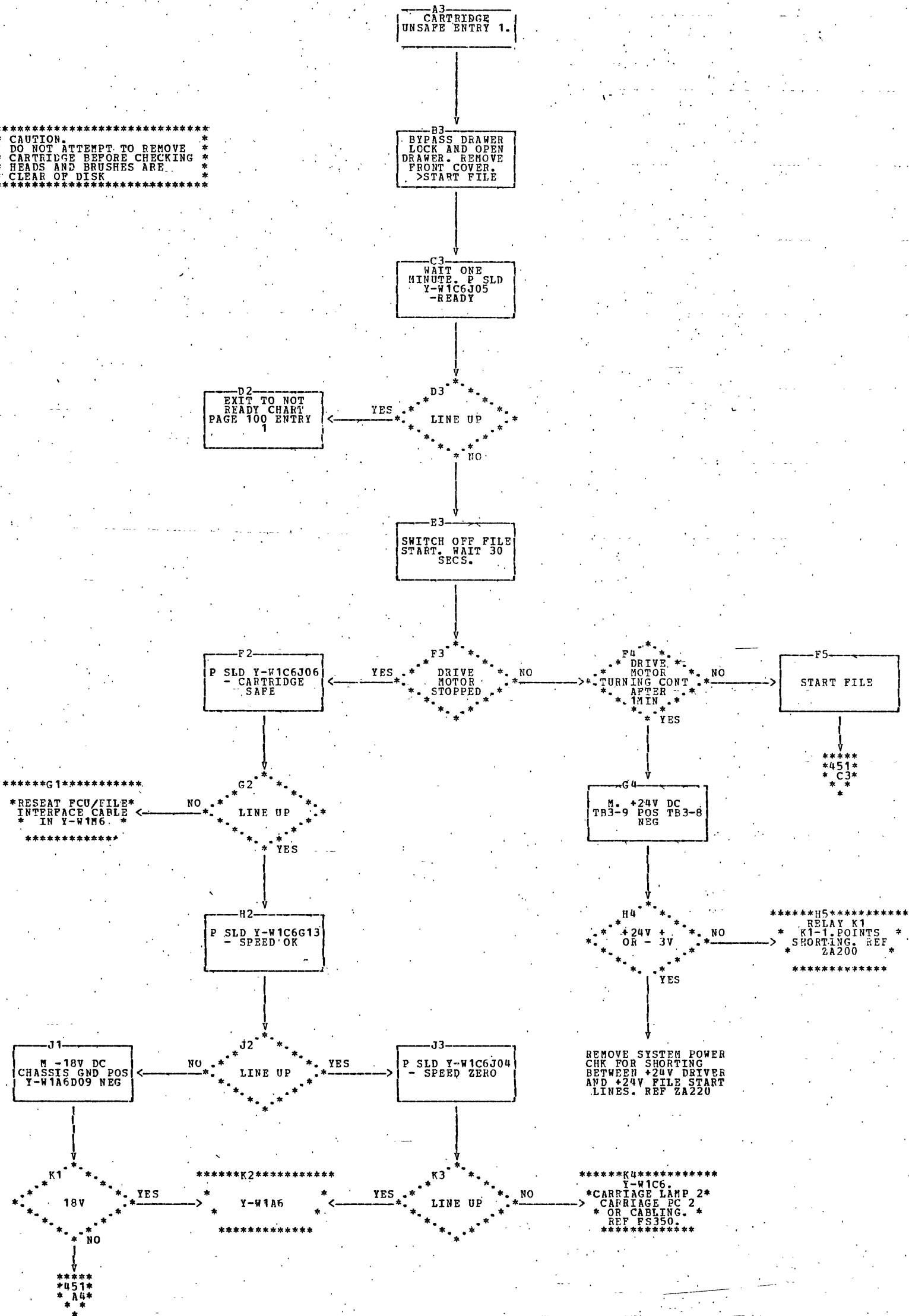
G4***
DOUBLE FREQ
WRITE DATA
MISSING OR WR
SELECT LINE
FAILURE

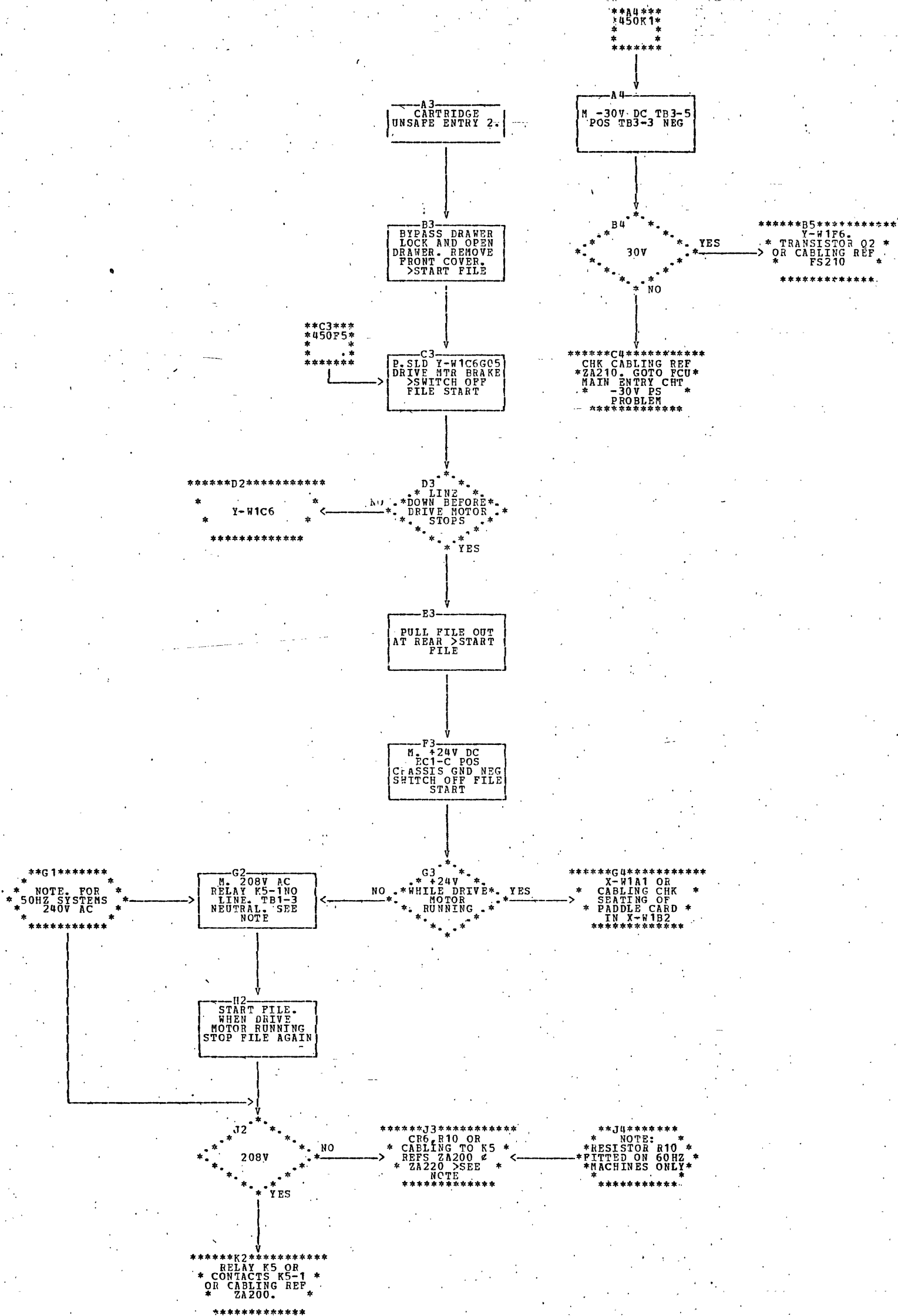


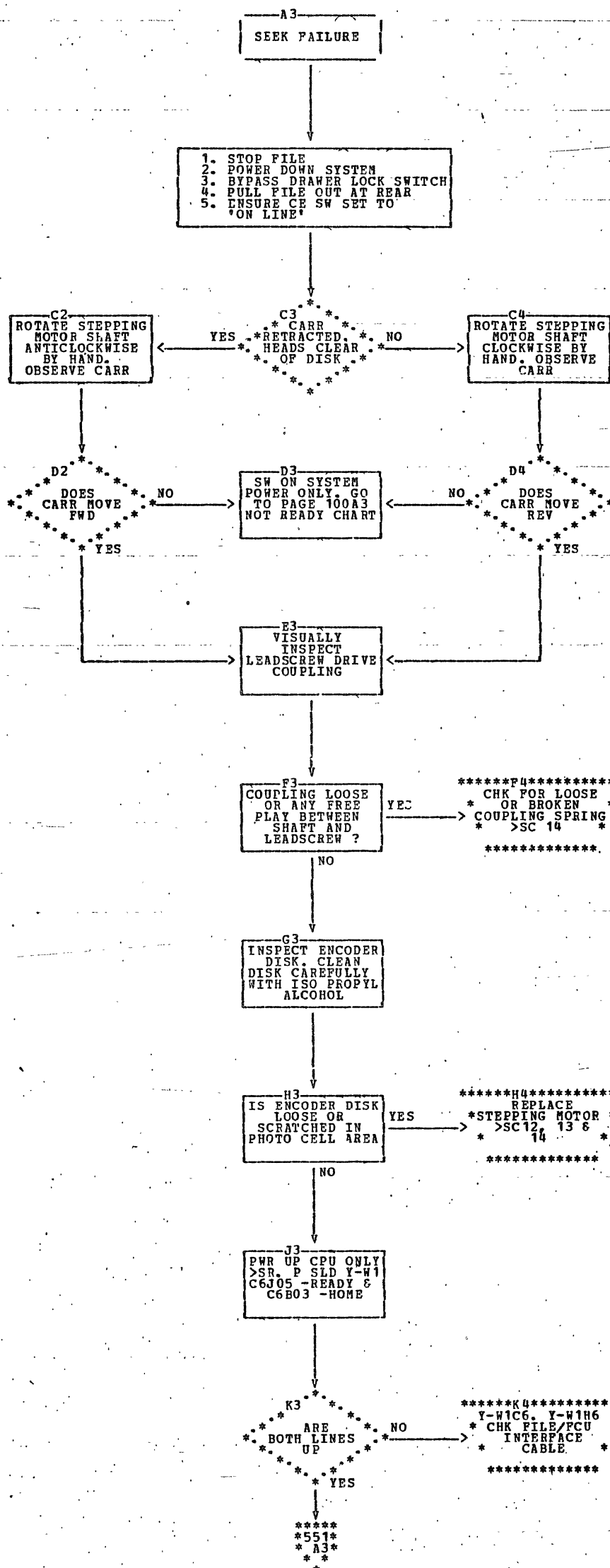


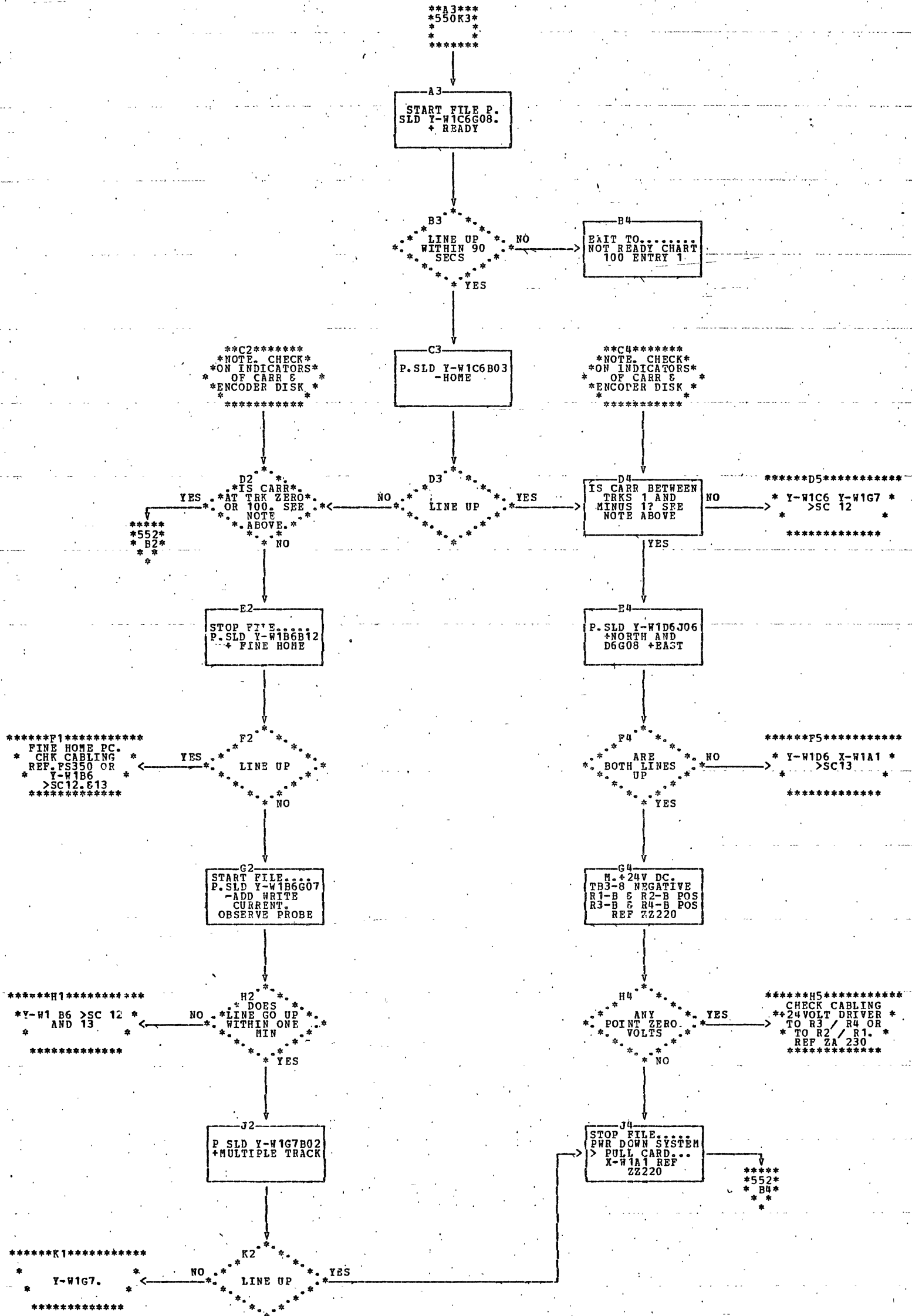


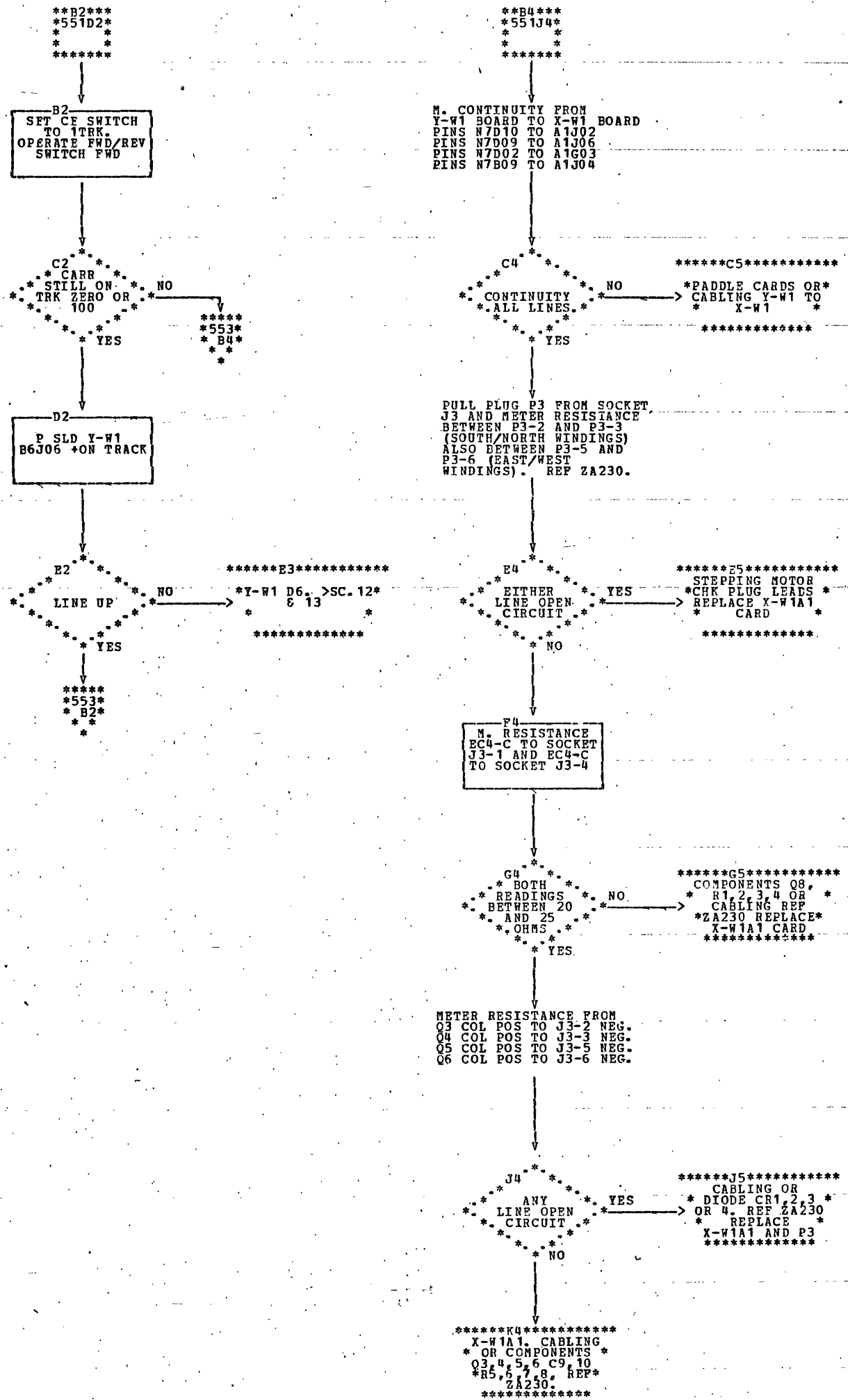
 * CAUTION.
 * DO NOT ATTEMPT TO REMOVE
 * CARTRIDGE BEFORE CHECKING
 * HEADS AND BRUSHES ARE
 * CLEAR OF DISK

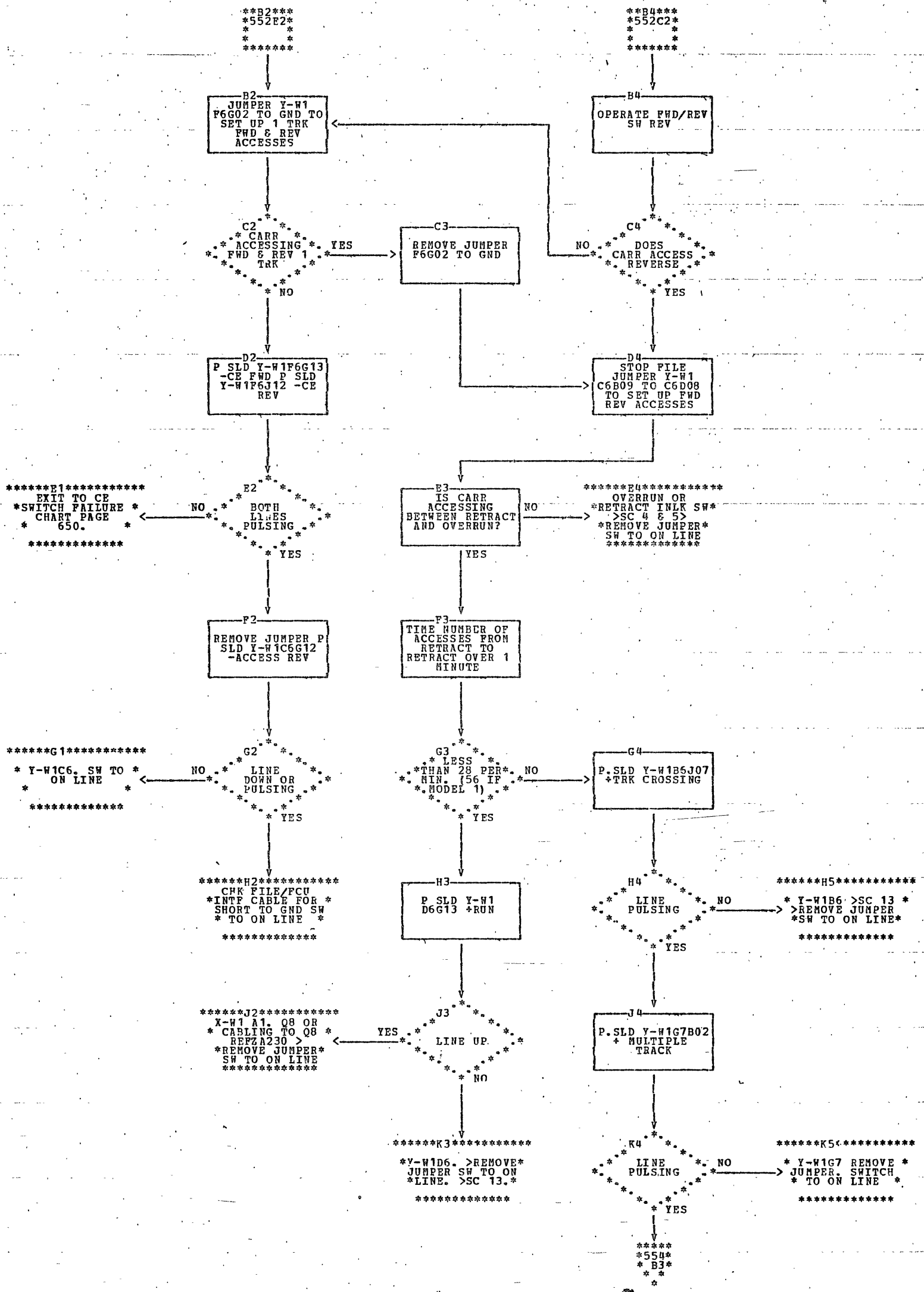






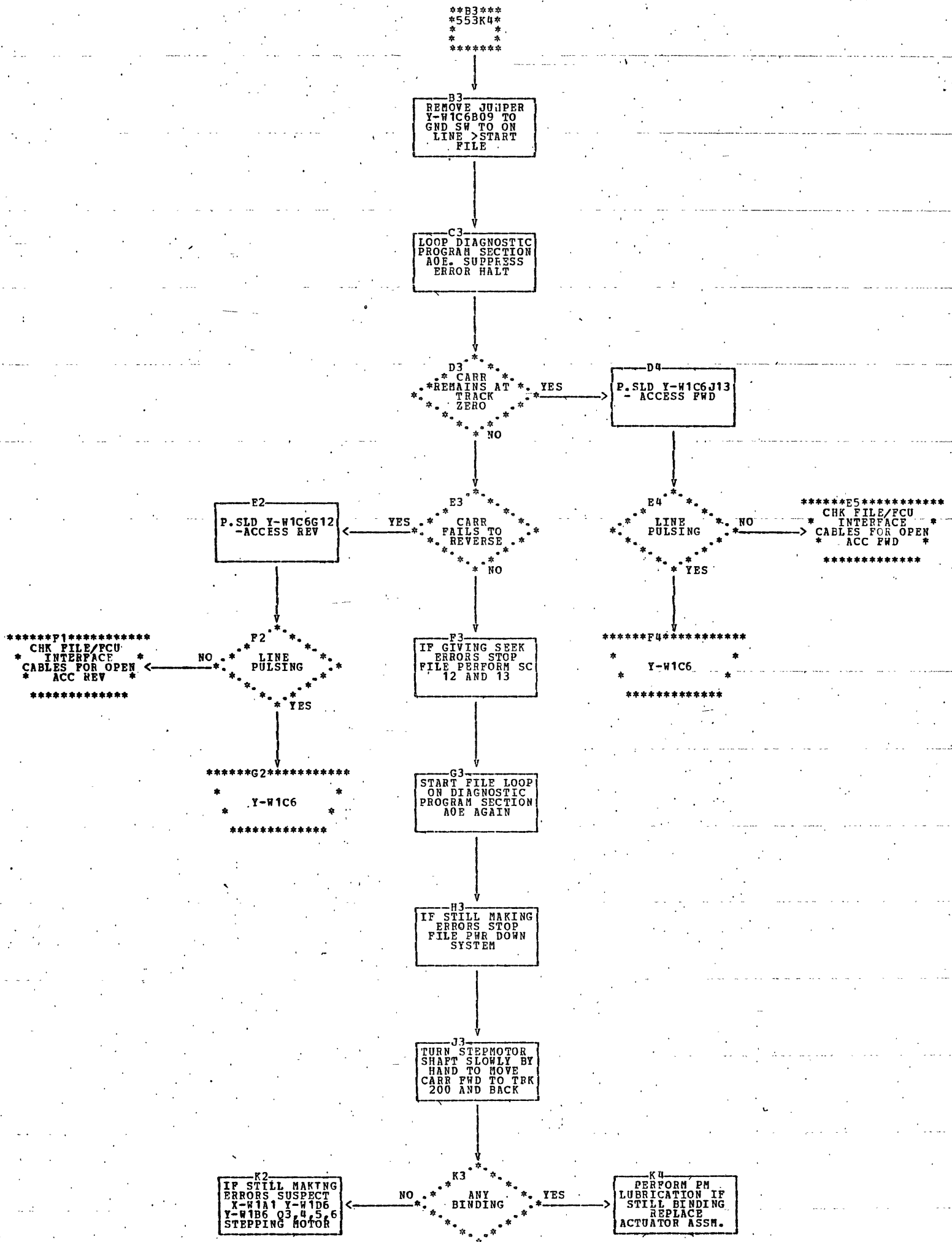


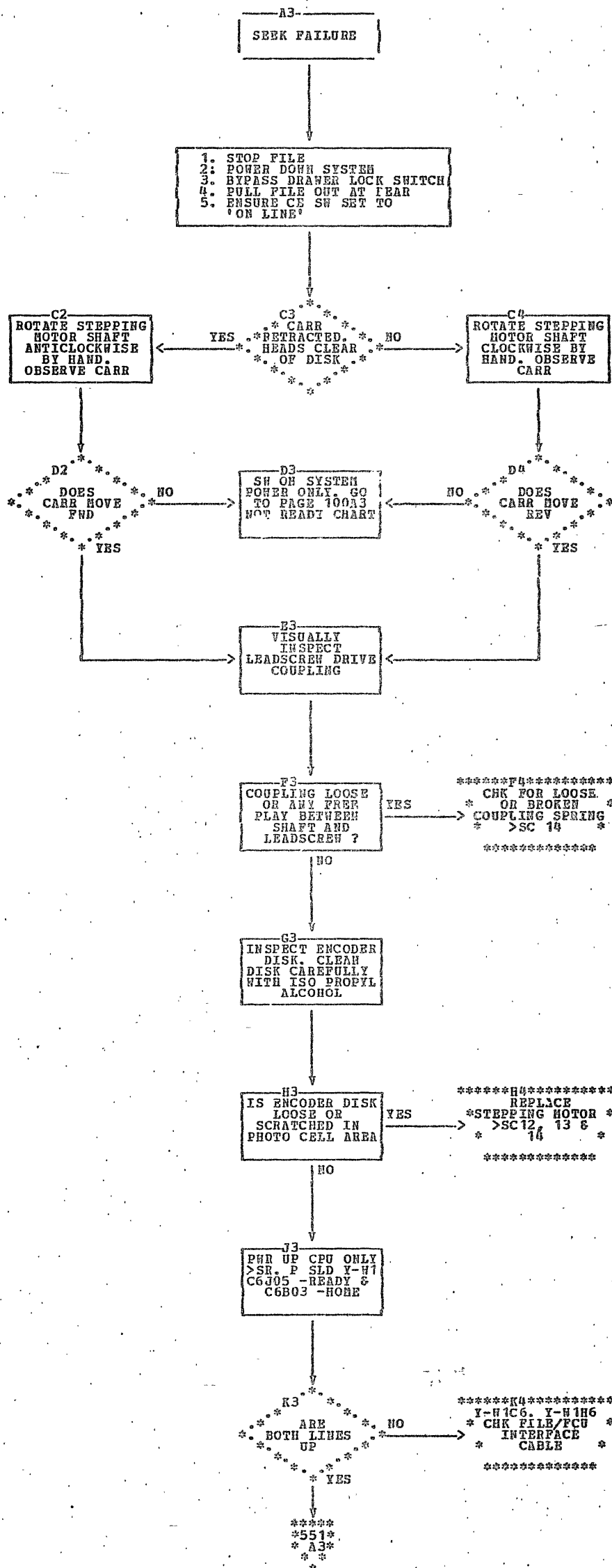


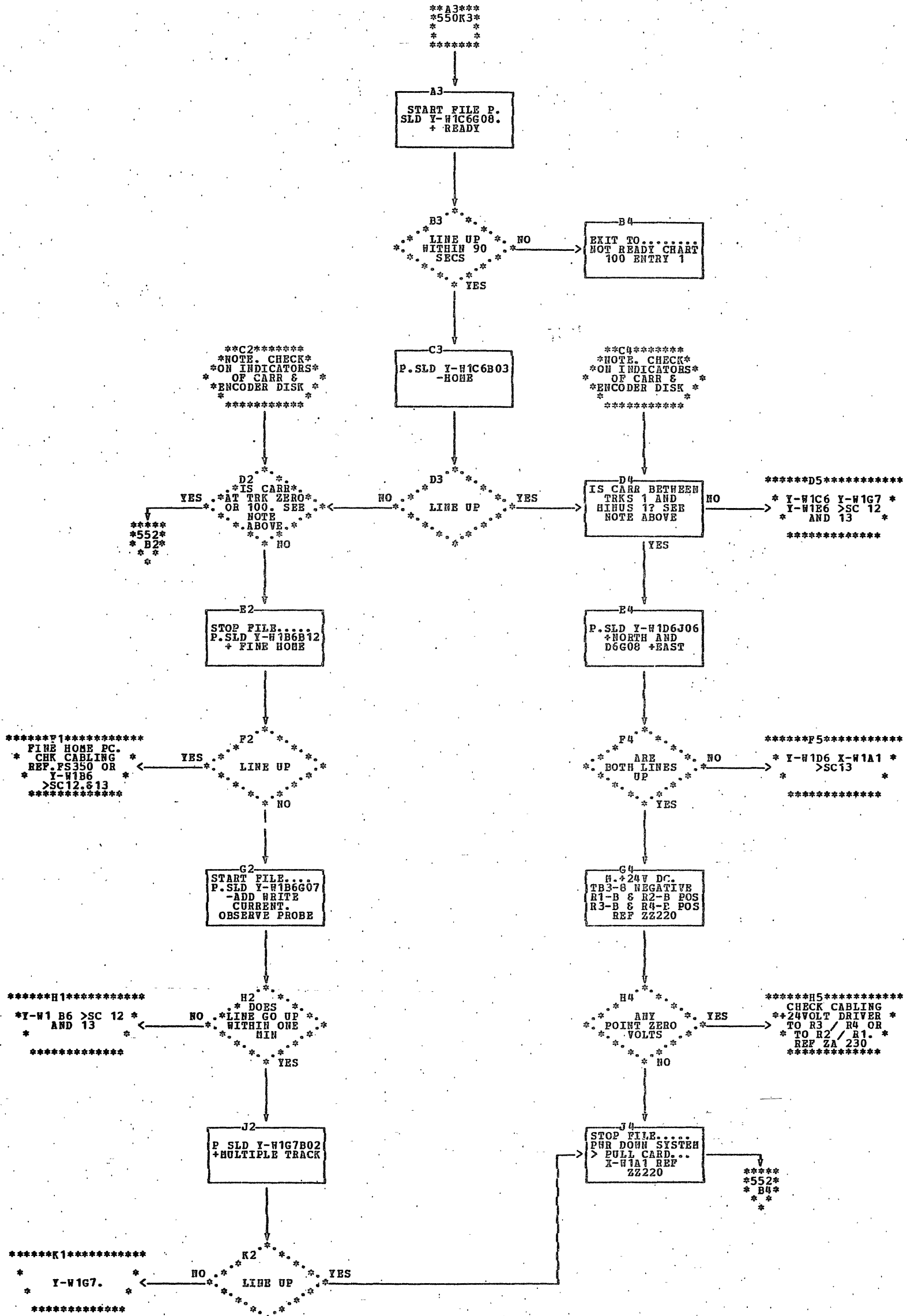


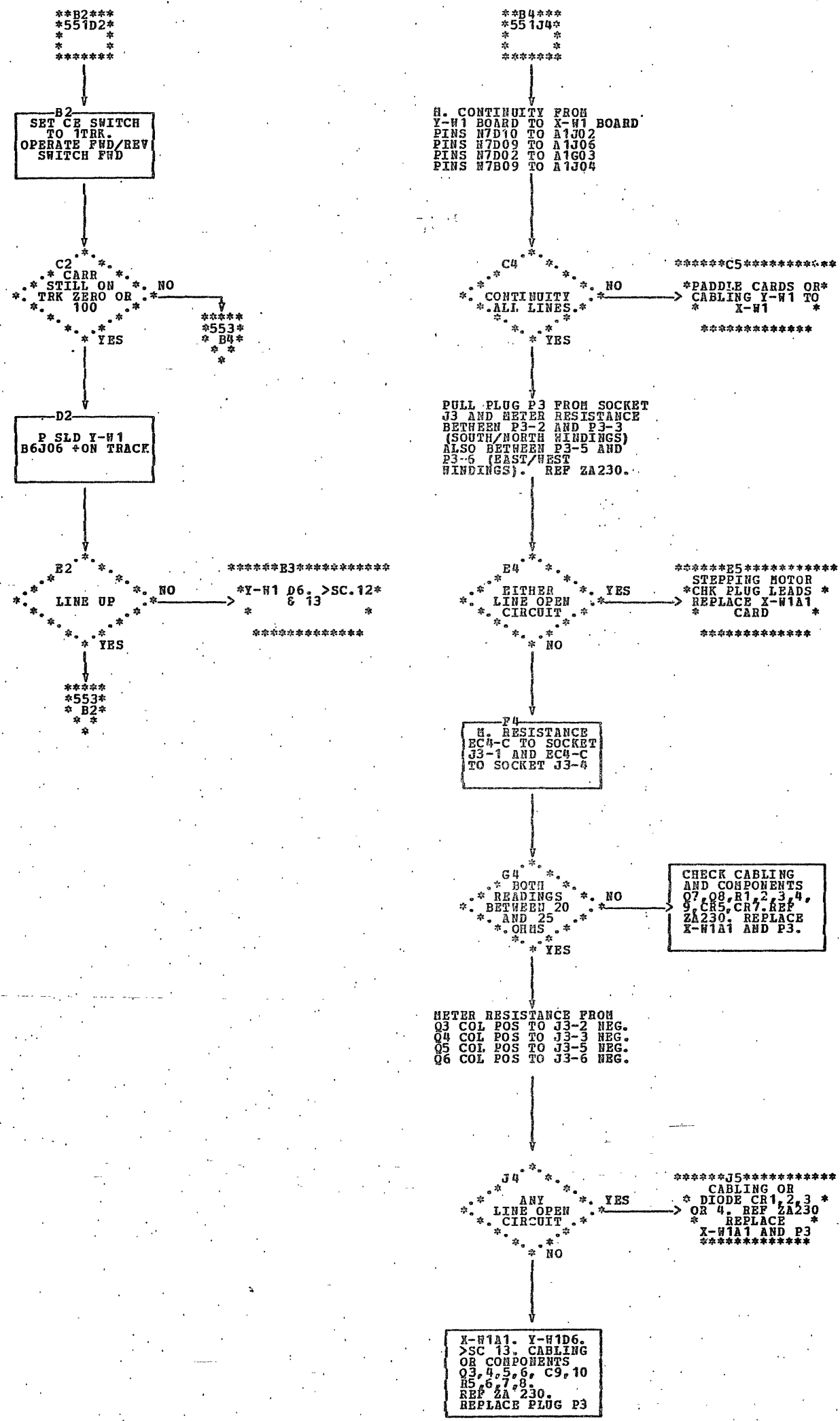
5444 DISK FILE MAP CHARTS
SEEK FAILURE

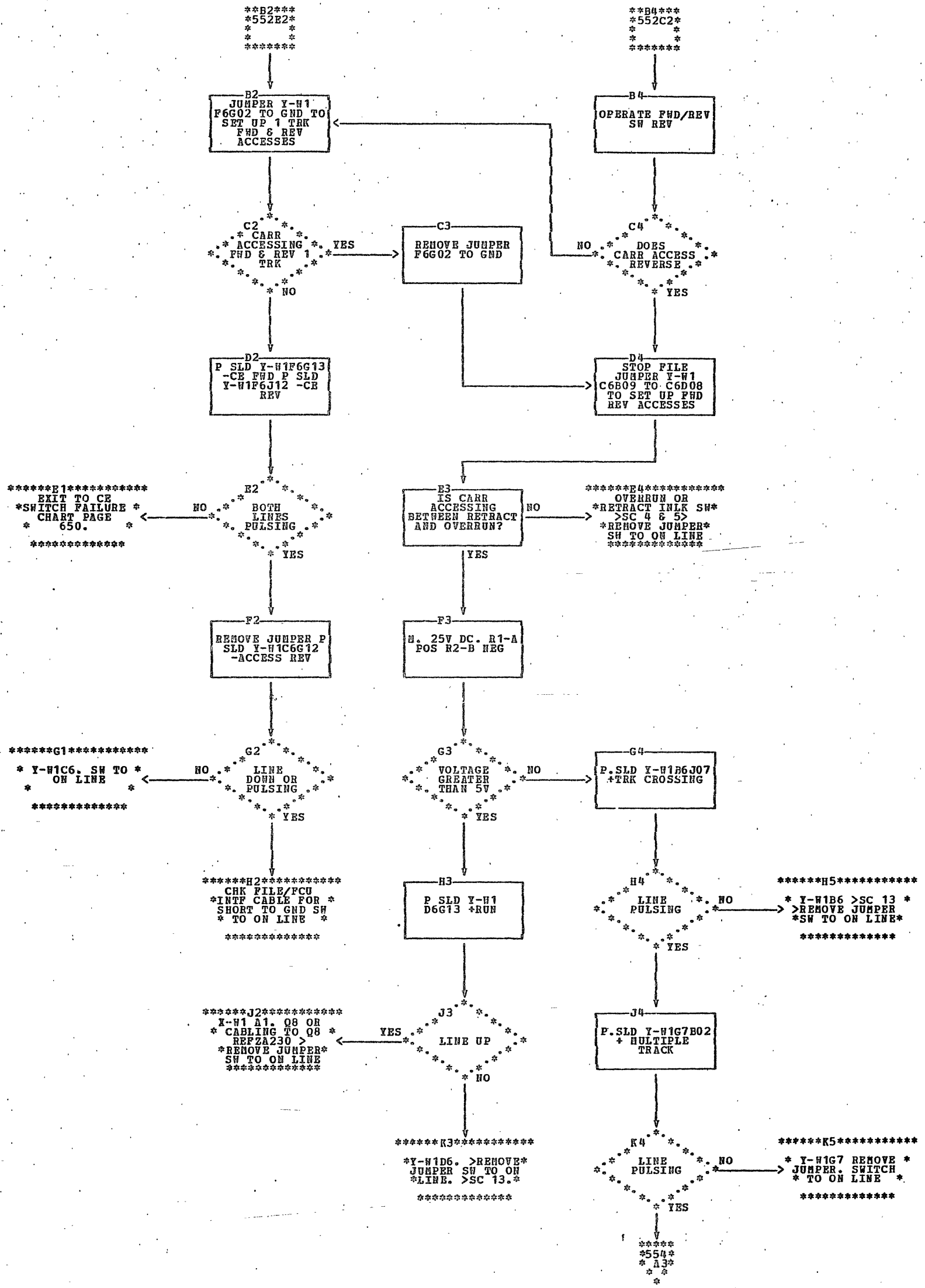
PREV EC 392664 PRES EC 392667 PN 2600551 SHEET 5 OF 5

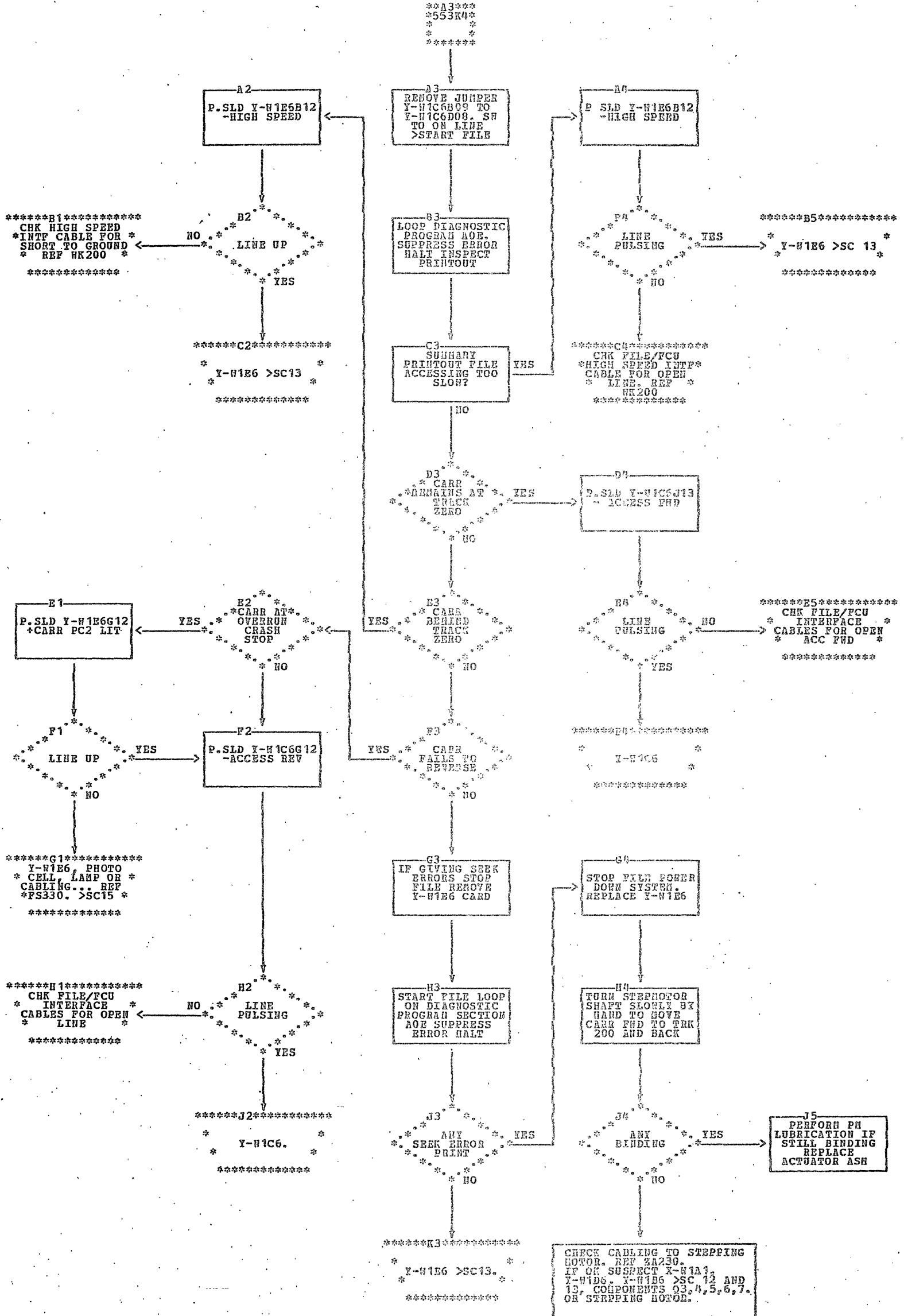


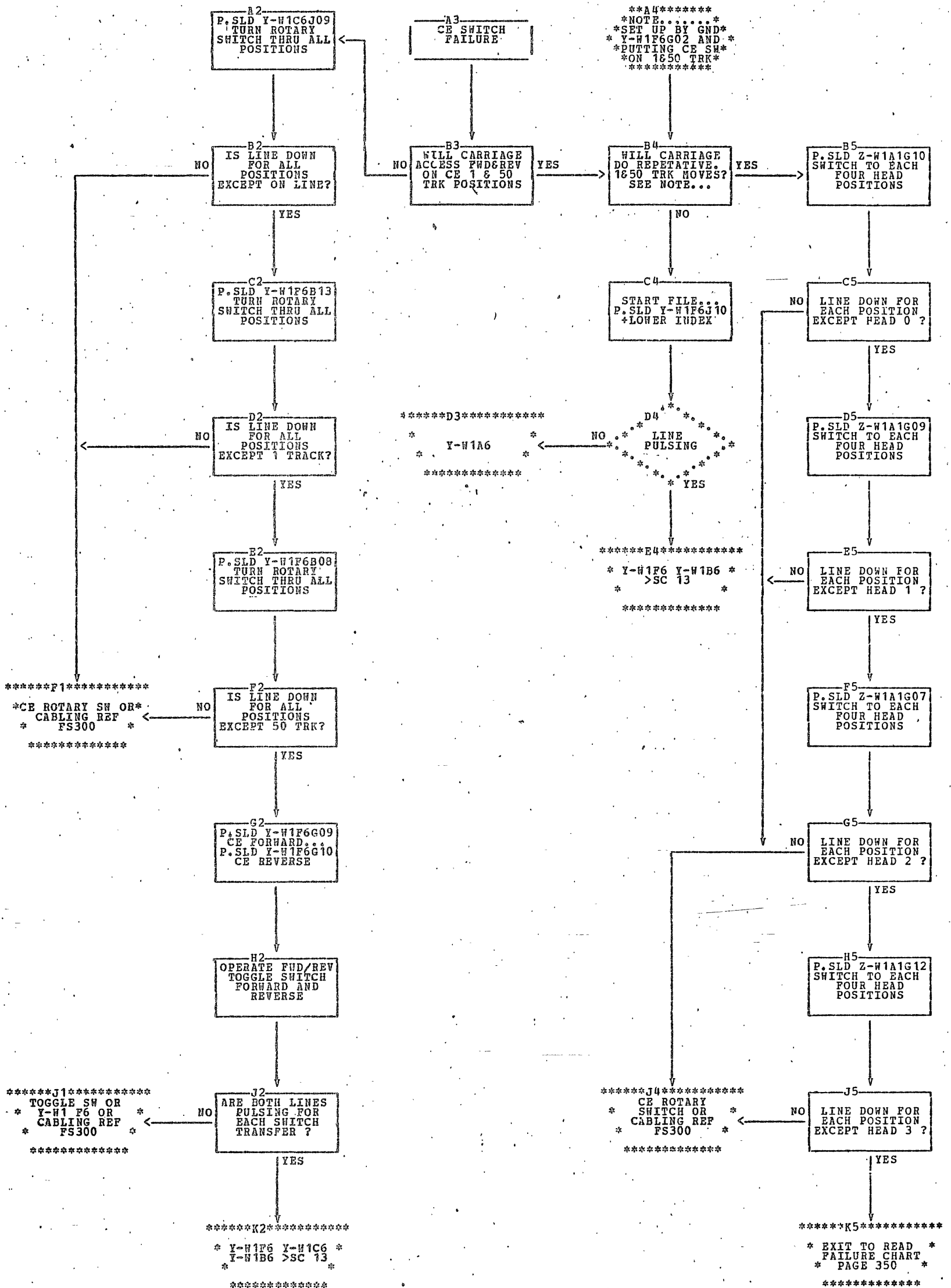






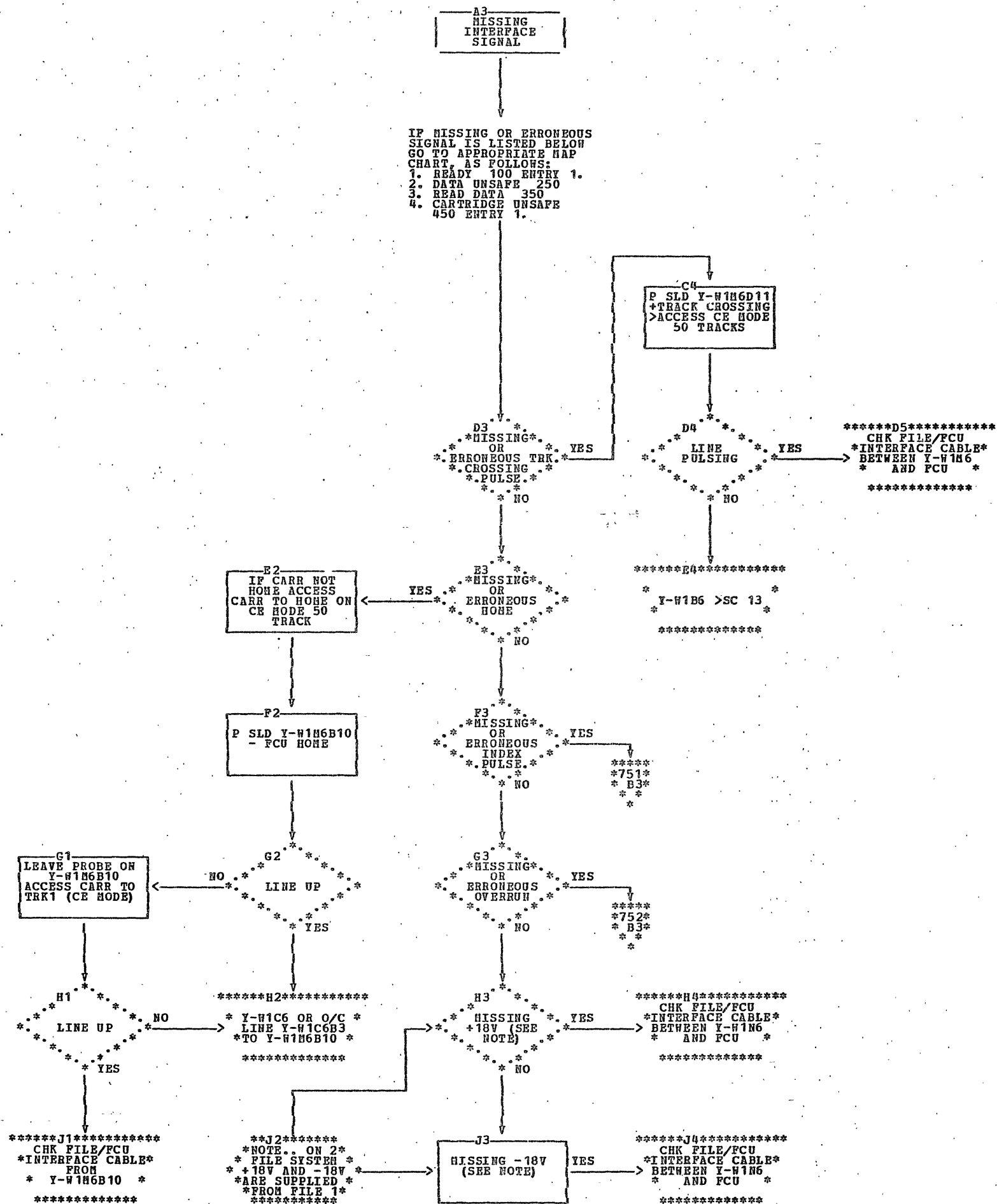


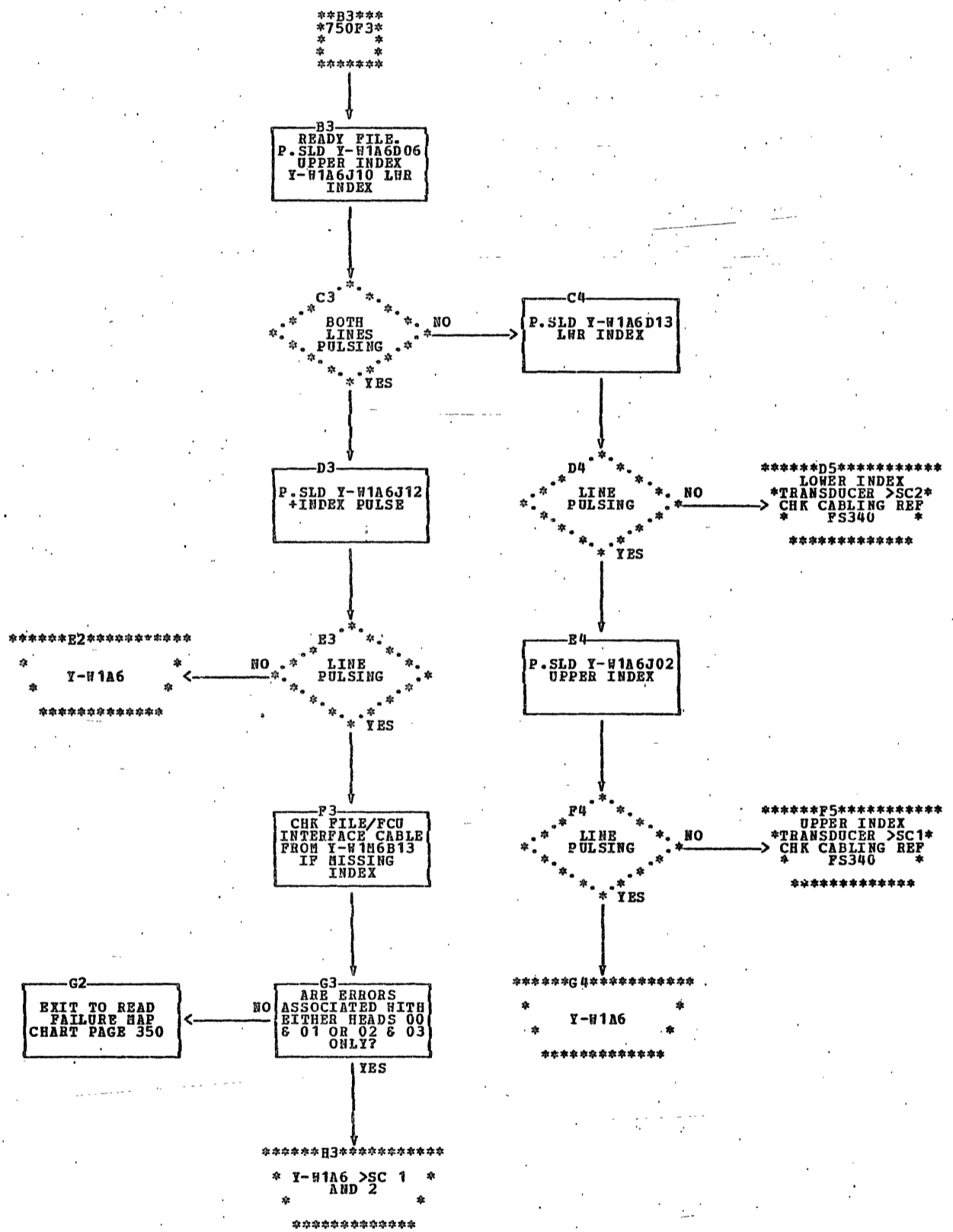


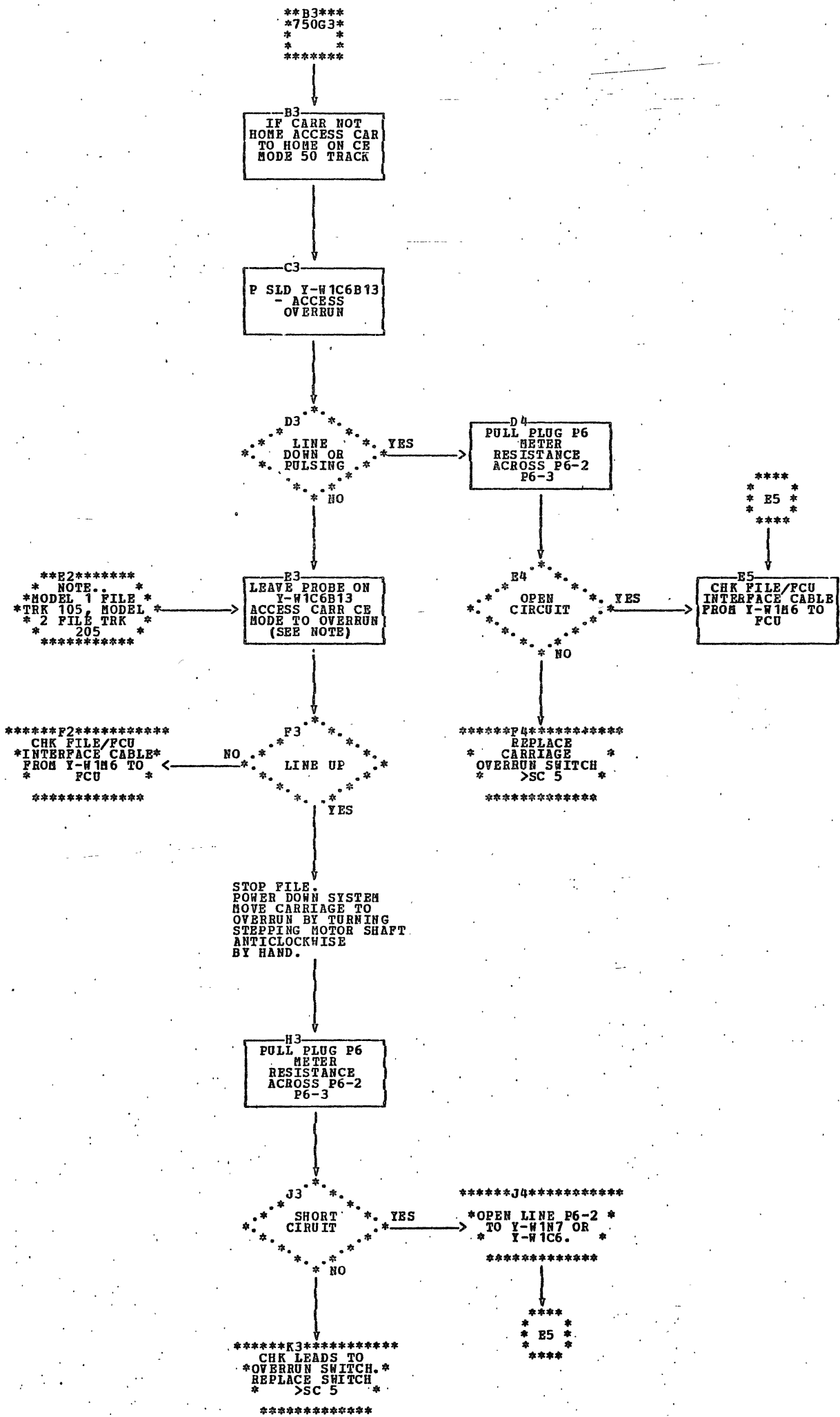


5444 DISK FILE MAP CHARTS
MISSING INTERFACE SIGNAL

PRV EC 392652 PRS EC 392697 PH 2600553 SHEET 1 OF 3







SERVICE CHECKS

PREV EC 392697

PRES EC 392681

PN 2600596

SHEET 01 OF 04

01/12/72

NOTE: SERVICE CHECKS ARE UNDER ENGINEERING CHANGE CONTROL THEREFORE THEY REFLECT THE MOST UP TO DATE AND CORRECT INFORMATION. THE S.C. PROCEDURES HAVE PRIORITY IF ANY DIFFERENCES EXIST BETWEEN S.C. AND FETHM.

S.C. 1. UPPER INDEX TRANSDUCER (REF FETHM 3.5.1.)

FOR QUICK CHECK WITH FILE RUNNING:-
USING THE HST PROBE, PROBE HST Y-W1A6J02. IF LINE IS PULSING OR DOWN REPLACE Y-W1A6 CARD. IF LINE IS NOT DOWN OR PULSING PROCEED WITH THE FOLLOWING ADJUSTMENTS:

(A) RADIAL ADJUSTMENT. OSCILLOSCOPE REQUIRED

- SET THE OSCILLOSCOPE UP AS FOLLOWS:
CONNECT X10 PROBE TO CH1
A SWEEP MODE TO NORM TRIG
LEVEL TO 0 (A TRIGGERING)
SLOPE TO - (A TRIGGERING)
COUPLING TO DC (A TRIGGERING)
SOURCE TO INT (A TRIGGERING)
MODE TO CH1
TRIGGER TO CH1 ONLY
CH1 VOLTS/DIV TO CAL 0.2V
INPUT TO DC (CH1)
A TIME/DIV TO CAL 0.5MS
CH2 VOLTS/DIV TO CAL 0.2
- IF AVAILABLE SELECT A DISK PACK WITH A .080 INCH WIDE SENSE SLOT IN THE CARTRIDGE ARMATURE PLATE (SEE STEP 4) OTHERWISE USE ONE WITH A .040 INCH SLOT.
- START THE FILE AND DISPLAY UPPER INDEX PULSE ON PIN Y-W1A6J02.
- CHECK THAT WAVEFORM HAS A PEAK OF
A. -2.5V TO -10V IF USING A DISK PACK WITH .080 (2.032MM) SLOT.
B. -1.5V TO -8.0V IF USING A DISK PACK WITH .040 (1.016MM) SLOT.
- IF OUTPUT IS OUTSIDE LIMITS STATED IN STEP 4, STOP FILE AND REMOVE CARTRIDGE. SLACKEN 4 SCREWS HOLDING THE UPPER INDEX TRANSDUCER ASSEMBLY TO INCREASE OUTPUT AND SHIMS IN PAIRS UNDER THE ASSEMBLY. TO DECREASE OUTPUT REMOVE SHIMS IN PAIRS FROM UNDER THE ASSEMBLY. A 0.003 IN SHIM IS APPROXIMATELY EQUAL TO A VOLTAGE DIFFERENCE OF 2 VOLTS.
NOTE: SHIMS MAY HAVE NOTCHES.
2 NOTCHES INDICATE .002 INCH SHIM.
3 NOTCHES INDICATE .003 INCH SHIM.

CAUTION. DO NOT DROP ANY METAL PARTICLES ON TO THE FIXED DISK SURFACE.

- BEFORE RECHECKING THE OUTPUT, CARRY OUT THE MECHANICAL CHECKS STEPS 11 THROUGH 16.
- REPEAT STEPS 5 AND 6 TO OBTAIN LIMITS STATED IN STEP 4. IF THE NEGATIVE PEAK VALUE CANNOT BE OBTAINED REPLACE THE TRANSDUCER. REF FETHM 3.5.2.3
- CHANGE OSCILLOSCOPE SETTING TO
MODE TO CHOP
A TIME/DIV TO CAL 50 MICROSECONDS.
- LEAVE CH 1 PROBE ON Y-W1A6J02. DISPLAY UPPER INDEX PULSE ON CH 2 PROBE PIN Y-W1A6 D06.
- IF THE POSITIVE GOING EDGE OF THE INDEX PULSE DOES NOT COINCIDE WITH WAVEFORM CROSSOVER POINT CHANGE THE INDEX AMPLIFIER CARD Y-W1A6. LOGIC PAGE FS340 REFERS.
- STOP FILE AND REMOVE THE DISK CARTRIDGE.
- PLACE HUB TOOL P/N 2537550 ON THE SPINDLE WITH THE PROJECTING TIP CLEAR OF TRANSDUCER POLE PIECE LOWER THE HANDLE AND LOCATE THE TOOL FIRMLY.
- ROTATE THE TOOL UNTIL THE TIP OVERLAPS THE TRANSDUCER POLE PIECE. DO NOT HIT IT.
- USING 0.003 INCH FEELER GAGE P/N 2536561, CHECK THAT THE VERTICAL GAP BETWEEN THE TIP OF THE HUB TOOL AND THE POLE PIECE IS NOT LESS THAN 0.003 INCH. DO THIS CHECK AT LEAST TWICE, WITH THE HUB TOOL IN DIFFERENT POSITIONS.
- CHECK THAT THE HORIZONTAL GAP BETWEEN THE POLE PIECE AND THE TIP OF THE HUB TOOL IS 0.007 INCH \pm 0.002 (0.18 MM \pm 0.05 MM). ADJUST BY SLACKENING THE TRANSDUCER MOUNTING SCREWS MOVING THE TRANSDUCER AND TIGHTENING THE SCREWS.
- REMOVE THE HUB TOOL.

(B) CIRCUMFERENTIAL ADJUSTMENT. (REF FETHM 3.5.2.2.) OSCILLOSCOPE REQUIRED.

- LOAD THE CE DISK CARTRIDGE.
- START UP FILE. WAIT FOR FILE TO COME READY
- SET THE CE MODE-SELECT SWITCH TO 1 TRK AND ACCESS THE CARRIAGE TO TRACK 005.
- SET THE CE MODE-SELECT SWITCH TO HDO OR HD1
- SET THE OSCILLOSCOPE UP (USING X1 PROBES) AS FOLLOWS:
A SWEEP MODE TO NORM TRIG
LEVEL TO 0 (A TRIGGERING)
SLOPE TO + (A TRIGGERING)
COUPLING TO AC (A TRIGGERING)
SOURCE TO EXT (A TRIGGERING)
MODE TO ADD
TRIGGER TO NORM
CH1 VOLTS/DIV TO CAL 50MV
CH2 VOLTS/DIV TO CAL 50MV (INVERT)
INPUT TO AC
A TIME/DIV TO 50US
CH1 PROBE TO Y-W1K6J12 (ALD PAGE FS260)
CH2 PROBE TO Y-W1K6J10 (ALD PAGE FS260)
EXT TRIG
INPUT PROBE TO Y-W1A6D06 (ALD PAGE FS340)
- LOOSEN THE CIRCUMFERENTIAL ADJUSTMENT SCREW LOCKNUTS.

- THE OSCILLOSCOPE SHOULD DISPLAY A MARKER PULSE PRECEDING A TRAIN OF PULSES BY 10 MICROSECONDS. THE MARKER PULSE SHOULD OCCUR 30 \pm OR - 5 MICROSECONDS FROM THE START OF THE TRACE. TO ADJUST THE MARKER PULSE, BACK OFF ONE ADJUSTING SCREW AND TIGHTEN THE OTHER. TO PIVOT THE BOOM ABOUT THE CLAMP SCREW, BACKING OFF THE RIGHT SCREW AND TURNING IN ON THE LEFT MOVES THE MARKER PULSE TOWARDS THE START OF THE TRACE, THAT IS, SHORTENS THE DELAY TIME.

- ENSURE THE MARKER PULSE OCCURS AT 30 MICROSECONDS, WITH THE CIRCUMFERENTIAL ADJUSTMENT SCREWS BACKED OFF. THE ADJUSTMENT MAY CHANGE AS SCREWS ARE BACKED OFF.

- OPEN Y LOGIC GATE TO LOCATE A SCREWDRIVER ON THE HEAD OF THE CLAMP SCREWS

- LOOSEN THE CLAMP SCREW ONE HALF TURN AND RETIGHTEN
NOTE: IF THE CLAMP SCREW IS REMOVED OR REPLACED, LIGHTLY LUBRICATE THE SCREW SHANK WITH IBN NO6 OIL

- CHECK THAT THE MARKER PULSE STILL OCCURS WITHIN 25 TO 35 MICROSECS WITH HDO AND HD1 SELECTED IN TURN. IF IT DOES NOT, REPEAT THE ADJUSTMENT FROM STEP 7

- LOCK THE CIRCUMFERENTIAL ADJUSTMENT SCREWS IN THE BACKED OFF POSITION

- CLOSE THE Y GATE.

S.C. 2. LOWER INDEX TRANSDUCER (REF FETHM 3.5.1.2.)

FOR QUICK CHECK WITH FILE RUNNING:-
USING THE HST PROBE, PROBE HST Y-W1A6D07. IF LINE IS PULSING OR DOWN REPLACE Y-W1A6 CARD. IF LINE IS NOT PULSING OR DOWN STOP FILE, CHECK THE GAP BETWEEN THE TRANSDUCER TIP AND THE FACE OF THE SPINDLE PULLEY. IF GREATER THAN 0.001 INCH SLACKEN LOCKNUT AND SET SCREW AND MOVE THE TRANSDUCER ASSEMBLY TOWARDS THE SPINDLE PULLEY. ENSURE THAT THE GAP IS NOT LESS THAN 0.001 INCH AT THE HIGHEST POINT ON THE PULLEY FACE. TIGHTEN SET SCREW AND LOCKNUT, START FILE AND RECHECK WITH HST PROBE Y-W1A6D07. IF LINE IS STILL NOT PULSING OR DOWN PROCEED WITH THE FOLLOWING ADJUSTMENTS:

- SET UP THE OSCILLOSCOPE AS IN SERVICE CHECK 1 (A)
- START THE FILE AND DISPLAY LOWER INDEX PULSE ON PIN Y-W1A6D13.

- CHECK THAT THE WAVEFORM HAS A NEGATIVE PEAK OF -1.5V TO -10V.

- IF THE OUTPUT IS OUTSIDE THE VOLTAGE LIMITS STATED IN STEP 3, STOP FILE, SLACKEN THE LOCK NUT AND SETSCREW AND MOVE TRANSDUCER ASSEMBLY TOWARDS THE SPINDLE PULLEY TO INCREASE OUTPUT OR AWAY TO DECREASE OUTPUT.

- CHECK THAT GAP BETWEEN TRANSDUCER AND THE FACE OF THE SPINDLE PULLEY IS NOT LESS THAN 0.001 INCH AT THE HIGHEST POINT ON THE PULLEY FACE.

- IF THE NEGATIVE PEAK VALUE IS STILL NOT WITHIN THE VOLTAGE LIMITS STATED IN STEP 3 REPLACE THE TRANSDUCER (REF FETHM 3.5.3.3.).

- TIGHTEN SETSCREW AND LOCKNUT (DO NOT OVERTIGHTEN) AND REPEAT STEPS 2 AND 3.

- CHANGE OSCILLOSCOPE SETTING TO
MODE TO CHOP
A TIME/DIV TO CAL

- LEAVE CH1 PROBE ON Y-W1A6D13. DISPLAY LOWER INDEX PULSE ON CH2 PIN Y-W1A6J10 USING X10 PROBE.

- IF THE POSITIVE GOING EDGE OF THE INDEX PULSE DOES NOT COINCIDE WITH THE WAVEFORM CROSSOVER POINT, CHANGE THE INDEX AMPLIFIER CARD Y-W1A6. LOGIC PAGE FS340 REFERS.

S.C. 3. BRUSH MICROSWITCHES (REF FETHM 3.6.2.)

- REMOVE THE FILE COVER.
- UNCLIP AND TAKE OFF THE BRUSH ARM. REMOVE THE COVER PLATE.
- WITH THE CAM ARM ON THE PARKED STOP. CHECK THE GAP BETWEEN THE BODY OF THE SWITCHES AND THE CAM SURFACE. THE CLEARANCE SHOULD BE 0.045 INCH. TO ADJUST, SLACKEN OFF THE PIVOT SCREW AND MOUNTING SCREW, MOVE THE SWITCH, THE NUTS BELOW THE SCREWS ARE CAPTIVE.
- CHECK THE ORDER IN WHICH THE SWITCHES OPERATE, WHEN THE CAM ARM IS MOVING FROM PARKED TO FORWARD STOP. THE CYCLE COMPLETE SWITCH MUST TRANSFER BEFORE THE MIDCYCLE SWITCH. ON RETURN, CAM ARM MOVING FROM FORWARD TO PARKED STOP MIDCYCLE SWITCH MUST TRANSFER BEFORE CYCLE COMPLETE SWITCH THE 0.045 INCH GAP MAYBE EXTENDED \pm OR - 0.005 INCH TO OBTAIN THESE CONDITIONS.

S.C. 4. CARRIAGE RETRACTED SWITCH (REF FETHM 3.10.2.)

- STOP FILE LEAVE SYSTEM POWER ON.
- REMOVE FUSE F1 AND CARRIAGE FLAG ASSEMBLY.
- LOOSEN THE TWO SECURING SCREWS ON SWITCH.
- TURN THE STEPPING MOTOR SHAFT BY HAND TO MOVE CARRIAGE. SET THE SWITCH TO TRANSFER AT TRACK MINUS 118 (TRACK 32 ON ENCODER DISK) \pm OR - 1/2 A TRACK TO BE READ OFF THE ENCODER DISK WHEN MOVING CARRIAGE TOWARDS RETRACTED LIMIT OF TRAVEL.

NOTE. ENSURE THAT THE MICROSWITCH TRANSFERS ON CHAMFER OF STRIKER BRACKET.

- TIGHTEN THE MICROSWITCH SECURING SCREWS.
- REPLACE CARRIAGE FLAG ASSEMBLY AND FUSE F1.

SERVICE CHECKS

PREV EC 392697

PRES EC 392681

PN 2600596

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S.C. 5. CARRIAGE OVERRUN SWITCH (REF FETHM 3.10.2)

1. START FILE.
2. LOOSEN THE TWO SECURING SCREWS ON SWITCH.
3. SET THE SWITCH TO TRANSFER AT TRACK 204 (TRACK 4 ON ENCODER DISK) + OR - 1/2 A TRACK WHEN ACCESSING CARRIAGE IN CE MODE TOWARDS INNER LIMIT OF TRAVEL. FINE ADJUSTMENT CAN BE MADE BY ADJUSTING THE STRIKER BRACKET.

NOTE. ENSURE THAT THE MICROSWITCH TRANSFERS ON CHAMFER OF STRIKER BRACKET.

4. TIGHTEN SECURING SCREWS.

NOTE. FOR A MODEL 1 FILE THE SWITCH IS REVERSED. SET THE SWITCH TO TRANSFER AT TRACK 104 + OR - 1/2 A TRACK.

S.C. 6. HEAD LOAD MECHANISM (REF FETHM 3.9.1.)

1. WITH THE SYSTEM POWER OFF REMOVE STEPPING MOTOR PLUG P3 FROM SOCKET J3.
2. REMOVE FILE TOP COVER AND ENCODER DISK COVER.

NOTE: CHECK THAT THE HEAD LOAD SHAFT SPRINGS ARE CORRECTLY SEATED ON THE HEAD DIMPLE. ALSO CHECK THAT THE HEAD LOAD ARM IS SECURE ON THE HEAD LOAD SHAFT (REFS FETHM 3.8.2. AND 3.9.). IF NOT CARRY OUT S.C. 8 BEFORE S.C. 6.

3. CHECK THAT THE CAN HOLD MAGNET IS AGAINST THE CAN HOLD LEVER AND ENSURE THE TWO POLES OF THE MAGNET ARE IN CONTACT WITH THE LEVER.

4. ADD JUMPER FROM Y-W1F6B07 TO GROUND.
5. SWITCH ON SYSTEM POWER THEN FILE START.

NOTE. THE BRUSH MOTOR WILL NOW CYCLE CONTINUOUSLY. THIS ALLOWS THE CAN HOLD MAGNET TO BE ENERGISED.

6. MANUALLY ACCESS THE CARRIAGE TO TRACK 100 BY TURNING STEPPING MOTOR SHAFT COUNTER CLOCKWISE.
7. LOOSEN THE TWO SECURING SCREWS OF THE LEVER HOLD MAGNET AND MOVE THE MAGNET AWAY FROM THE LATCH LEVER.

8. HOLD THE LATCH LEVER IN ITS PRESENT POSITION.

NOTE: HOLD THE LATCH LEVER FIRMLY BUT DO NOT OVERCOME THE RESISTANCE OF THE HEADS BY PRESSING TOO HARD ON THE LATCH LEVER AS THIS WILL OVERLOAD THE HEADS AND PUSH THEM ONTO THE DISKS.

9. PRESS THE LEVER HOLD MAGNET AGAINST THE LATCH LEVER ENSURING THAT THE TWO POLES OF THE MAGNET ARE IN CONTACT WITH THE LEVER AND LOCK SECURING SCREWS.

10. SLACKEN OFF THE HEAD LOAD MICROSWITCH LOCKING SCREWS.

11. MOVE THE CARRIAGE TO TRACK 000 BY TURNING STEPPING MOTOR SHAFT.

12. CARRY OUT STEPS 7 THROUGH 9 OF S.C. 7.

13. MOVE THE CARRIAGE TO TRACK 100 TO ENSURE THAT THE HEAD LOAD LEVER IS IN CONTACT WITH THE HEAD LOAD SOLENOID POLE PIECES.

14. REMOVE THE JUMPER FROM Y-W1F6B07 AND WAIT UNTIL BRUSH ARM IS IN THE PARKED POSITION AND THE CAN HOLD SOLENOID HAS DE-ENERGISED. CHECK THAT A 200 GRAIN FORCE APPLIED TO THE HEAD LOAD LEVER DOES NOT CAUSE THE HEAD LOAD LEVER TO BE FORCED AWAY FROM THE HEAD LOAD SOLENOID POLE PIECES. REPEAT ADJUSTMENT FROM STEP 6 IF HEAD LOAD LEVER IS FORCED AWAY FROM THE HEAD LOAD SOLENOID.

15. STOP THE FILE. MOVE CARRIAGE TO THE FULLY RETRACTED POSITION.

16. RECONNECT PLUG P3 TO SOCKET J3. REFIT THE TOP COVER AND ENCODER DISK COVER.

S.C. 7. LEVER HOLD INLK MICROSWITCH (REF FETHM 3.9.5.)

1. WITH THE SYSTEM POWER OFF REMOVE STEPPING MOTOR PLUG P3 FROM SOCKET J3.

2. REMOVE FILE TOP COVER AND ENCODER DISK COVER.

3. ADD JUMPER FROM Y-W1F6B07 TO GROUND.

4. MOVE CARRIAGE FORWARD BY ROTATING THE STEPPING MOTOR SHAFT COUNTER CLOCKWISE TO ALLOW ACCESS TO HEAD LOAD MICROSWITCH LOCKING SCREWS

5. SLACKEN THE HEAD LOAD MICROSWITCH LOCKING SCREWS. THE ADJUSTING PLATE IS NOW FREE TO MOVE. MOVE CARRIAGE TO THE FULLY RETRACTED POSITION.

6. SWITCH ON SYSTEM POWER AND START FILE.

NOTE: THE BRUSH MOTOR WILL NOW CYCLE CONTINUOUSLY, ENABLING THE CAN HOLD MAGNET TO BE ENERGISED AFTER THE BRUSH MOTOR HAS COMPLETED THE FIRST FORWARD CYCLE.

7. MOVE THE CARRIAGE TOWARDS TRACK 100 BY ROTATING THE STEPPING MOTOR SHAFT COUNTER CLOCKWISE UNTIL THERE IS A GAP OF 0.020 INCH BETWEEN THE HEAD LOAD LEVER AND THE UPPER POLE PIECE OF THE HEAD LOAD MAGNET.

NOTE: THIS CONDITION SHOULD BE OBTAINED BETWEEN TRACKS 60 AND 70.

8. ADJUST THE HEAD LOAD MICROSWITCH SO THAT IT JUST OPERATES. TIGHTEN THE LOCKING SCREWS AND CHECK THAT THE MICROSWITCH IS STILL IN THE OPERATED POSITION.

NOTE: FOR A VISUAL INDICATION OF WHEN THE SWITCH IS OPERATED, CONNECT A CE PROBE (SLD) TO PIN Y-W1C6603. WHEN THE SWITCH IS OPERATED, THE PROBE INDICATES "LINE UP".

9. MOVE CARRIAGE BACK TO TRACK 000 AND THEN FORWARD TOWARDS TRACK 100 UNTIL THERE IS A GAP OF 0.30 INCH BETWEEN THE HEAD LOAD LEVER AND THE UPPER POLE PIECE OF THE HEAD LOAD MAGNET. CHECK THAT THE MICROSWITCH HAS NOT OPERATED. REPEAT STEPS 7 AND 8 IF MICROSWITCH HAS OPERATED.

NOTE: STEP 9 IS NEEDED TO CHECK THAT THE MICROSWITCH LEVER HAS BEEN SET UP WITHOUT EXCESSIVE OVERTRAVEL.

10. RETURN THE CARRIAGE TO TRACK 000.

11. REMOVE THE JUMPER FROM Y-W1F6B07 AND WAIT UNTIL THE BRUSH ARM IS IN THE PARKED POSITION.

12. STOP THE FILE AND POWER DOWN SYSTEM.

13. RETURN CARRIAGE TO THE RETRACTED POSITION.

14. RECONNECT PLUG P3 TO SOCKET J3.

15. REFIT TOP COVER AND ENCODER DISK COVER.

S.C. 8. HEAD LOAD SPRING SHAFTS (REF FETHM 3.9.9)

TO CHECK THE HEAD LOAD SHAFT SPRINGS, CARRY OUT STEPS 1 TO 20 WITHOUT LOOSENING THE CLAMP SCREWS.

1. IF DATA HAS TO BE RETAINED ALL ATTEMPTS SHOULD BE MADE TO TRANSFER TO A SCRATCH DISK PACK.

2. WITH SYSTEM POWER OFF REMOVE FILE TOP COVER.

3. WITH CARRIAGE IN THE FULLY RETRACTED POSITION REMOVE HEAD ARM ASSEMBLIES. REF FETHM 3.8.2.4.

4. REMOVE HEAD LOAD MICROSWITCH ASSEMBLY.

5. REMOVE CABLE CLAMP PILLAR, LOCATE THE DISK CLEARANCE AND HEAD LOAD SPRING GAGE (P/N 2600555) ON THE HOLE IN THE MACHINE PAD, SECURING THE GAGE WITH THE CAPTIVE SCREW.

NOTE. IF HEAD LOAD SPRING GAGE P/N 5144375 IS BEING USED REFER TO FETHM 3.9.9.2.

6. REMOVE PLASTIC TRANSISTOR COVER.

7. SET THE LINKS IN ORDER 03, 02, 01 AND 00. 03 IS THE MASTER SHAFT WHICH CARRIES THE HEAD LOAD LEVER.

8. LOOSEN THE HEAD LOAD LEVER CLAMP SCREW, WITH THE HEAD LOAD LEVER IN THE UNLOADED POSITION, TOUCHING THE CARRIAGE SURFACE CENTRALLY POSITIONED IN THE RECESS OF THE CARRIAGE CASTING, THE HEAD LOAD SPRING 03 SHOULD CLEAR THE 03 GAGE SURFACE BY .006 TO .014 INCH. ENSURE THAT THE SHAFT SHOULDER IS BEARING ON THE BUSH. TIGHTEN THE HEAD LOAD ARM SCREW TO 8LB/IN TORQUE AND RECHECK THE SPRING TO 03 GAGE SURFACE CLEARANCE.

CAUTION. ENSURE THE HEAD LOAD SPRINGS ARE CLEAR OF THE FIXED DISK WHEN CARRIAGE IS MOVED.

9. WITH THE HEAD LOAD LEVER TOUCHING THE CARRIAGE CASTING, MOVE CARRIAGE TO TRACK 100.

10. STILL KEEPING THE CONDITION IN STEP 8, LOOSEN THE 03 LINK SOCKET SCREW, SET LINK 03 VERTICAL AND TIGHTEN THE SCREW TO 8 LB IN TORQUE. ENSURE THE END PLAY OF THE SHAFTS DOES NOT EXCEED 0.003 INCH.

11. MOVE GAGE ARM 03 BACK AND PROCEED WITH 02. LOOSEN LINK 02 SOCKET SCREW, RETRACT THE CARRIAGE TO APPROXIMATELY TRACK MINUS 70. SET THE 02 HEAD LOAD SPRING .006 INCH TO .014 INCH ABOVE THE 02 GAGE SURFACE AND ADJUST THE LINK TO TOUCH THE SLOT OF THE 03 LINK. LIGHTLY TIGHTEN THE 02 LINK SOCKET SCREW. MOVE THE CARRIAGE TO TRACK 100 AND TIGHTEN SOCKET SCREW TO 8LB/IN TORQUE.

NOTE. ADJUST ALL HEAD LOAD SPRINGS WHETHER BLANK ARMS ARE FITTED IN LOWER POSITIONS OR NOT.

12. MOVE CARRIAGE TO APPROXIMATELY TRACK MINUS 70, CHECK THAT THE 02 HEAD LOAD SPRING CLEARS THE 02 GAGE SURFACE BY .006 INCH TO .014 INCH.

13. MOVE THE GAGE ARM 02 BACK AND PROCEED WITH 01, LOOSEN LINK 01 SOCKET SCREW, SET THE 01 HEAD LOAD SPRING .006 INCH TO .014 INCH ABOVE THE 01 GAGE SURFACE AND ADJUST THE LINK TO TOUCH THE SLOT OF THE 02 LINK. LIGHTLY TIGHTEN THE 01 LINK SOCKET SCREW. MOVE THE CARRIAGE TO TRACK 100 AND RETIGHTEN SOCKET SCREW TO 8 LB IN TORQUE.

14. MOVE CARRIAGE TO APPROXIMATELY TRACK MINUS 70, CHECK THAT THE 01 HEAD LOAD SPRING CLEARS THE 01 GAGE SURFACE BY .006 INCH TO .014 INCH.

15. MOVE 01 GAGE ARM BACK AND PROCEED WITH SHAFT 00, ADJUST AS FOR PREVIOUS SHAFTS MAKING SURE THE LINK TOUCHES THE 01 LINK ON THE CORRECT SIDE.

CAUTION. NOTE THAT EACH LINK IS DEPENDENT UPON THE OTHER SO ALL LINKS MUST BE CHECKED WHEN ANY ONE IS ADJUSTED.

16. REPLACE MICROSWITCH ASSEMBLY AND ADJUST TO SC 7.

17. REPLACE HEADS AND CHECK THAT THE HEAD LOAD SHAFT SPRINGS ARE SEATED CORRECTLY ON HEAD DIMPLE. (REF FETHM 3.8.2.5.) ADJUST HEADS AS PER FETHM 3.8.2.3

CAUTION. ENSURE THAT THE FIRING IN THE AREA OF MICROSWITCHES AND CARRIAGE PHOTO CELLS DOES NOT FOUL THE CARRIAGE FLAG WHEN CARRIAGE IS MOVED OVER FULL RANGE OF TRAVEL.

18. REPLACE TRANSISTOR COVER.

19. ENSURE HEAD KNOCK OFF SETTING IS CORRECT TO SC 9.

20. IF DATA IS STILL TO BE RECOVERED FROM FIXED DISK REFER TO ERP CHART FETHM 2.2.

21. REINITIALISE THE FIXED DISK

22. REPLACE CUSTOMER DATA IF REQUIRED.

SERVICE CHECKS

01/12/72

PREV EC 392697

PRES EC 392681

PN 2600596

SHEET 03 OF 04

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S.C. 9. HEAD KNOCK OFF BRACKET (REF FETHM 3.9.2.)

1. SWITCH ON FILE START
 2. WITH CARRIAGE AT TRACK 000 AND FILE READY, CONNECT A JUMPER FROM PIN Y-W1C6D02 TO GROUND. (TO PERMIT CARRIAGE MOVEMENT BEHIND TRACK 000).
 3. SET THE CE MODE-SELECT SWITCH TO 1TRK.
 4. ACCESS THE CARRIAGE FORWARD ONE TRACK TO RESET THE 'INHIBIT RETRACT' LATCH.
- CAUTION: IN THE NEXT STEP, DO NOT ACCESS THE CARRIAGE PAST TRACK -008. IF THE HEADS UNLOAD, REMOVE THE JUMPER AND RESTART AT STEP 1.
5. ADJUST KNOCK OFF BRACKET TO OPERATE LATCH LEVER BETWEEN TRACKS -005 AND -007.
 6. ACCESS FORWARD TO TRACK 000
 7. REMOVE THE JUMPER.

S.C. 10. CARTRIDGE INTERLOCK SWITCHES (REF FETHM 3.4.4.)

EACH CLAMP ARM ASSEMBLY CONTAINS AN INTERLOCK MICROSWITCH.

NOTE: SOME FILES HAVE SWITCH ON ONE ARM ASSEMBLY ONLY

1. OPEN THE CLAMP ARMS AND REMOVE THE DISK CARTRIDGE
 2. DETACH THE ARMS. (3 SOCKET SCREWS PER ARM).
- DANGER. THE TOGGLE SPRING ASSEMBLY UNDER EACH ARM IS UNDER TENSION. KEEP FINGERS CLEAR WHEN LIFTING, IN THE FOLLOWING STEPS
3. IN TURN, LIFT THE TOGGLE SPRING ASSEMBLY FOR EACH ARM AND FEEL THE FREE PLAY OF 1/16 INCH APPROX.
 4. PLACE A 0.005 FEELER GAGE BETWEEN THE UPPER PLATE AND SWITCH PLUNGER.
 5. LIFT UP THE ASSEMBLY ENSURING THAT THE SLOT ABOVE THE UPPER PLATE BOTTOMS ON THE NYLON BUSHING.
 6. POSITION THE SWITCH AGAINST THE UPPER PLATE WITH THE 0.005 FEELER GAGE INSERTED AND THE SWITCH FULLY DEPRESSED.
 7. REMOVE FEELER GAGE AND TIGHTEN SWITCH MOUNTING SCREWS.
 8. MAKE SURE THAT THE SWITCH TRANSFERS IN BOTH DIRECTIONS AND REFIT THE CLAMP ARMS.

S.C. 11. CARRIAGE FLAG ADJUSTMENT (REF FETHM 3.10.5.)

1. INSPECT BULBS FOR DISCOLORATION AND FOCUS. REPLACE IF NECESSARY
 2. LOOSEN THE TWO LOCKING SCREWS AND POSITION THE FLAG SUCH THAT IT RUNS MIDWAY BETWEEN THE PHOTOCCELL ON THE PC BOARD AND THE LAMP HOLDER.
- NOTE. THE FLAG SHOULD NOT TOUCH EITHER THE PHOTOCCELL OR THE LAMP WHEN THE CARRIAGE IS ACCESSED OVER ITS COMPLETE RANGE.
3. ACCESS THE CARRIAGE TO TRACK 170/92 IF MODEL 1 OR MODEL A01) BY USE OF THE CE SWITCH.
 4. PROBE SLID Y-W1C6G07. (B6G05 IF MODEL 1 OR MODEL A01) POSITION THE FLAG UNTIL LINE CHANGES FROM ACTIVE (UP LEVEL) TO INACTIVE (DOWN LEVEL).
 5. TIGHTEN THE FLAG RETAINING SCREWS AND CARRY OUT THE FOLLOWING CHECKS.
 6. POSITION CARRIAGE AT TRACK 169 (96 MODEL 1 OR MODEL A01) AND CHECK FOR A 'DOWN' LEVEL.
 7. POSITION CARRIAGE AT TRACK 171 (88 MODEL 1 OR MODEL A01) AND CHECK FOR AN 'UP' LEVEL.

S.C. 12. ENCODER ADJUSTMENTS (REF FETHM 3.7.6.4.)

1. STOP THE FILE AND POWER DOWN THE SYSTEM.
 2. REMOVE THE ENCODER COVER AND CHECK THAT THE HORIZONTAL ADJUSTER ON THE LAMP/CELL ASSEMBLY IS APPROXIMATELY AT THE CENTRE POSITION.
- NOTE: THE ENCODER DISK SHOULD BE WIPED CLEAN WITH A LINT FREE TISSUE BEFORE ATTEMPTING ADJUSTMENT. DIRT ON THE DISK COULD INTRODUCE EXTRA PULSES AND UPSET THE MOTOR RUNNING. THE ENCODER DISK SHOULD ALSO BE CLEANED AFTER ANY CHECKING OR ADJUSTMENT. IF THE CELL MOUNTING BLOCK HAS BEEN REMOVED CARE MUST BE TAKEN TO ENSURE THAT THE SLIT IS CLEAN AND UNOBSTRUCTED.
3. SWITCH ON SYSTEM POWER, START FILE AND SET CE MODE SELECT SWITCH TO 50 TRK.
 4. ENSURE FILE IS AT TRACK ZERO AND BRUSH CYCLE IS COMPLETE. SET UP 50 TRACK REPETITIVE ACCESSES BY JUMPERING Y-W1F6G02 TO GROUND.
 5. PLACE A X1 PROBE ON Y-W1B6B12 (+FINE HOBB). SET THE OSCILLOSCOPE AS FOLLOWS:

CH1 VOLTS/DIV	TO 5VOLTS/DIV
MODE	TO CHAN 1
TRIGGER	TO NORM
INPUT	TO DC
A SWEEP MODE	TO NORM
SLOPE	TO - (A TRIGGERING)
COUPLING	TO DC (A TRIGGERING)
SOURCE	TO INT (A TRIGGERING)
HAG	TO OFF
A TIME/DIV	TO 10NS UNCAL.

 ADJUST 'A' VARIABLE SO THAT THE POSITIVE-GOING EDGES OCCUR NEAR THE END OF THE SWEEP. IF ADJUSTMENT IS REQUIRED, THE POSITIVE GOING EDGES WILL APPEAR AT TWO DIFFERENT POSITIONS, INDICATING THAT THE SEEK IS FASTER IN ONE DIRECTION

6. SLACKEN OFF THE LAMP/CELL ASSEMBLY FIXING SCREWS. (REF FETHM 3.7.5.) LEAVE THE SCREWS FINGER TIGHT

7. ADJUST THE HORIZONTAL ADJUSTING SCREW ON THE LAMP/CELL ASSEMBLY BY SMALL AMOUNTS AT A TIME SO THAT THE TWO EDGES COME TOGETHER. A FINE ADJUSTMENT CAN BE OBTAINED USING THE X10 MAGNIFICATION ON THE OSCILLOSCOPE. NOTE THAT THERE IS A LOT OF BACKLASH IN THE ADJUSTING SCREW.

8. TIGHTEN LOCKING SCREWS CAREFULLY, ALTERNATING BETWEEN THE TWO SO AS NOT TO UPSET THE SETTING. REPLACE THE ENCODER COVER.

S.C. 13. MOTOR CONTROL SYSTEM ADJUSTMENTS (REF FETHM 3.7.8)

NOTE. CE OSCILLOSCOPE AND TACHOMETER ASSEMBLY WILL BE REQUIRED FOR THESE ADJUSTMENTS.

13.1. MOTOR SPEED ADJUSTMENT.

1. THE OBJECT OF THE SPEED ADJUSTMENT IS TO ENSURE THAT THE MOTOR RUNS AT A CONSTANT SPEED EQUAL TO THAT REACHED AFTER THE FIRST TRACK OF AN ACCESS.
 2. THIS IS DONE BY OBSERVING THE TIME INTERVAL BETWEEN THE FALL OF THE FINE HOBB NEAR TRACK 1 AND THE ON TRACK PULSE AT TRACK 3 AND EQUALISING THIS TO THE CORRESPONDING TIME INTERVAL AS THE CARRIAGE PASSES TRACK 53 DURING AN ACCESS FROM TRACK 0 TO TRACK 100.
- PERFORM THIS ADJUSTMENT AS FOLLOWS.
3. FILE START MUST BE ON AND THE START UP CYCLE COMPLETE.
 4. MOVE CE SWITCH TO 50TRK POSITION.
 5. SET UP ALTERNATING MOVES BETWEEN TRKS 000 AND 100 BY JUMPERING Y-W1 B6G12 TO B6D13 AND F6G02 TO GROUND
 6. ADD THE FOLLOWING TWO JUMPERS ON Y-W1 BOARD. B6E02 TO B6B13 AND B6D04 TO C6D09. THIS USES AN 'AND' GATE (ON FS260) TO FORM A SIGNAL TO TRIGGER THE SCOPE.
 7. DISPLAY '+ON TRACK', PIN B6 J06 ON 5V/CH. TRIGGER SCOPE WITH THE NEGATIVE EDGE OF THE SIGNAL ON B6B03 AND SET TIMEBASE TO 1NSEC/DIV. WHEN THE TRIGGERING IS CORRECT, TWO TRACES WILL BE SEEN IN RAPID SUCCESSION FOR EACH FORWARD ACCESS FROM TRK 000, SIMILAR TO THAT SHOWN IN FETHM 3.7.8.1.

- CAUTION: IF THE DOUBLE SWEEP CEASES, CHECK THAT THE CARRIAGE IS STILL ACCESSING BETWEEN TRACKS 000 AND 100. IF NOT, REMOVE JUMPERS IN INSTRUCTION 5. AND ACCESS TO TRACK 000, THEN REPLACE JUMPERS TO START AGAIN. IF CARRIAGE WILL NOT RETRACT USING CE SWITCH, GROUND PIN Y-W1C6B13, DO ONE FORWARD ACCESS THEN RETRACT TO TRACK 000. REMOVE C6B13 JUMPER.
8. EXPAND THE TIMEBASE USING THE 'X10' KHOB AND ADJUST THE HORIZONTAL POSITION CONTROL TO DISPLAY THE SECOND PULSE. REFER FETHM 3.7.8.1.
 9. OBSERVE THE TIMING OF PAIRS OF PULSES. THEY SHOULD OCCUR AT IDENTICAL TIMES, WITHIN ONE SMALL DIVISION ON THE SCOPE. IF THEY ARE NOT, ADJUST THE FEEDBACK DELAY POTENTIOMETER (CARD Y-W1B6). AS IN PARAGRAPH 10.
 10. IF THE FIRST PULSE APPEARS TO THE LEFT OF THE SECOND PULSE (MOTOR SPEED TOO SLOW), TURN THE POTENTIOMETER ANTICLOCKWISE, ADJUSTING THE HORIZONTAL POSITION CONTROL ON THE SCOPE TO KEEP THE PULSES ON THE SCREEL AS THE MOTOR SPEED INCREASES. WHEN THE TWO PULSES COINCIDE THE ADJUSTMENT IS CORRECT. IF THE FIRST PULSE APPEARS TO THE RIGHT OF THE SECOND PULSE, THE MOTOR SPEED IS TOO FAST AND THE POTENTIOMETER SHOULD BE TURNED CLOCKWISE.

13.2. LOW SPEED SENSE ADJUSTMENT.

THE LOW-SPEED SENSE ADJUSTMENT IS ONLY REQUIRED ON HIGH SPEED MACHINES (MODELS A01, A02 AND A03).

NOTE. SERVICE CHECK 13.1 MUST BE PERFORMED BEFORE THIS SECTION.

1. ENSURE THAT THE FILE IS SWITCHED ON AND THAT THE START-UP CYCLE IS COMPLETED.
2. USING THE JUMPERS APPLIED IN STEPS 1.5. AND 1.6. ABOVE, SET THE CARRIAGE ALTERNATING BETWEEN TRACKS 000 AND 100.
3. RESET THE OSCILLOSCOPE AS FOLLOWS:

A TIME/DIV	TO 50NANSECS
SOURCE	TO INT (A TRIGGERING)
SLOPE	TO - (A TRIGGERING)
4. DISPLAY 'LOW SPEED DETECT' PULSES FROM Y-W1B6J12. ADJUST 'A' TIME/DIV SO THAT THE AVERAGE PERIOD OCCUPIES 10 DIVISIONS.
5. ADJUST THE LOW SPEED SENSE POTENTIOMETER TO SET THE DOWN LEVEL DURATION TO 6.4 DIVISIONS.

NOTE. IF THE POTENTIOMETER ADJUSTMENT IS A LONG WAY OUT THE PULSES MAY NOT BE SEEN. IN THIS CASE, SET A SWEEP MODE TO AUTO. THEN ADJUST THE POTENTIOMETER UNTIL THE PULSES ARE SEEN. PROCEED WITH THE ADJUSTMENT FROM STEP 3.

6. REMOVE THE JUMPERS, THEN PROCEED TO SERVICE CHECK 13.3.

NOTE: SERVICE CHECKS ARE UNDER ENGINEERING CHANGE CONTROL THEREFORE THEY REFLECT THE MOST UP TO DATE AND CORRECT INFORMATION. THE S.C. PROCEDURES HAVE PRIORITY IF ANY DIFFERENCES EXIST BETWEEN S.C. AND FETHH.

13.3. MULTI-TRACK STOP ADJUSTMENT (REF FETHH 3.7.8.3.)

NOTE: FOR STANDARD SPEED FILES S.C. 13.1 MUST BE PERFORMED PRIOR TO THIS SECTION. FOR HIGH SPEED FILES S.C. 13.1 AND S.C. 13.2 MUST BE PERFORMED PRIOR TO THIS SECTION.

1. REMOVE ENCODER COVER AND ATTACH CE TACHOMETER ASSEMBLY AS SECTION FETHH 3.7.7.
2. DC POWER MUST BE ON THE MACHINE, BUT FILE START MUST BE OFF.
3. ADD THE FOLLOWING JUMPERS
A6G09 - GROUND
A6D12 - GROUND
C6J07 - GROUND
4. MOVE CE SWITCH TO 50 TRACK POSITION, AND ACCESS CARRIAGE TO TRACK + 50 AND THEN TO TRACK 0 BY MEANS OF THE CE TOGGLE SWITCH.

NOTE. IF A CHECK IS REQUIRED, DO ITEMS 10 AND 11, AND THEN PROCEED TO ITEM 15.

5. SET UP ALTERNATE MOVES BETWEEN TRACK 0 AND 50 BY ADDING JUMPER FROM F6G02 AND GROUND.
6. SET SCOPE UP AS FOLLOWS (X10 PROBE CONNECTED TO CHANNEL 1):
TRIGGERING- MODE = 'NORM TRIG', LEVEL = '0',
SLOPE = '+', COUPLING = 'DC', SOURCE = 'INT',
X MODE- MODE = 'CH1', TRIGGER = 'CH1 ONLY',
VOLTS CAL- CH1 = '2V', DC COUPLING,
TIME BASE- TIME DIV A = '100US'.
7. DISPLAY '+ SINGLE SHOT A MULTI' BY PLACING CH1 PROBE ON D6B04. SET DURATION OF POSITIVE PULSE TO 500MICROSECS BY ADJUSTING SINGLE SHOT 'A' MULTI (Y-W1D6 LOWER POT).
8. CHANGE TRIGGERING TO- SLOPE = '-'
CHANGE TIME BASE TO- TIME DIV A = '200US'.
9. DISPLAY - SINGLE SHOT B BY PLACING CH1 PROBE ON D6G09. SET DURATION OF NEGATIVE PULSE TO 1400 US BY ADJUSTING SINGLE SHOT B POT (Y-W1D6 TOP POT).
10. ARRANGE SCOPE AS FOLLOWS (X10 PROBES)
TRIGGERING- MODE = 'NORM TRIG', LEVEL = '0',
SLOPE = '+', COUPLING = 'DC', SOURCE = 'INT',
MODE- TRIGGER = 'CH1 ONLY', MODE = 'CH2',
VOLTS CAL- CH1 = '2V', CH2 = '50MV', DC COUPLING
TIME BASE- TIME DIV A = '5HS',
SET GROUND OF CH2 TO MIDDLE OF THE SCREEN
11. CONNECT CH2 PROBE TO TACHOMETER AND CH1 PROBE TO G7D12.
12. SCOPE WAVEFORM MAY BE SIMILAR TO MALADJUSTED SETTING (REF FETHH SECTION 3.7.8.3.) EXCEPT THAT TRACE COULD BE INVERTED, IF SO, REVERSE LEADS ON TACHOMETER. ADJUST SINGLE SHOT A MULTI TO BRING POSITIVE PEAK AT 10 HS FROM START OF TRACE TO GROUND. ADJUST SINGLE SHOT B TO OBTAIN MINIMUM AMPLITUDE AFTER 12 HS FROM THE START OF THE TRACE.
POSITIVE PEAK MAY BE HIDDEN IF THE SETTLING IS A LONG WAY OUT OF ADJUSTMENT. IN WHICH CASE SET THE TRACE AT 10 HS TO GROUND.
13. REPEAT ITEM 12 UNTIL NO FURTHER IMPROVEMENT CAN BE OBTAINED.
14. REMOVE JUMPER BETWEEN GROUND AND F6G02.
15. CHECK COMPLETE WAVEFORM BY OPERATING CE TOGGLE SWITCH ALTERNATELY FORWARD AND REVERSE, AND ON REVERSE ACCESS CHECK THAT THERE IS NO SETTLING TRANSIENT GREATER THAN + OR - 50 MV AFTER 15 MILLISECONDS FROM START OF WAVEFORM.
16. IF WAVEFORM IS OUT OF TOLERANCE GROUND F6G02 WITH A JUMPER AND PROCEED AGAIN FROM ITEM 12.
17. LEAVING MACHINE IN EXISTING STATE PROCEED TO FETHH SECTION 3.7.8.4. 'SINGLE STOP ADJUSTMENT'.

13.4. SINGLE TRACK STOP ADJUSTMENT (REF FETHH 3.7.8.4.)

NOTE. SERVICE CHECK 13.3. MUST BE PERFORMED BEFORE THIS SECTION.

1. USING CE TOGGLE SWITCH, ACCESS CARRIAGE TO TRACK 0. TURN MODE SWITCH TO '1 TRK' MODE.

NOTE. IF A CHECK ONLY IS REQUIRED PROCEED TO ITEM 6.

2. SET UP ALTERNATE MOVES BETWEEN TRACK 0 AND 1 BY ADDING A JUMPER FROM Y-W1F6G02 TO GROUND.
3. CHANGE TIME BASE OF SCOPE TO 2 HS/DIV
4. ADJUST SINGLE SHOT A SINGLE (Y-W1D6 MIDDLE POT) TO OBTAIN MINIMUM SETTLING (REF FETHH 3.7.8.4.)
5. REMOVE JUMPER Y-W1F6G02 TO GROUND.
6. CHANGE SCOPE TIME BASE BACK TO 5 HS/DIV AND CHECK COMPLETE WAVEFORM BY OPERATING CE TOGGLE SWITCH ALTERNATELY FORWARD AND REVERSE, AND ON REVERSE ACCESS, CHECK THAT THERE IS NO SETTLING TRANSIENT GREATER THAN + OR - 50 MV AFTER 15 MILLISECONDS FROM START OF WAVEFORM.
7. IF WAVEFORM IS OUT OF TOLERANCE GROUND Y-W1F6G02 WITH A JUMPER AND PROCEED AGAIN FROM ITEM 2.

S.C. 14. STEPPING MOTOR SHAFT / LEADSCREW COUPLING (REF FETHH 3.7.3.1.)

NOTE. THESE ADJUSTMENTS REQUIRE THE USE OF THE CE OSCILLOSCOPE.

1. POWER DOWN FILE
 2. ENSURE CARRIAGE IS IN FULLY RETRACTED POSITION.
 3. PUT CE CARTRIDGE ON TO THE FILE.
 4. SWITCH ON FILE START.
 5. WITH MOTOR/LEADSCREW COUPLING LOOSE HOLD THE CARRIAGE MANUALLY SO THAT THE RETRACT MICROSWITCH IS TRANSFERRED UNTIL A BRUSH CYCLE STARTS.
 6. WHEN THE BRUSHES ARE ON THE RETURN STROKE, PUSH CARRIAGE TO TRACK 100 TO LOAD HEADS.
 7. WHEN THE BRUSH CYCLE IS COMPLETED SWITCH TO CE MODE.
 8. ACCESS THE STEPPING MOTOR FOR ONE OR MORE 50 TRACK MOVES. THIS WILL ENSURE THE STEPPER MOTOR IS IN A HOME POSITION.
 9. ACCESS THE STEPPING MOTOR 23 SINGLE TRACK MOVES. THE MOTOR IS NOW DETENTED TO TRACK 73.
 10. WITH THE CE OSCILLOSCOPE CONNECTED AS SHOWN IN FETHH 3.8.2.5 MOVE THE CARRIAGE MANUALLY TO TRACK 73. USE OSCILLOSCOPE TRACE TO MONITOR THE HEAD POSITION.
 11. TIGHTEN THE COUPLING CLAMP SCREW WITH TORQUE WRENCH P/N 2598187 AND ADAPTOR P/N 2597971 (8 LB IN), WHILE RETAINING BOTH THE STEPPING MOTOR AND CARRIAGE AT TRACK 73, ENSURE THAT THE COUPLING ROTATES CLEAR OF THE CASTING.
- NOTE. THE COUPLING SPRING MUST BE ON THE COUPLING WHEN TIGHTENING THE CLAMP SCREW, AND THE PRESSURE PADS MUST BE IN CONTACT.
12. ACCESS THE CARRIAGE FORWARDS AND REVERSE A FEW TIMES USING THE CE SWITCHES.
 13. ACCESS TO TRACK 73 AND CHECK HEAD ALIGNMENT FOR HEADS 00 AND 01.
- NOTE. (A.) IF THE OSCILLOSCOPE TRACE SHOWS THE HEADS TO BE ON OR NEAR TO TRACK 73 GO THROUGH THE PROCEDURE STATED IN FETHH 3.8.2.3. FOR FINAL ADJUSTMENT OF HEADS 00 AND 01.
(B.) IF HEADS ARE NOT NEAR TRACK 73 GO THROUGH THE PROCEDURE FROM STEP 5 ABOVE AGAIN.

S.C. 15. CARRIAGE RE-ENGAGEMENT. (REF FETHH 3.7.9.2.)

1. REMOVE ALL POWER FROM THE FILE.
2. REMOVE TOP COVER.
3. MOVE CARRIAGE MANUALLY FORWARD OR REVERSE, AS REQUIRED, AT THE SAME TIME MANUALLY ROTATE THE STEPPING MOTOR SHAFT ANTICLOCKWISE OR CLOCKWISE RESPECTIVELY UNTIL THE FOLLOWER WHEEL ENGAGES WITH THE LEADSCREW.
4. RELEASE THE CARRIAGE AND CONTINUE TO ROTATE THE MOTOR SHAFT UNTIL THE CARRIAGE IS AT TRACK MINUS 100.
5. REPLACE TOP COVER

S.C. 16. MECHANICAL LIMIT STOP - ADJUSTMENT.

NOTE. IF THE CARRIAGE TRAVELS FARTHER THAN THE NORMAL LIMIT SWITCHES, THE FOLLOWER WHEEL DISENGAGES FROM THE LEADSCREW WITH THE CARRIAGE GOING INTO THE FORWARD CRASH STOP POSITION. IT IS POSSIBLE FOR THE LOWER HEAD (03) TO BE DAMAGED BY HITTING THE DISK HUB. TO PREVENT THIS A MECHANICAL LIMIT STOP HAS BEEN FITTED.

1. UNDO THE HEXAGON HEADED STOP SCREWS HALF A TURN FROM THE FULLY TIGHT POSITION.
2. SLACKEN OFF THE TWO FIXING SCREWS SO THAT THE STOP BRACKET IS FREE TO SLIDE.
3. MOVE THE CARRIAGE GENTLY FORWARD AS FAR AS IT WILL GO.
4. WITH THE STOP SCREW TOUCHING THE CARRIAGE POINTER TIGHTEN THE TWO FIXING SCREWS HOLDING THE STOP BRACKET.
5. TIGHTEN THE HEXAGON HEADED STOP SCREW. THE CARRIAGE POINTER WILL NOW REACH THE STOP SCREW APPROXIMATELY .010 INCH BEFORE THE HEAD MEETS THE HUB.

S.C. 17. ADJUSTMENT OF DASHPOT.

(REF FETHH 3.9.10.3.)

NOTE: THIS SERVICE CHECK CAN ONLY BE PERFORMED ON MACHINES WITH DASHPOT E/C 392669 INSTALLED. CHECK MACHINE HISTORY.

1. FORCE PISTON DOWN BY EXTENDING THE SPRING UNTIL THE PISTON BOTTOMS IN THE POT.
2. CHECK THE DISTANCE FROM THE BOTTOM OF THE SPRING ON THE PISTON TO THE TOP OF THE CAP ON THE DASHPOT ASB. NOTE THIS DIMENSION AS -1- INCHES.
3. RELEASE THE PISTON AND CHECK GAP AS IN STEP 2. NOTE THIS DIMENSION AS -2- INCHES. FOR CORRECT ADJUSTMENT DIMENSION 2 MUST EQUAL DIMENSION 1 PLUS 0.025 INCHES ±0.01 INCHES.

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A2003	SOCKET LISTING	2600513	392667	
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ES220	WRITE CIRCUITS	2600516	392681	
ES230	READ WRITE SAFETY	2600517	392681	
ES240	READ WRITE HGAD SELECTION	2600518	392667	
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ES260	FILTER LMTR & DETECT & TAPS DRVR	2600520	392694	
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A7 5862808 N808

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AD AH AJ AN B1

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B7 5862526 NS26

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N6 CONNECTOR
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B02 FS340BD4
B03 FS320AF4
B07 FS320AB4
B08 FS330CE4
B09 FS410AR4
B10 FS320AG4
B12 FS300AS4
D02 FS410AT4
D04 FS330CC4
D05 FS320AD4
D06 FS320AC4
D07 FS320AE4
D09 FS410AG4
D10 FS410AS4
D11 FS400BC4
D12 FS300AM2
D13 FS300AM6

PLUG LIST

PART NO	ACC	TYPE	SOCKETS	TOTAL
5807870		7870	J6	01
5807872		7872	K6	01
5860178		L178	H6	01
5860182		L182	F6	01
5860189		L189	G7	01
5862513		N513	D6	01
5862514	HSAF	N514	E6	01
5862524		N524	C6	01
5862526		N526	B6	01
5862808		N808	A6	01
		CONN	L6 M6 N7 N6	05

SOCKET LISTING
DATE 01-14-72 PACH 5444STEP

LOG 005 BOARD 50Y-W1
PREV. ENGR. 07-30-71 392694
PRES. ENGR. 12-17-71 392689
P.No. 2600512

IBM CORP. SDD BLK

A1 DOUBLE CARD
A2 5807871 7871
FS240 05 06 07 08 09 10
11 12 13 14 15 16
FS250 17 18 19 20 21 22
23
FS210 24
FS250 25 26 27 28 29 30
31 32 33 34
FS210 A1
FS240 A2 A3 A4 A5 A6

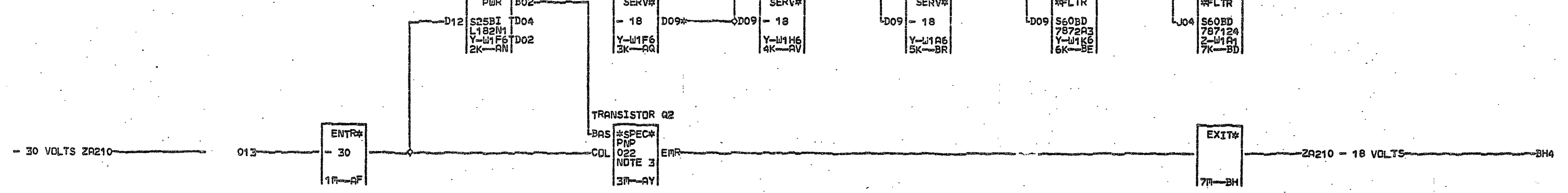
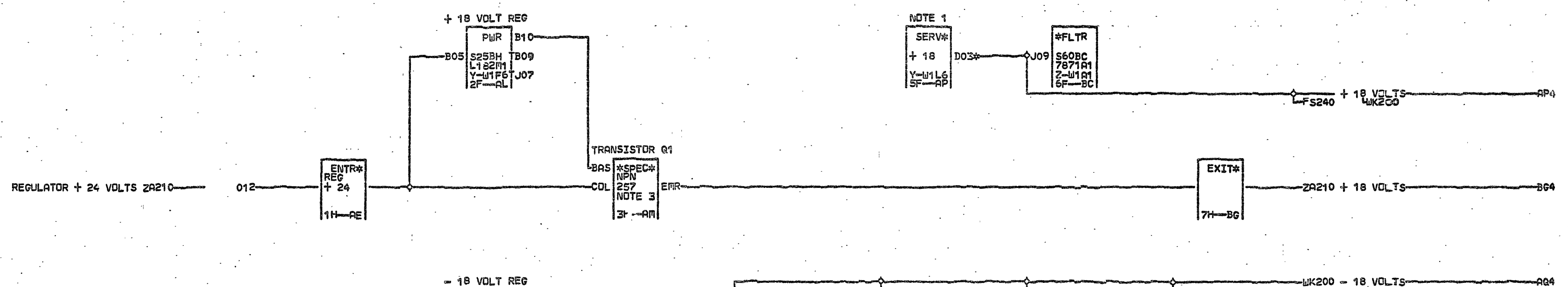
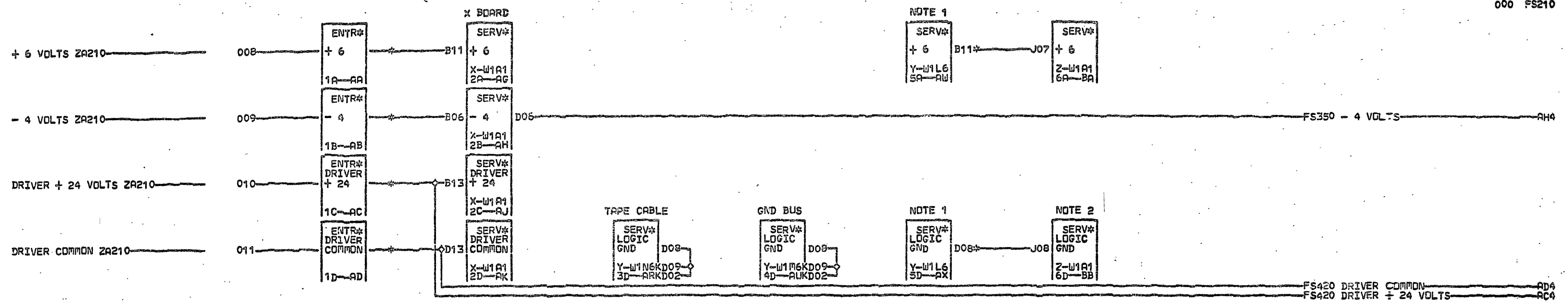
B1 CONNECTOR
B12 FS250BF2
B13 FS250BF6
D13 FS300AB6

B2 CONNECTOR
B02 FS240RE4
B03 FS220AQ2
B04 FS240RH4
B05 FS240BB4
B07 FS300AB8
B08 FS240CA4
B09 FS300AB7
B10 FS240AA4
B12 FS300AB9
B13 FS240AF4
D02 FS240AG4
D04 FS210AG4
D05 FS220BV1
D06 FS220BV3
D07 FS210AW4
D08 FS210AX4
D10 FS240AC4
D11 FS240AD4
D12 FS240AB4
D13 FS240BQ4

PLUG LIST
PART NO ACC TYPE SOCKETS TOTAL
5807871 7871 A1 01
CONN B1 B2 02

SOCKET LISTING
DATE 03-22-71 PACH# 5444STEP
LOG 001 BOARD 502-U1
PREV ENGR# 11-11-70 392652
PRES ENGR# 03-03-71 392667
P#N# 2600513
IBM CORP. SDD BLK.

WOOD

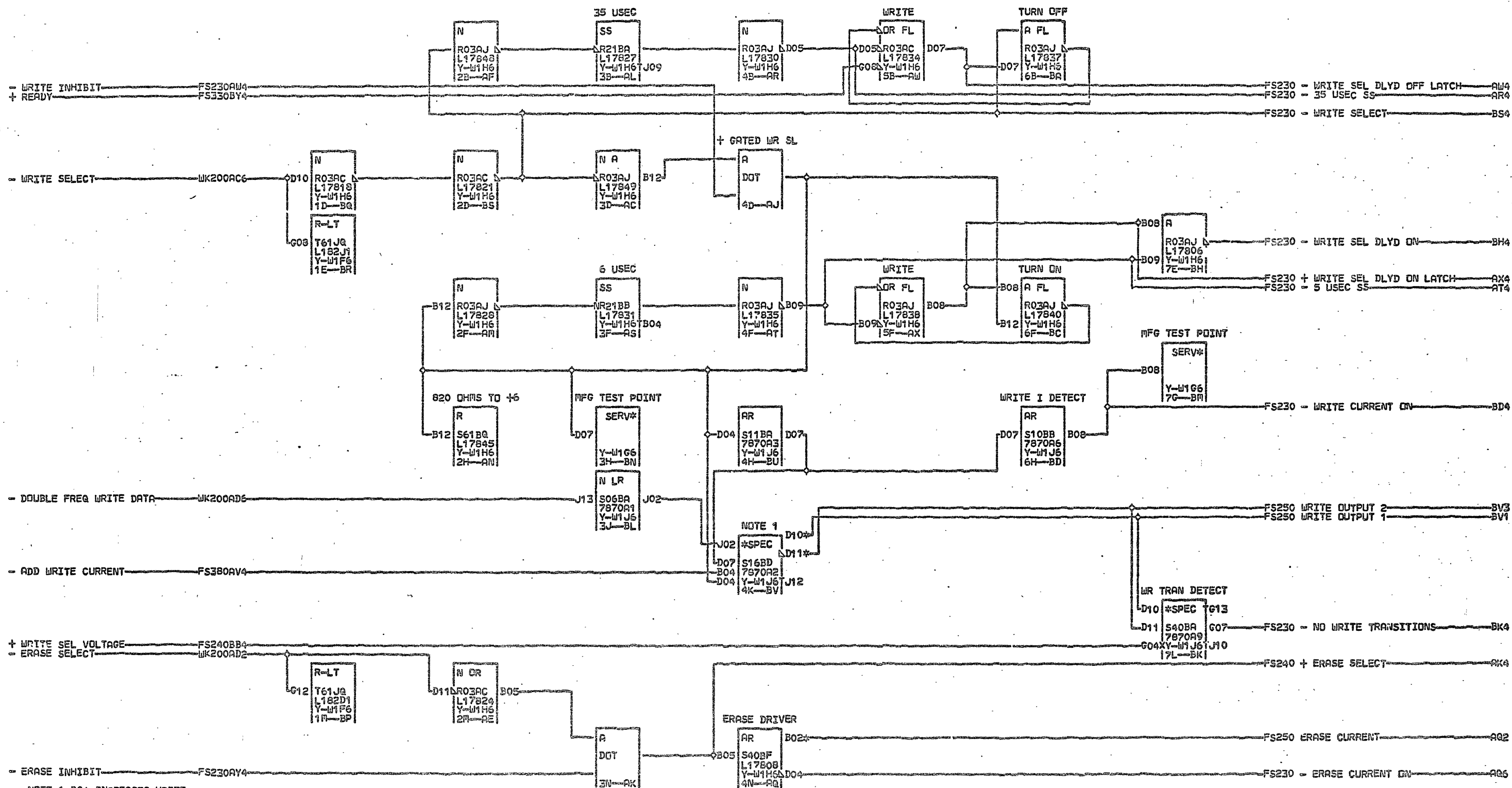


NOTE 1 SEE ZA210 FOR INPUT VOLTAGE BUS TB3 TO LOGIC BOARD WIRING.
 S NOTE 2 THERE IS A JUMPER BETWEEN Z-W1A2D08 AND FRAME
 2 BETWEEN Z-W1A2D08 AND FRAME
 1 NOTE 3 BASE AND COLLECTOR OF DISCRETE TRANSISTORS Q1 AND Q2 ARE WIRED TO Y-GATE VIA OOSLIP-ON CONNECTORS.

AA4 X-W1B1B11 50Z-W1B2D04
 AB4 X-W1B1B06 50Y-W1N5B13
 AC4 X-W1B1B13 AA4 Y-W1L6D07
 AD4 X-W1B1D13 50Z-W1B2D07
 AP4 Y-W1L6D09 AX4 Z-W1B2D08
 50Y-W1N6D04
 50Y-W1N6B03
 AQ4 Y-W1N6D10
 50Y-W1L6D04

05-06-70 392621
 07-07-70 392644
 10-10-70 392649
 11-11-70 392652
 03-03-71 392667

VOLTAGE DISTRIBUTION			
DATE	CS-23-71	MACH	5444STEP
LOG	011	FRAME	50
		PAGE	2300915
IBM CORP.		BLK	BU

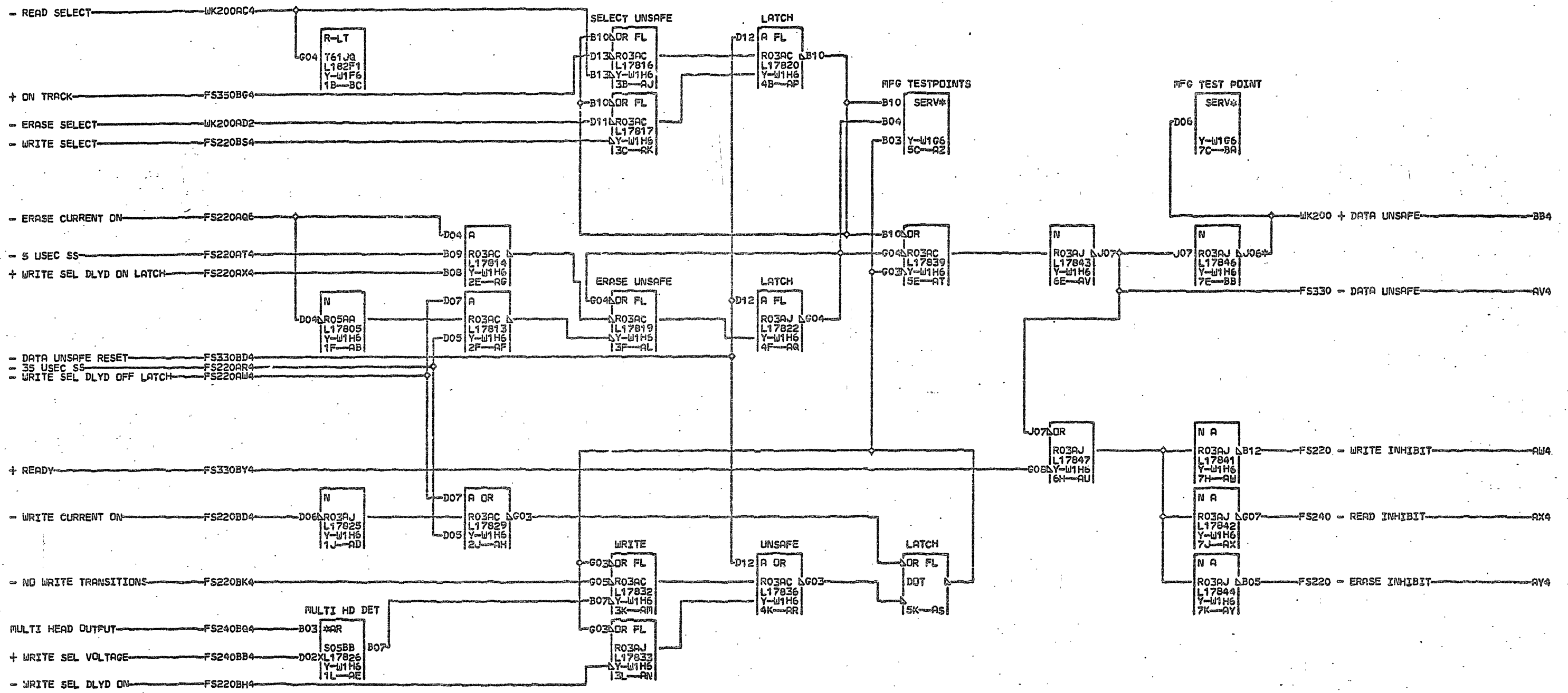


NOTE 1 B04 INCREASES WRITE CURRENT FROM 30 MA TO 35 MA
 NOTE 2 WRITE TRANSITION DETECT
 S CIRCUIT GIVES CONSTANT SLD UP LEVEL WHEN INPUT FREQUENCY ON
 D10 AND D11 GREATER THAN 1.588 MHZ AND 604 AT UP LEVEL

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 03-03-71 392657
 12-17-71 392681

WRITE CIRCUITS			
DATE	00-00-00	RACH	5444STEP
LDC	021	FRAME	50
		P.No	2600516
IBM CORP.		BLK.	BU

FORM 0
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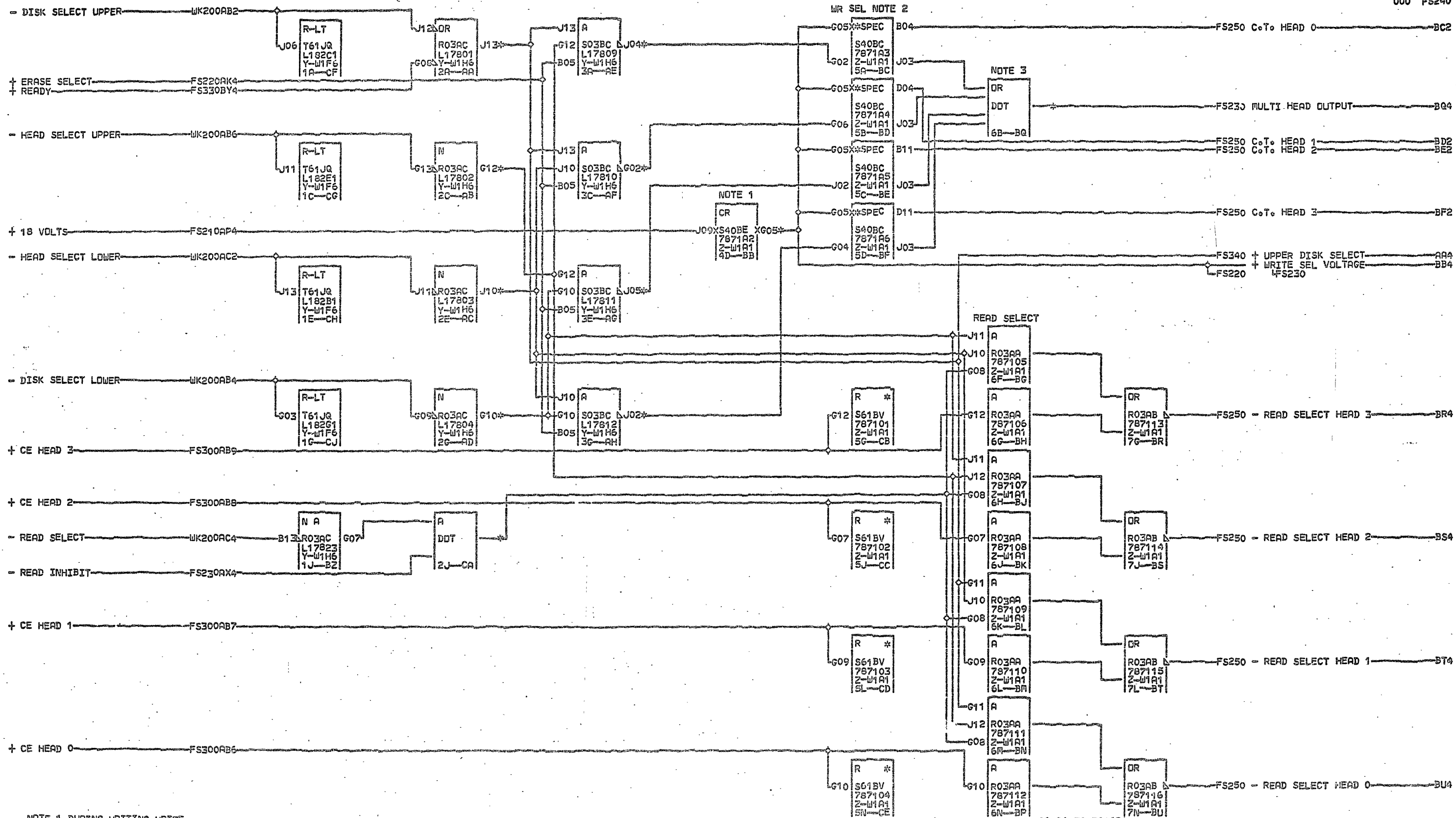
BB4 Y-W1N6B04

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 03-03-71 392667
 12-17-71 392681

READ WRITE SAFETY			
DATE	00-00-00	MACH	5444STEP
LOG	021	FRAME	50
		P.N.	3600317
IBM CORP.		SK.	SD

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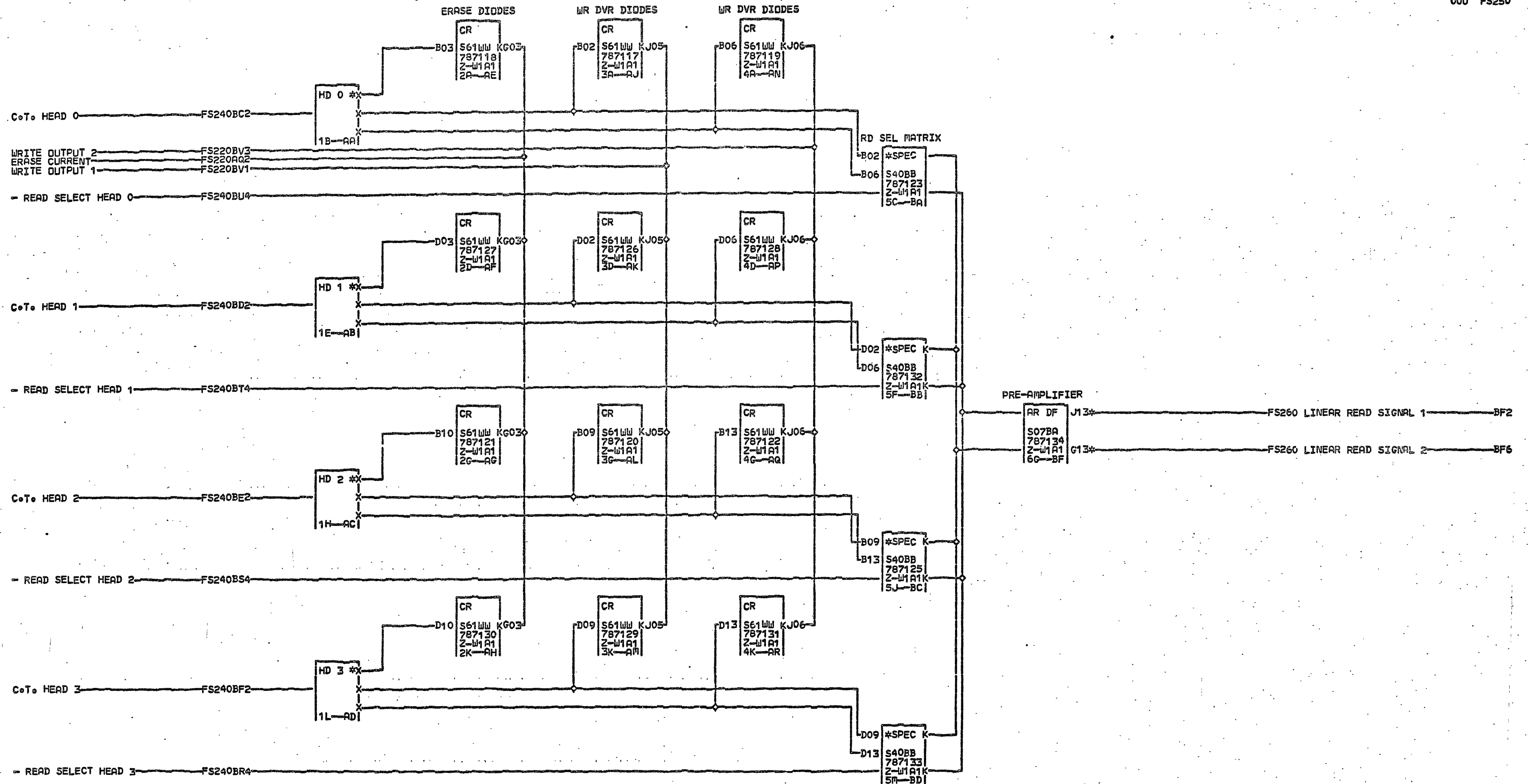


NOTE 1 DURING WRITING WRITE SEL VOLTAGE IS BETWEEN 14.0V AND 16.0V
 F NOTE 2 COT HEAD VOLTS ARE 2 14.0V TO 16.0V WHEN WRITING 4 AND 1.0V TO 1.7V WHEN READING C OTHERWISE STATIC SLD UP LEVEL
 NOTE 3 MULTI HEAD OUTPUT IS 000LESS THAN 6V DURING WRITING N WHEN ONLY ONE HEAD SELECTED

AA4 Y-W1L6B10	502-W1B2B02	BQ4 Y-W1L5D13
502-W1B2B10	AF4 Y-W1L5B13	502-W1B2D13
AB4 Y-W1L6D12	502-W1B2B13	CA4 Y-W1L5B08
502-W1B2D12	AC4 Y-W1L5D02	502-W1B2B09
AC4 Y-W1L6D10	502-W1B2D02	
502-W1B2D10	AA4 Y-W1L6B04	
AD4 Y-W1L6D11	502-W1B2B04	
502-W1B2D11	BB4 Z-W1B2B05	
AE4 Y-W1L6B02	50Y-W1L6B05	

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 02-02-71 392667

READ WRITE HEAD SELECTION		
DATE	03-23-71	MOCH. 5444STEP
LDG	012	FRAME 50
		P.No 2600518
IBM CORP.	BLK.	CK



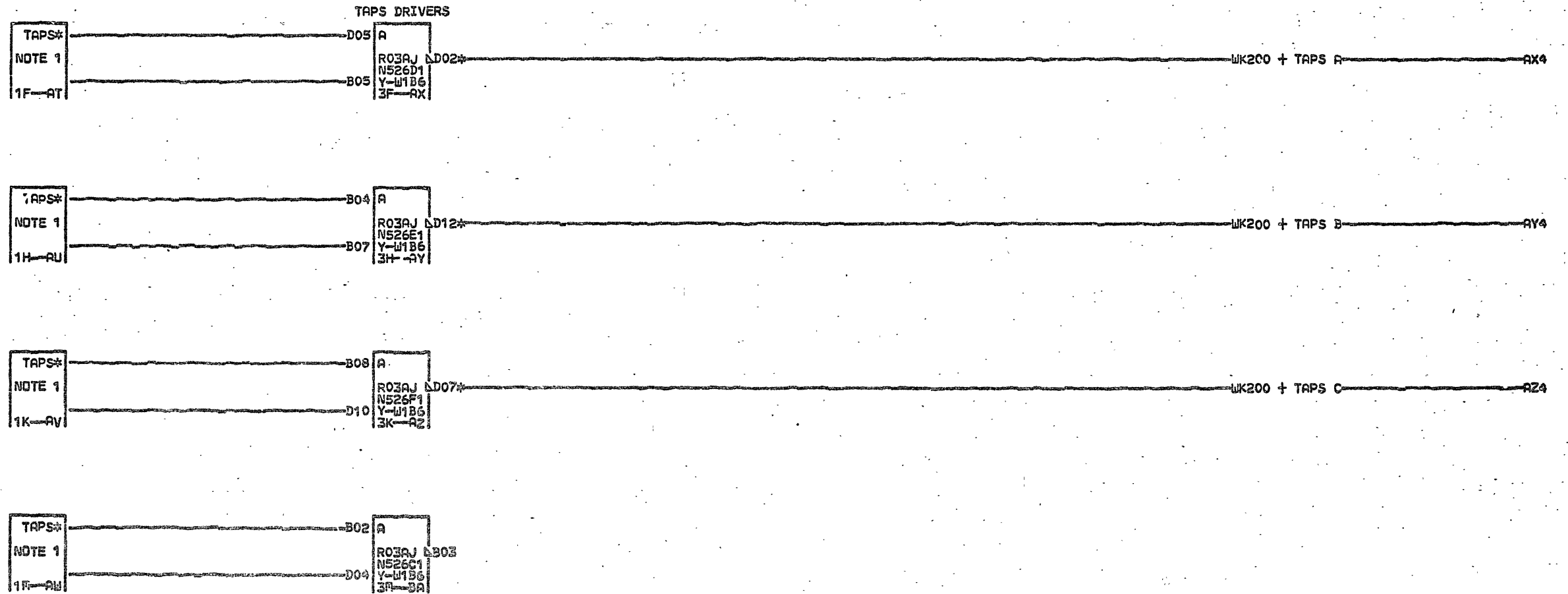
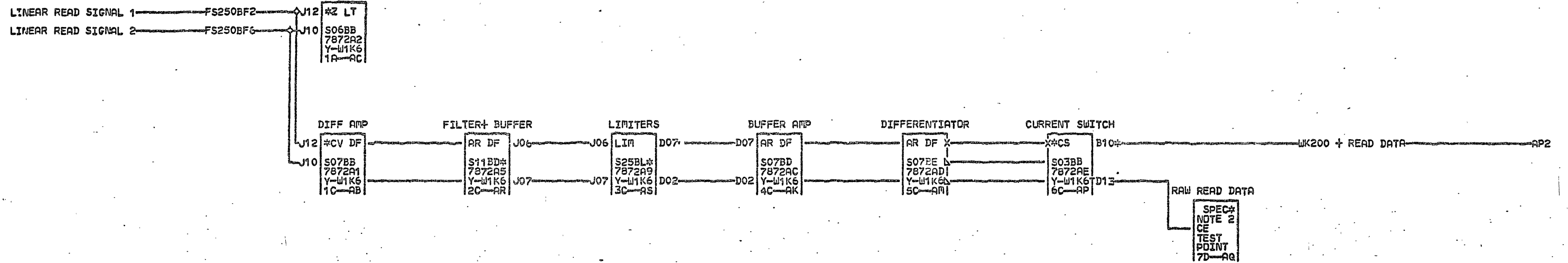
BF2 Z-W1B1B12
 50Y-W1A7B12
 BF6 Z-W1B1B13
 50Y-W1A7B13

06-06-70 392621
 07-07-70 392644
 03-03-71 392667

HEAD MATRIX AND PREAMPLIFIER			
DATE	03-23-71	RACH	5444STEP
LOG	009	FRAME	50
		PoN	2600519
IBM CORP.		BLK	BH

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F5250



NOTE 1 INPUTS CAN BE JUMPERED TO SIGNAL REQUIRED BY TAPS.
 TO SIGNAL REQUIRED BY TAPS.
 F THE FOLLOWING PINS MUST REMAIN JUMPERED FOR NORMAL USAGE--
 2 W1B6D05-W1H6G03
 6 W1B6B04-W1H6B10
 0 W1B6B08-W1H6G04
 NOTE 2 RAW READ DATA WILL ONLY BE OBSERVED AT THIS POINT WHEN LOADING ON W1K6B10 IS REMOVED

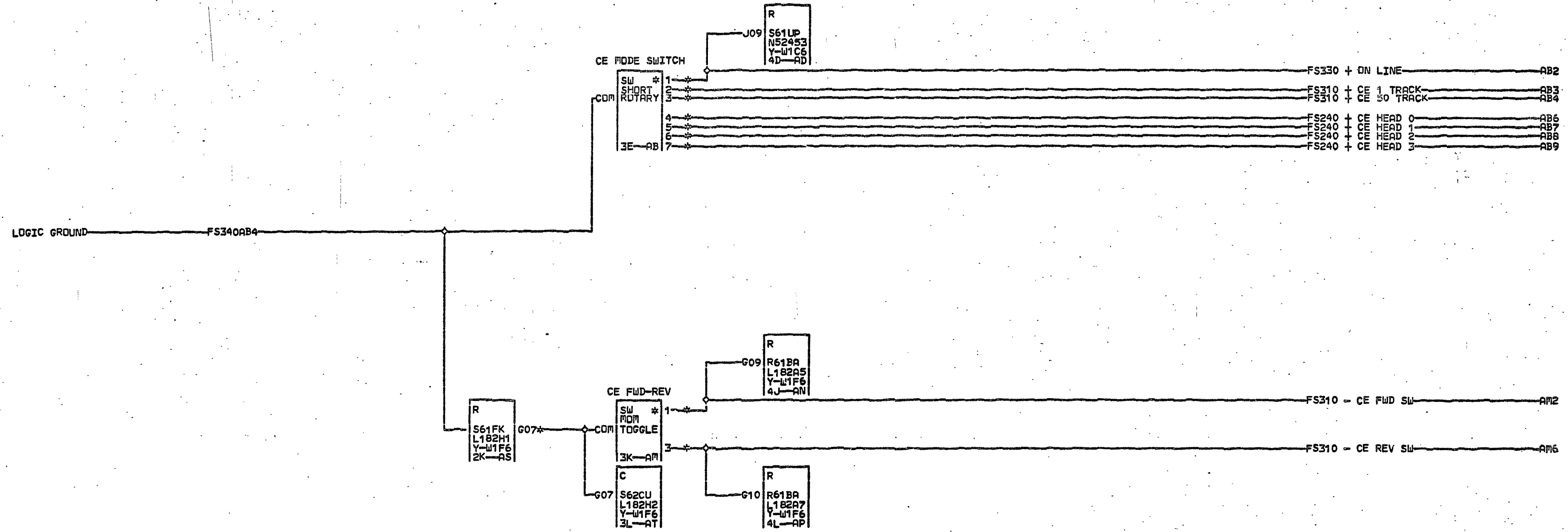
AP2 Y-W1N5B02
 AX4 Y-W1N5D03
 AY4 Y-W1N5B06
 AZ4 Y-W1N5B11

06-06-70 392621
 07-07-70 392644
 10-10-70 392648
 03-03-71 392657
 30-07-71 392694

FILTER LIMITER AND DETECTOR AND TAPS DRIVERS
 DATE 06-02-71 RACH# 5444STEP
 LOG 015 FRAME 50
 P.No 26C0520
 IBM CORP. BLK# 55

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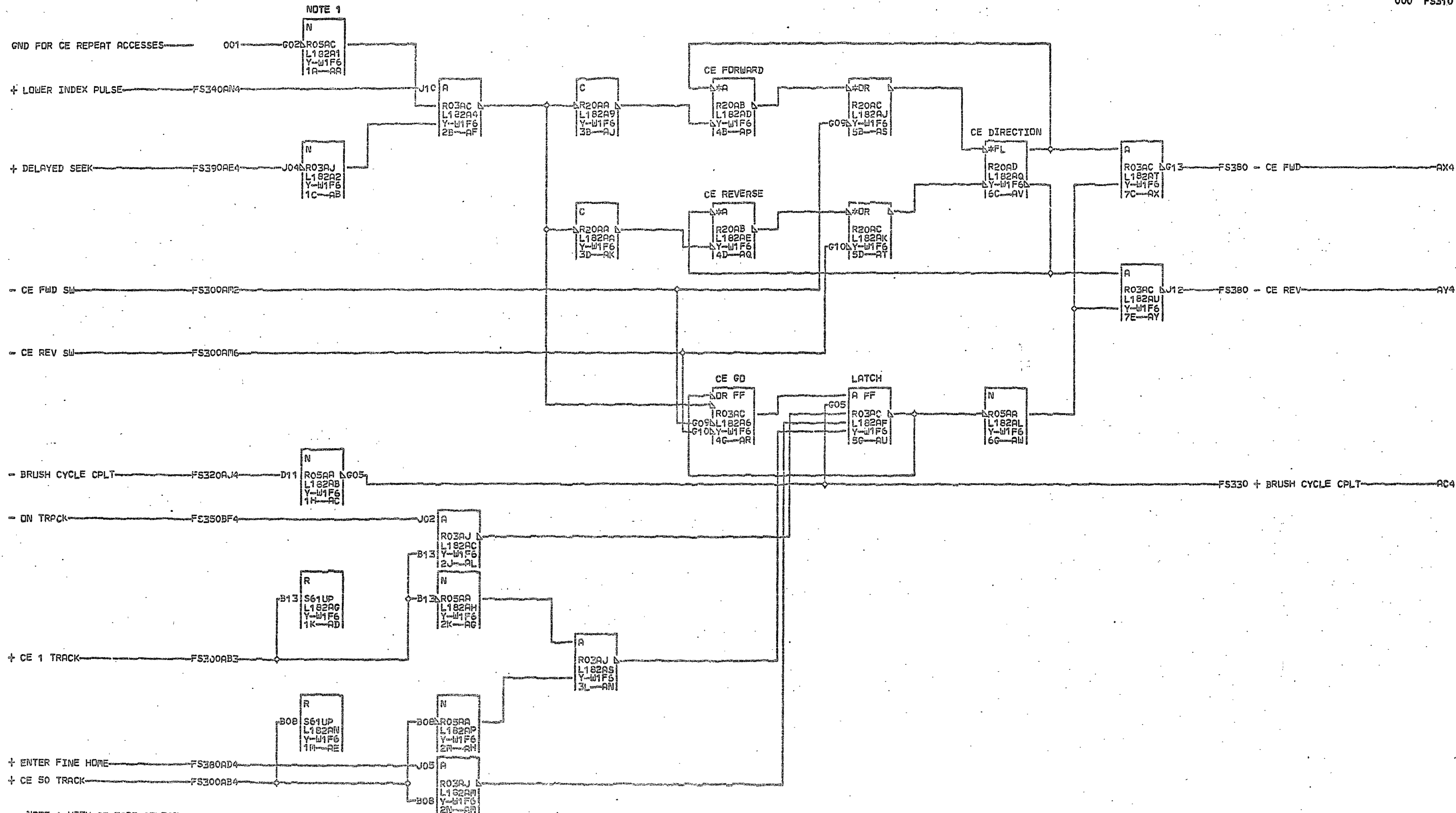
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AB2 Y-W1M7D02	AB8 Z-W1B2B07
AB3 Y-W1M7D04	50Y-W1M7D10
AB4 Y-W1M7D05	50Y-W1L6B07
AB6 Y-W1M7D06	AB9 Y-W1M7D11
50Y-W1M7D07	50Y-W1L6B12
50Z-W1B1D13	50Z-W1B2B12
AB7 Y-W1M7D09	AM2 Y-W1N7D1
50Y-W1L6B09	AM6 Y-W1N7D1
50Z-W1B2B09	AS4 Y-W1N7B12

06-06-70 392621
07-07-70 392644
11-11-70 392652
03-03-71 392667

CE SWITCHES			
DATE	03-23-71	MACH.	5444STEP
LOG	009	FRAME	50
		Pan.	2600821
IBM CORP.	BLK.		ALL

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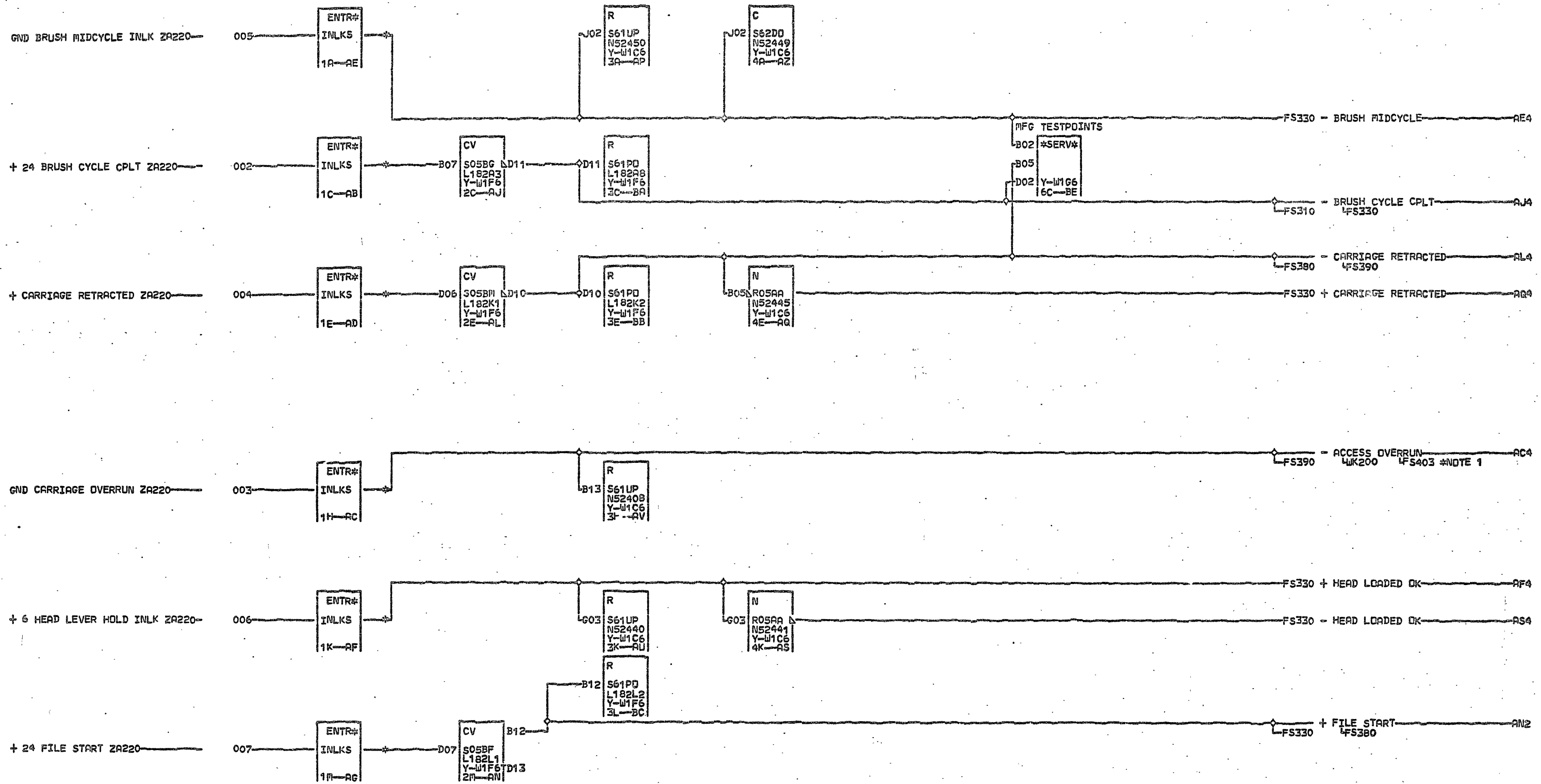
NOTE 1 WITH CE MODE-SELECT SWITCH SET TO 1 TRACK OR 50 TRACK POSITION AND F602 JUMPED TO F608 THE CARRIAGE WILL OSCILLATE OVER 1 OR 50 TRACKS

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06-06-70 392621
07-07-70 392644
03-03-71 392657

CE CONTROL			
DATE	03-23-71	MACH.	5444STEP
LOG	009	FRAME	50
		P.N.	2600522
IBM CORP.	BLK.		AZ

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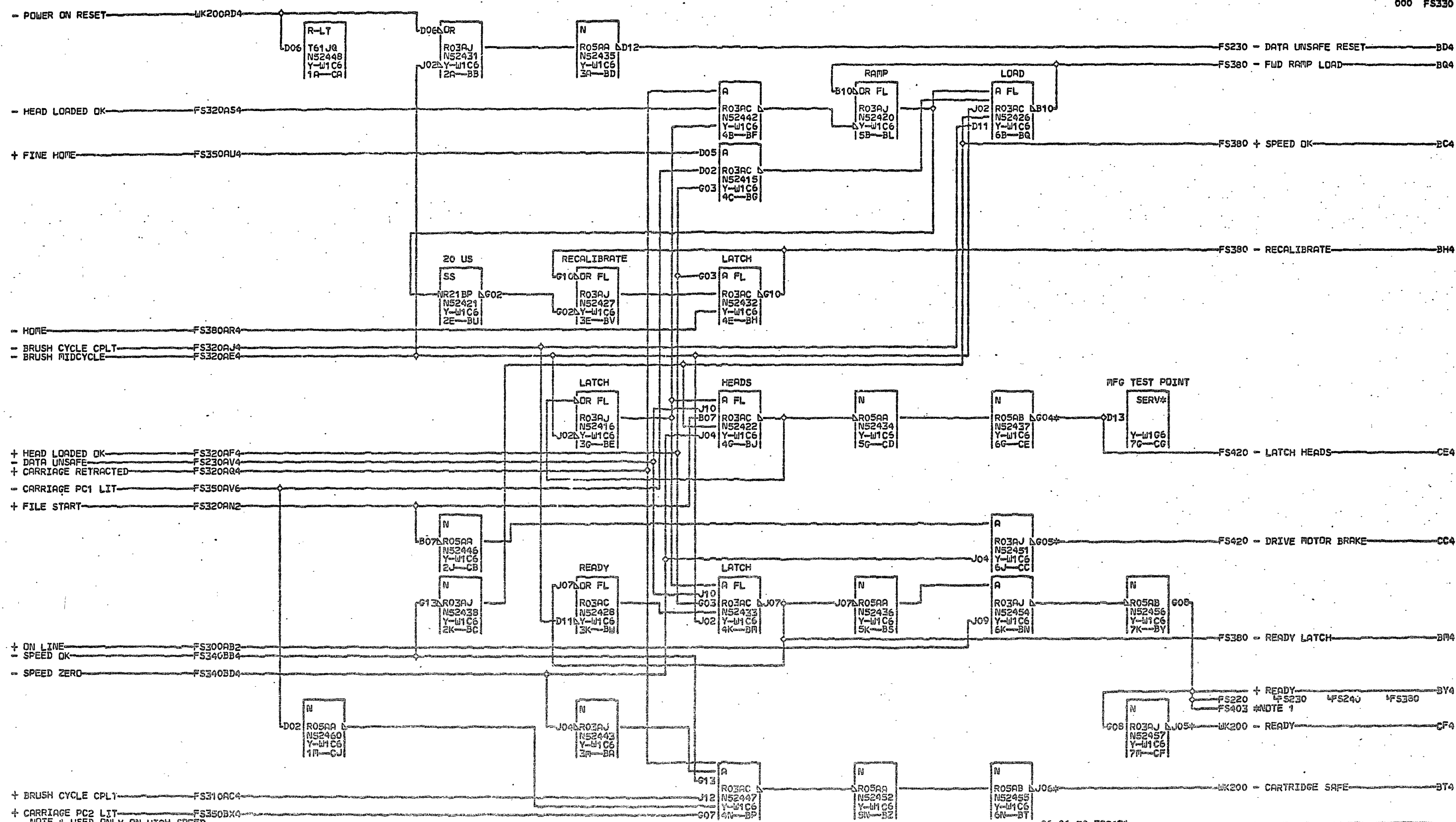
NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE

- AB4 Y-W1N7P07
- AC4 Y-W1N7D06
- 50Y-W1N6B09
- AD4 Y-W1N7D05
- AE4 Y-W1N7D07
- AF4 Y-W1N7B05
- AG4 Y-W1N7B10

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 11-11-70 392652
 03-03-71 392667

MICROSWITCH INTERLOCKS			
DATE	03-23-71	MACH.	5444STEP
LDG	011	FRAME	50
		PaNo	250023
IBM CORP.	BLK	BF	

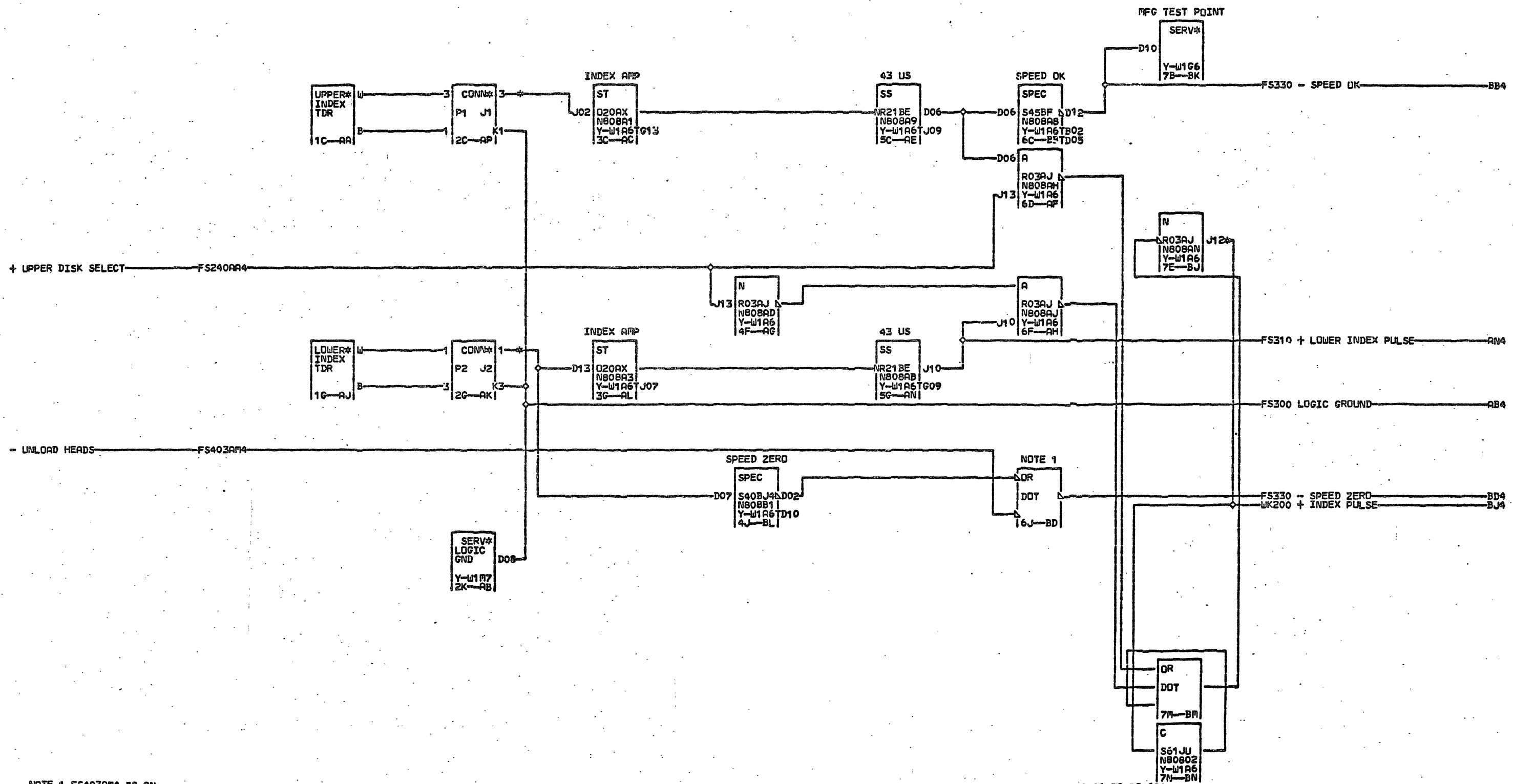
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+ BRUSH CYCLE CPLT FS310AC4
 + CARRIAGE PC2 LIT FS350BX4
 NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE
 BT4 Y-W1A5D10
 CC4 Y-W1A7D04
 SOX-W1B2D10
 CE4 Y-W1A7B08
 SOX-W1B2D10
 CF4 Y-W1A5D12

06-06-70	392521
07-07-70	392644
10-10-70	392649
11-11-70	392652
03-03-71	392657
12-17-71	392659

START STOP SEQUENCE	
DATE	00-00-00 MACH. S444STEP
LOG	020 FRAME 50
P.N.	2600524
IBM CORP.	BLK. CK



NOTE 1 FS403AM4 IS AN INTERLOCK USED ONLY ON HIGH SPEED ACCESS FEATURE

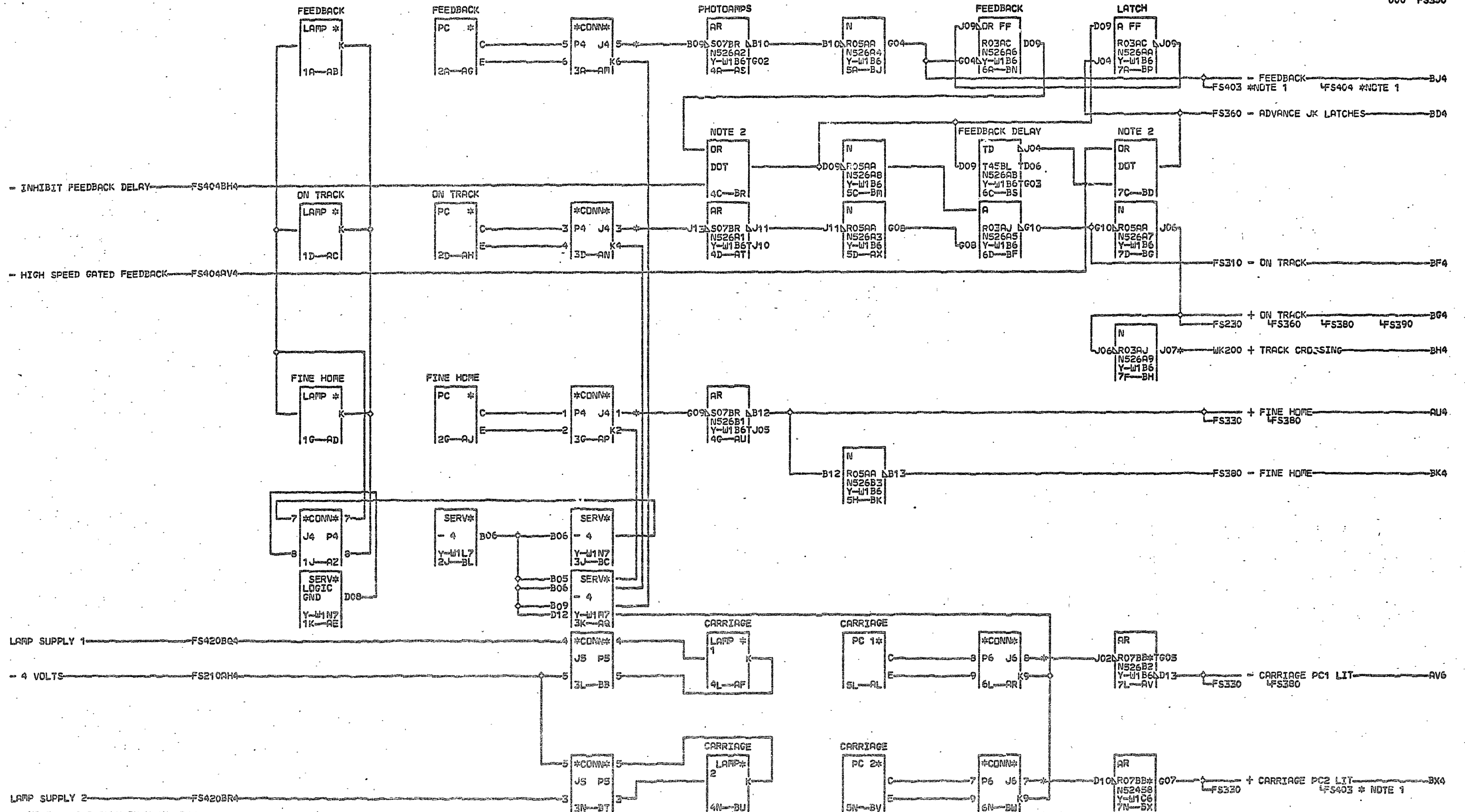
AK2 Y-W1A7B03
AP2 Y-W1A7B02
BJ4 Y-W1A6B13

06-06-70 392521
07-07-70 392644
10-10-70 392649
03-03-71 392667
12-17-71 392681

INDEX AMPLIFIERS AND SPEED SENSING			
DATE	00-00-00	MACH	5444STEP
LOG	021	FRMR	50
		PCN	3600525
IBM CORP.			

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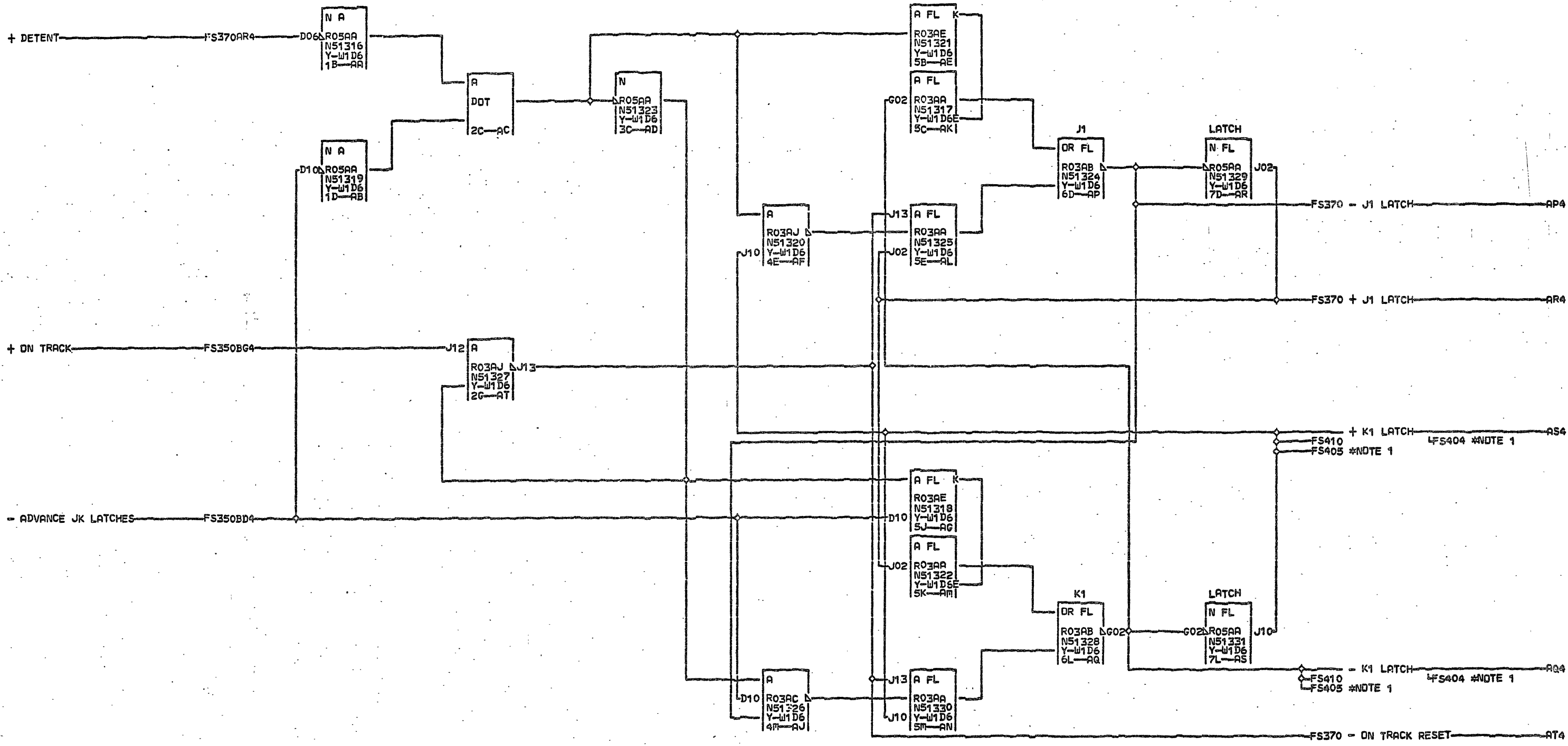
NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE
 NOTE 2 INPUTS FROM FS404 ARE USED ONLY ON HIGH SPEED ACCESS FEATURE

AM4	Y-U1A7B10
AN4	Y-U1A7B07
AP4	Y-U1A7B04
AR4	Y-U1A7B03
BH4	Y-U1A6D11
BU4	Y-U1A7D13

PHOTOAMPS

06-06-70	392621
07-07-70	392644
10-10-70	392649
11-11-70	392652
05-03-71	392657
30-07-71	392694

PHOTOAMPS			
DATE	08-02-71	MACH.	5444STEP
LOG	015	FRAME	50
		P.No.	2600525
		BLK.	BY



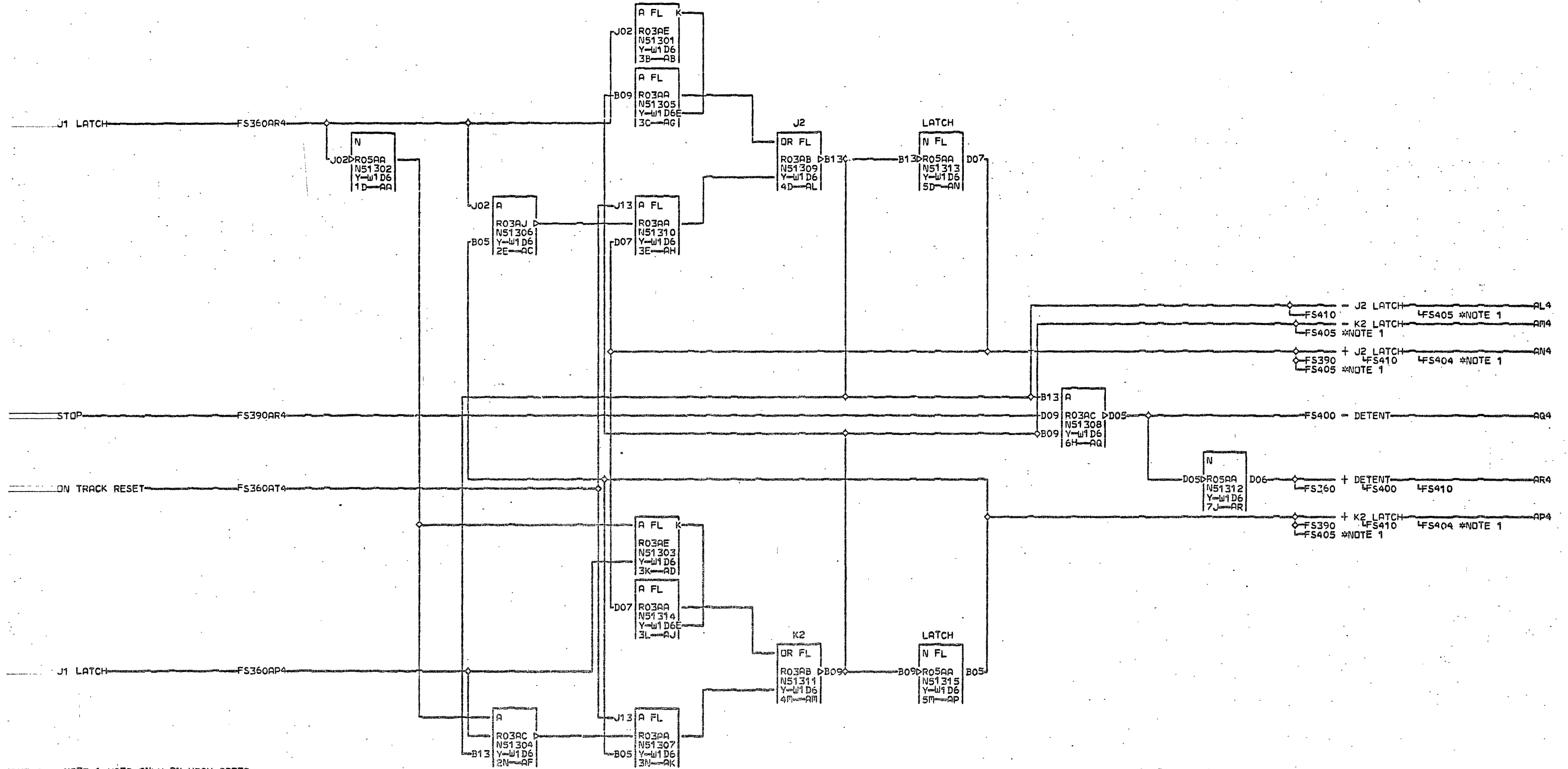
NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 03-03-71 392667

J1 AND K1 LATCHES		
DATE	03-23-71	MACH. 5444STEP
LDG	012	FRAME 50
	HEARN P.No.	2600527
IBM CORP.	BLK.	ALL

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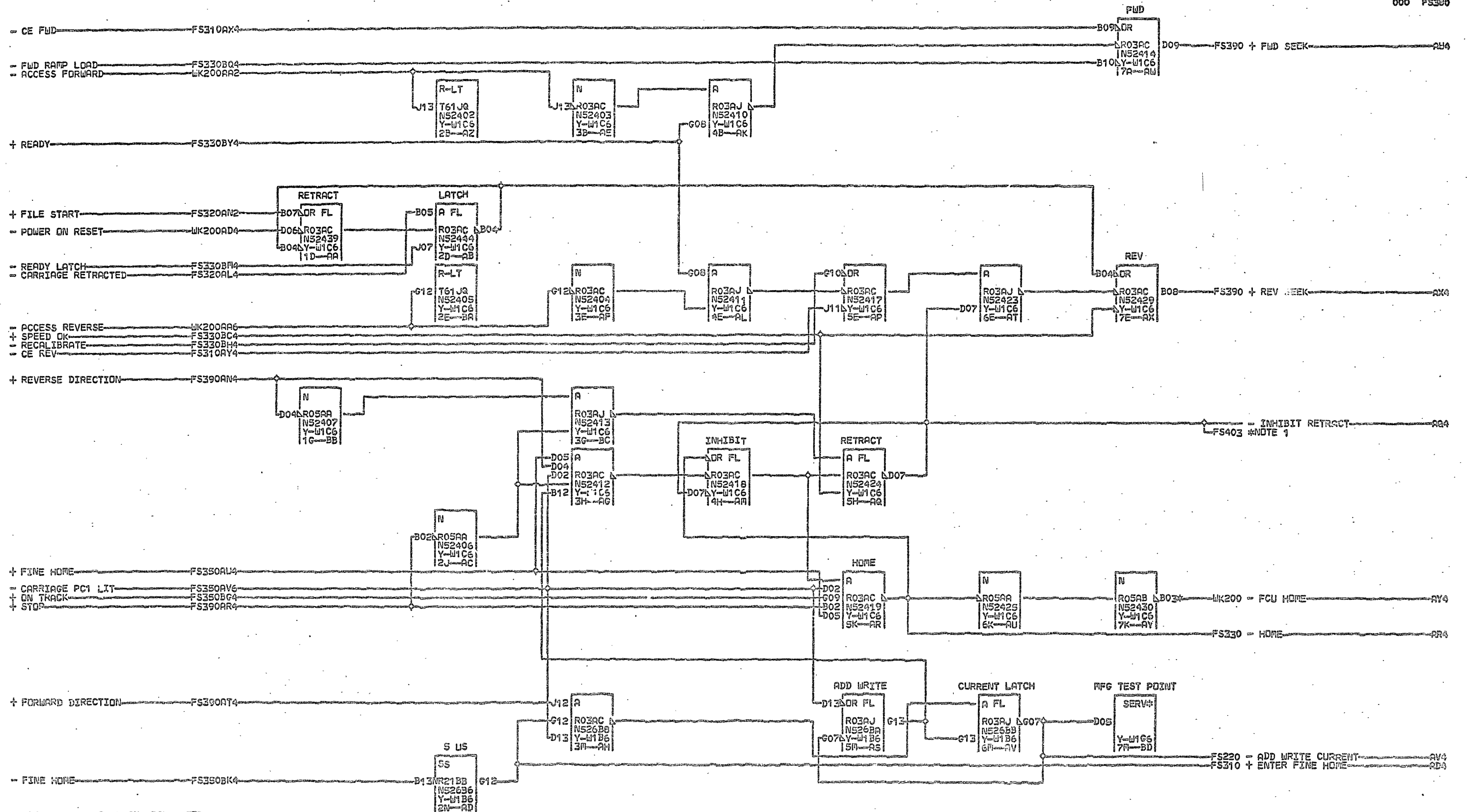


NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE

06-06-70 392621
07-07-70 392644
10-10-70 392649

J2 AND K2 LATCHES			
DATE	11-18-70	MACH	STEPFILE
LDG	046	FRAME	50
	HEARN	P.No.	260052B
IBM CORP.	BLK		AS

FORM 0 000



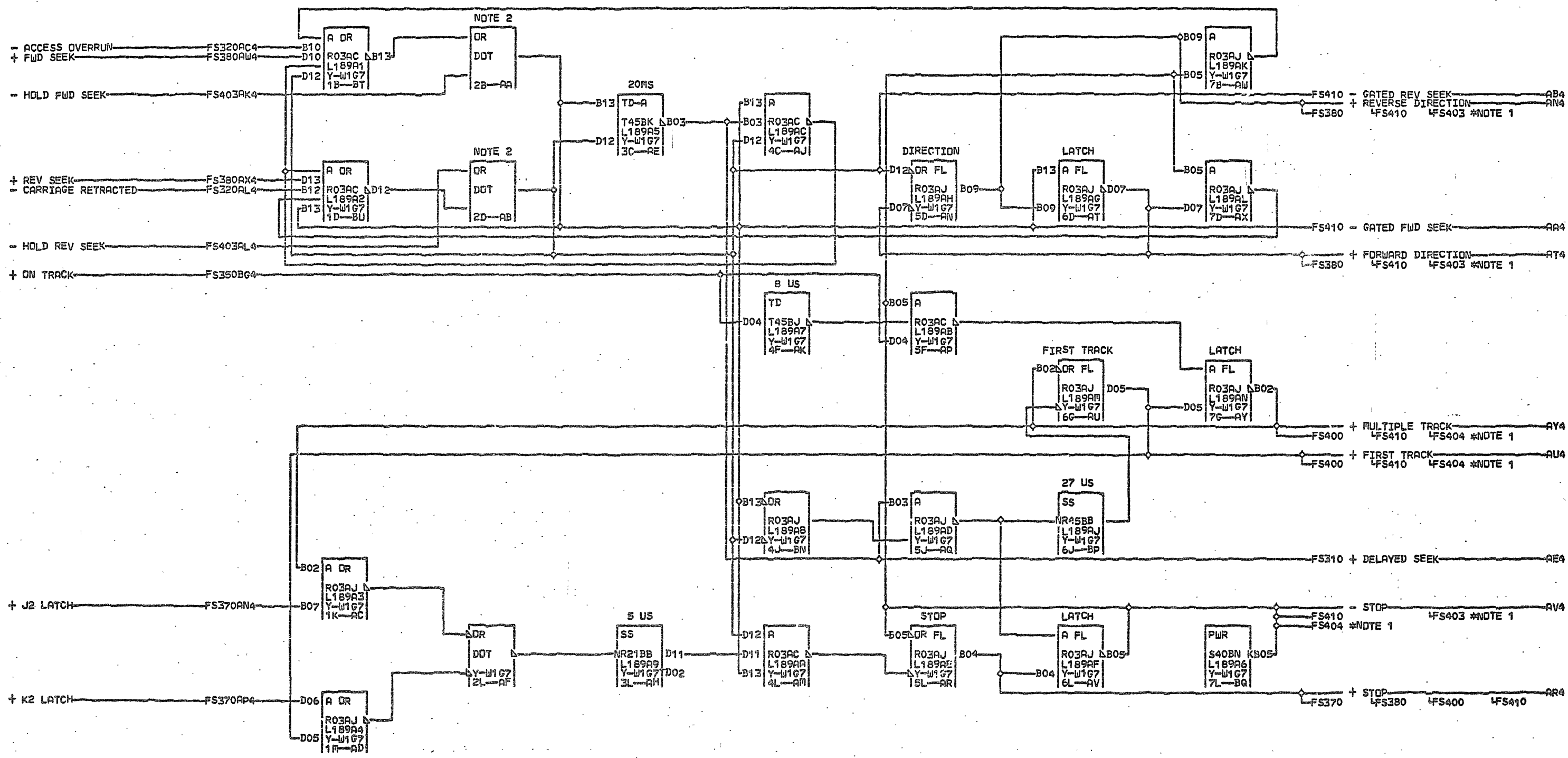
NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE AY4 Y-W1R6B10

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 11-11-70 392652
 02-03-71 392667
 30-07-71 392694

FORWARD-REVERSE COMMANDS		
ADD WRITE CURRENT		
DATE	08-02-71	MACH. 5448STEP
LOG	015	FRAME 30
HEARN P.O. #609529		
IBM CORP.	BLK.	SE

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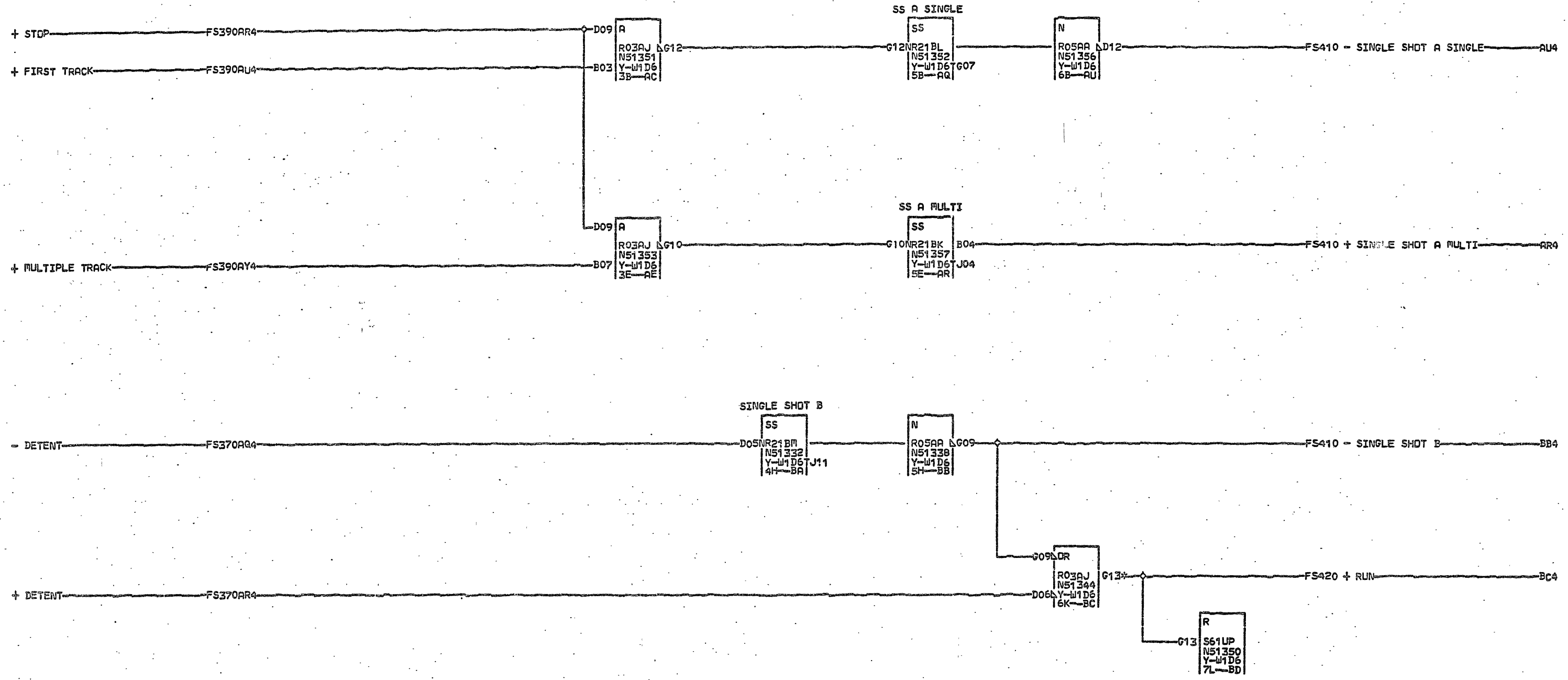


NOTE 1 USED ONLY ON HIGH SPEED ACCESS FEATURE
 NOTE 2 INPUTS FROM FS403 ARE USED ONLY ON HIGH SPEED ACCESS FEATURE

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 03-03-71 392667

ACCESS CONTROL		
DATE	03-23-71	MACH. 5444STEP
LDG	012	FRAME 50
	HEARN PaN.	2600530
IBM CORP.	BLK.	BV

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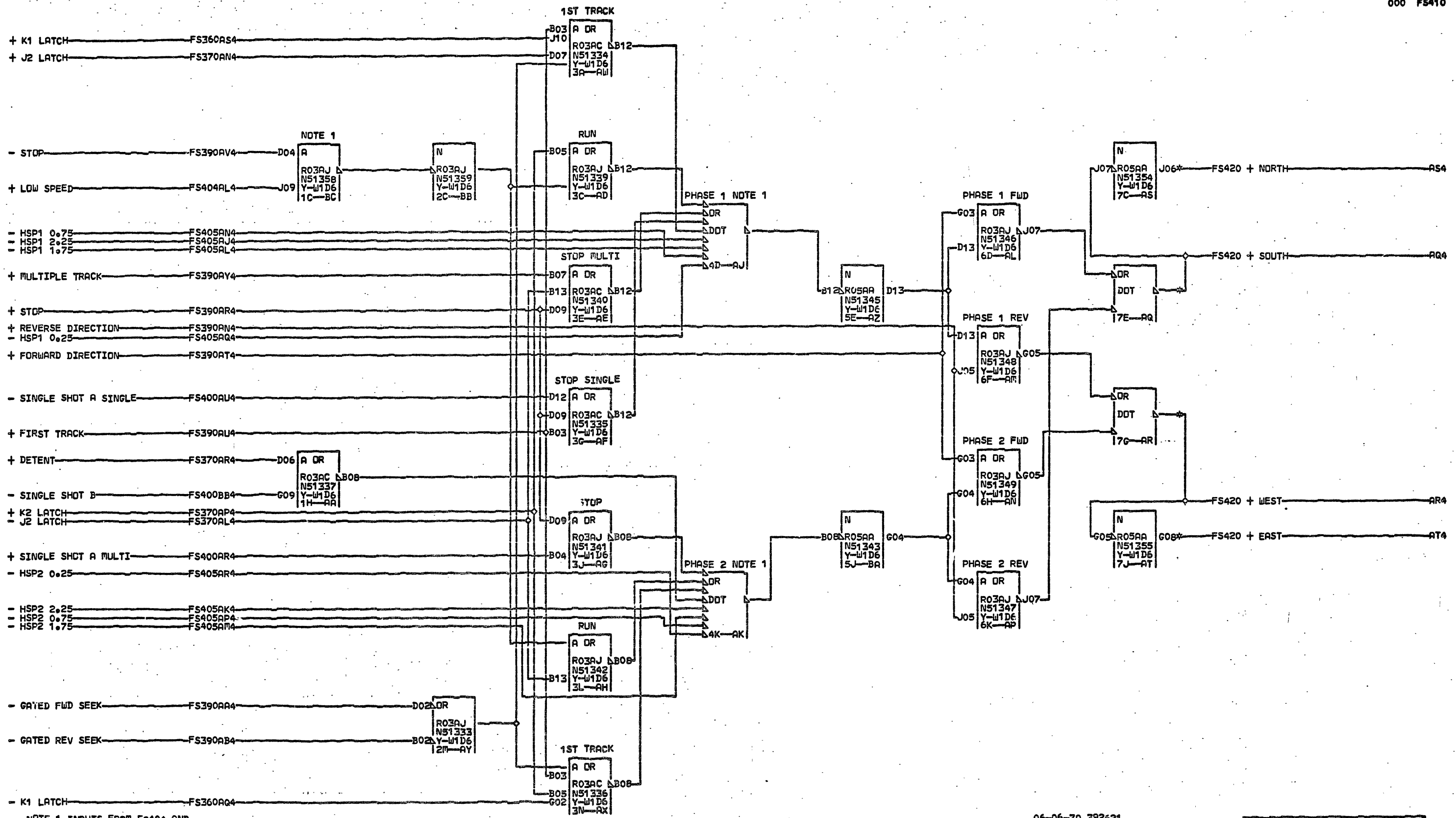
BC4 Y-W1N7D11
50X-W1B1J11

06-06-70 392621
07-07-70 392644
10-10-70 392649
03-03-71 392657

DECELERATION CONTROL SINGLE SH			
DATE	03-23-71	ROCN	7444STEP
LOG	009	FRAME	50
		PAGE	2400531
IBA CORP.		DLG	551

FS
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NOTE 1 INPUTS FROM FS404 AND FS405 ARE FLOATING UNLESS HIGH SPEED ACCESS FEATURE IS FITTED

50X-W1B2D06
AR4 Y-W1N7B09
50X-W1B2D04
AS4 Y-W1N7D10
50X-W1B2D02
AT4 Y-W1N7D02
50X-W1B2B03

06-06-70 392621
07-07-70 392644
10-10-70 392649
11-11-70 392652
03-03-71 392667

PHASE AND DIRECTION SELECTION

DATE 03-23-71 MACH. 5444STEP

LOG 012 FRAME 50

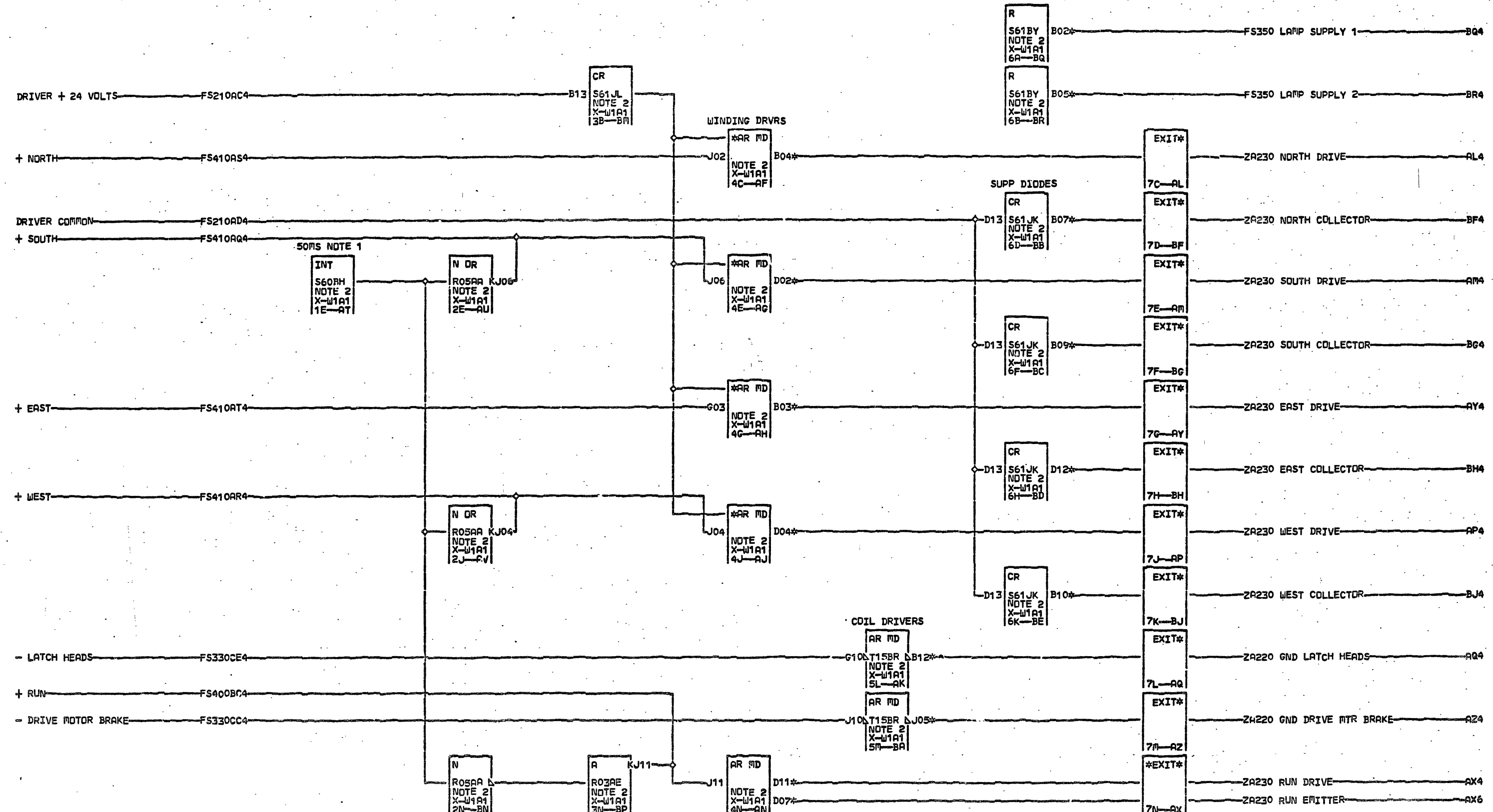
PaNo 2600537

IBM CORP. BLK. Bn

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FS410
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7 OHMS TO GND

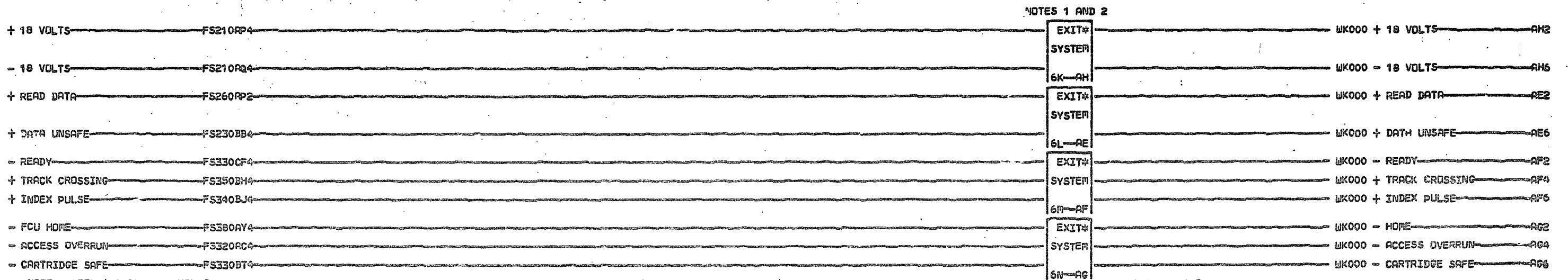
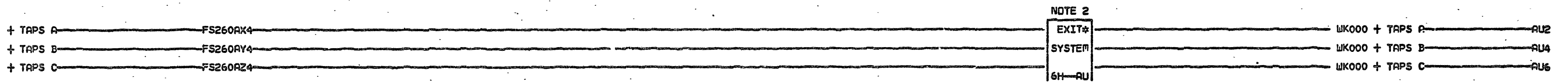
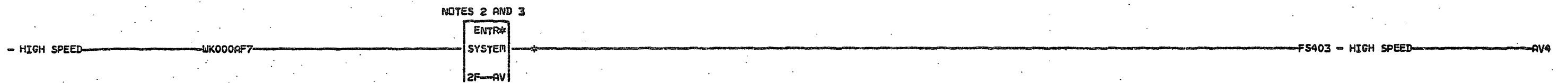
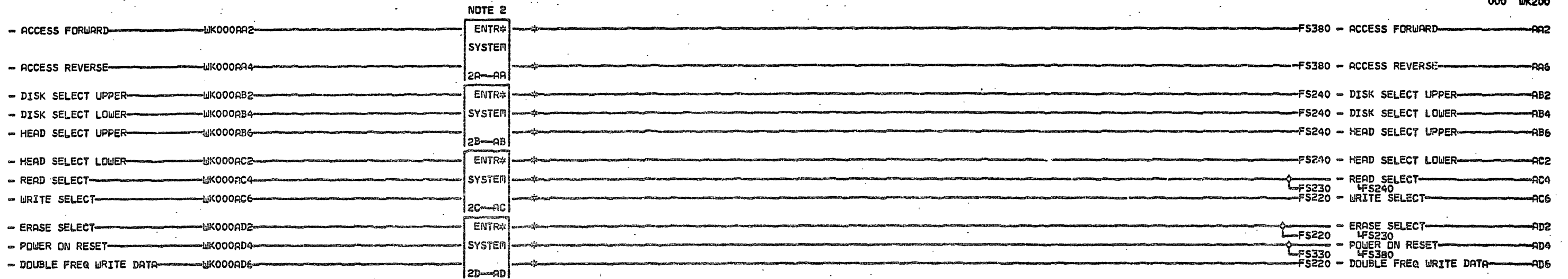


NOTE 1 SINGLE SHOT FORCES NE MOTOR ENERGISATION FOR 50MS AFTER 24V COMES UP BY HOLDING S S AND W DOWN
 4 NOTE 2 CARD IN X-W1A1 IS PN 2 SE62519 FOR BASIC MACHINE 0 OR PN 5860192 FOR HIGH SPEED ACCESS FEATURE.

AF4 X-W1B1B04 BC4 X-W1B1B09
 AG4 X-W1B1D02 BD4 X-W1B1D12
 AH4 X-W1B1B03 BE4 X-W1B1B10
 AJ4 X-W1B1D04 BG4 X-W1B1B02
 AK4 X-W1B1D12 BR4 X-W1B1B05
 AN4 X-W1B1D11
 AP4 X-W1B1D07
 AR4 X-W1B1J05
 AS4 X-W1B1B07

06-06-70 392621
 07-07-70 392644
 10-10-70 392649
 11-11-70 392652
 03-03-71 392667

DRIVERS			
DATE	03-23-71	MACH.	5444STEP
LOG	012	FRAME	50
		PN.	2600533
IBM CORP.		BLK.	BT



NOTE 1 BOTH +18 AND -18 VOLTS USE 2 LEADS EACH IN THE FCU
 W TAPE CABLE
 K NOTE 2 SYSTEM PAGE WK000
 2 APPLIES TO SPINDLE 0 AND WK010
 0 APPLIES TO SPINDLE 1
 0 NOTE 3 USED ONLY ON HIGH SPEED ACCESS FEATURE

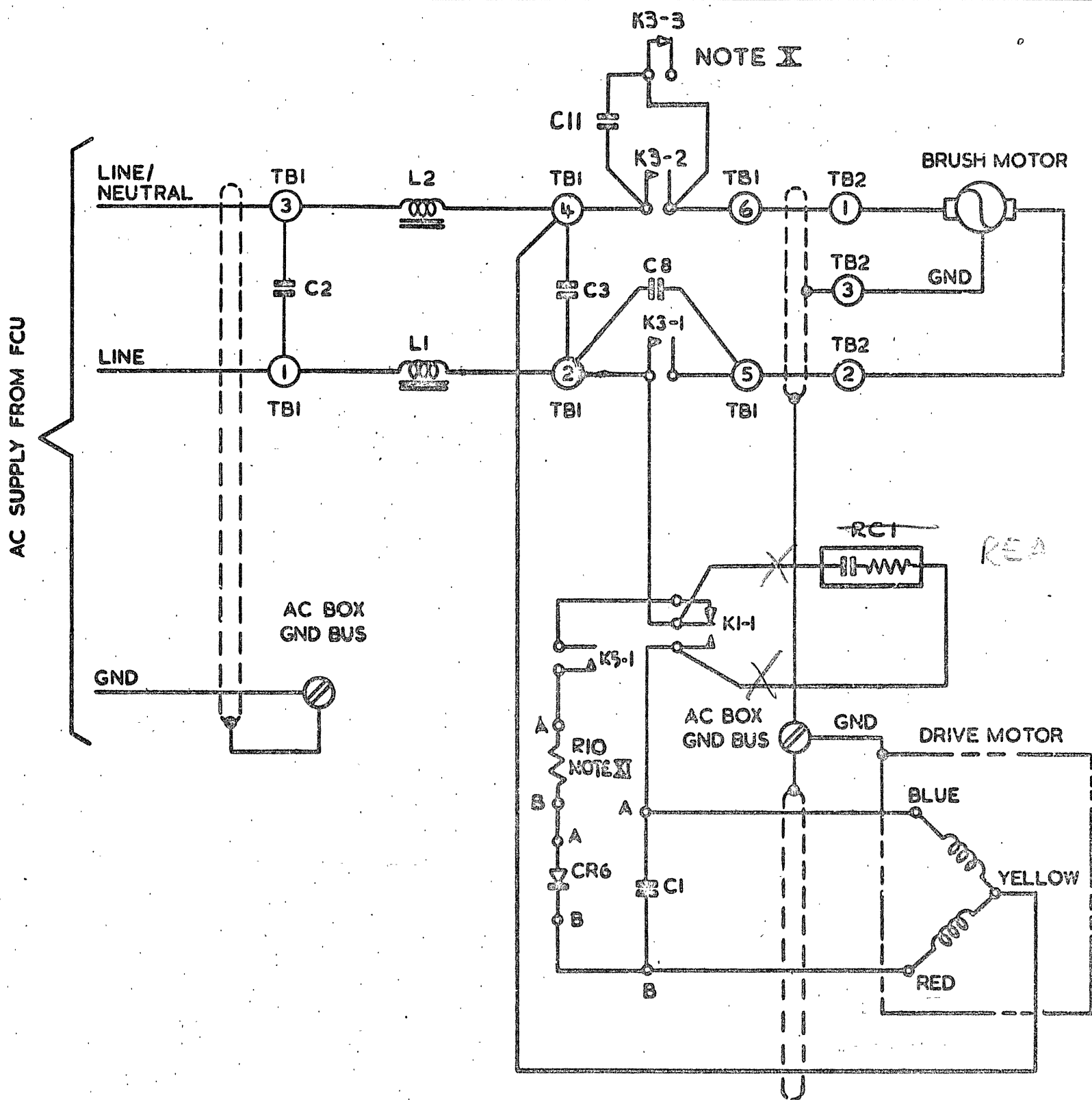
AA2	Y-W1N6D12	AD4	Y-W1N6D13
AA6	Y-W1N6D13	AD6	Y-W1N6B03
AB2	Y-W1N6B10	AV4	Y-W1N6B11
AB4	Y-W1N6B09		
AB6	Y-W1N6D08		
AC2	Y-W1N6D05		
AC4	Y-W1N6D11		
AC6	Y-W1N6D12		
AD2	Y-W1N6B12		

10-10-70 392649
 03-03-71 392667
 12-17-71 392681

SYSTEM-FILE INTERFACE			
DATE	00-00-00	PAGE	5444STEP
LOG	021	FRAME	50
		Page	2600514
IBM CORP.	BLK		000

2600505

ZA200



NOTES

- X K3-3 N/C USED ONLY FOR A JUMPER POINT
- XI RIO USED ON 60 HZ MACHINES ONLY.

DRIVE AND BRUSH MOTOR

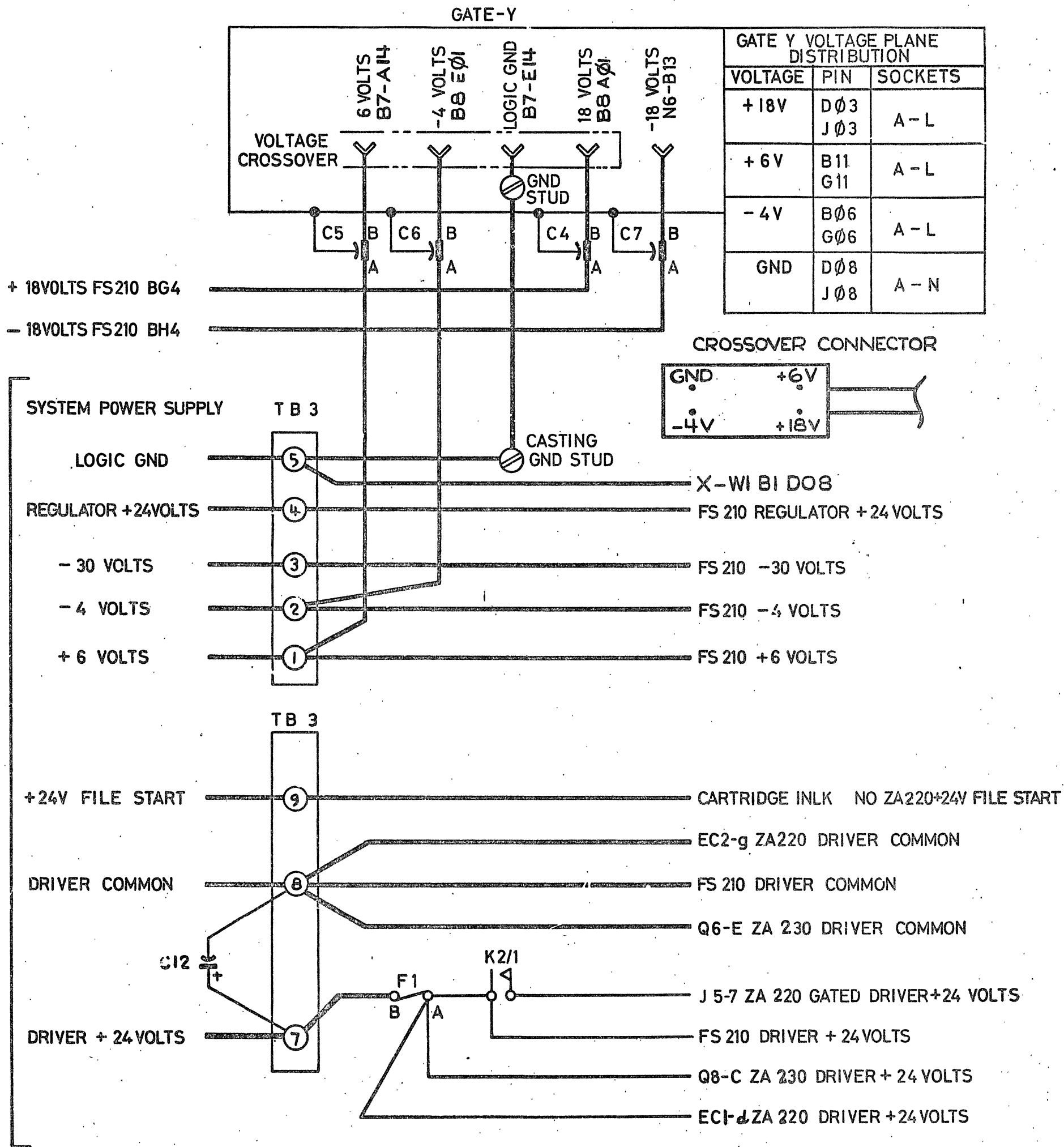
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INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHARGE NO.	DATE	CHARGE NO.	TECHNICAL APPROVAL	DEVELOPMENT NO.
NAME	SYS DIAG	6/27/70	392621			CIRCUIT AND P.G.	ZA200
DESIGN	EPD	29 SEP 70	392644				
DETAIL	UAD	18 DEC 70	392652				
CHECK	CT	24 JAN 71	392117				
APPRO	RET	21 JUL 72	392773				

2600505

2600506

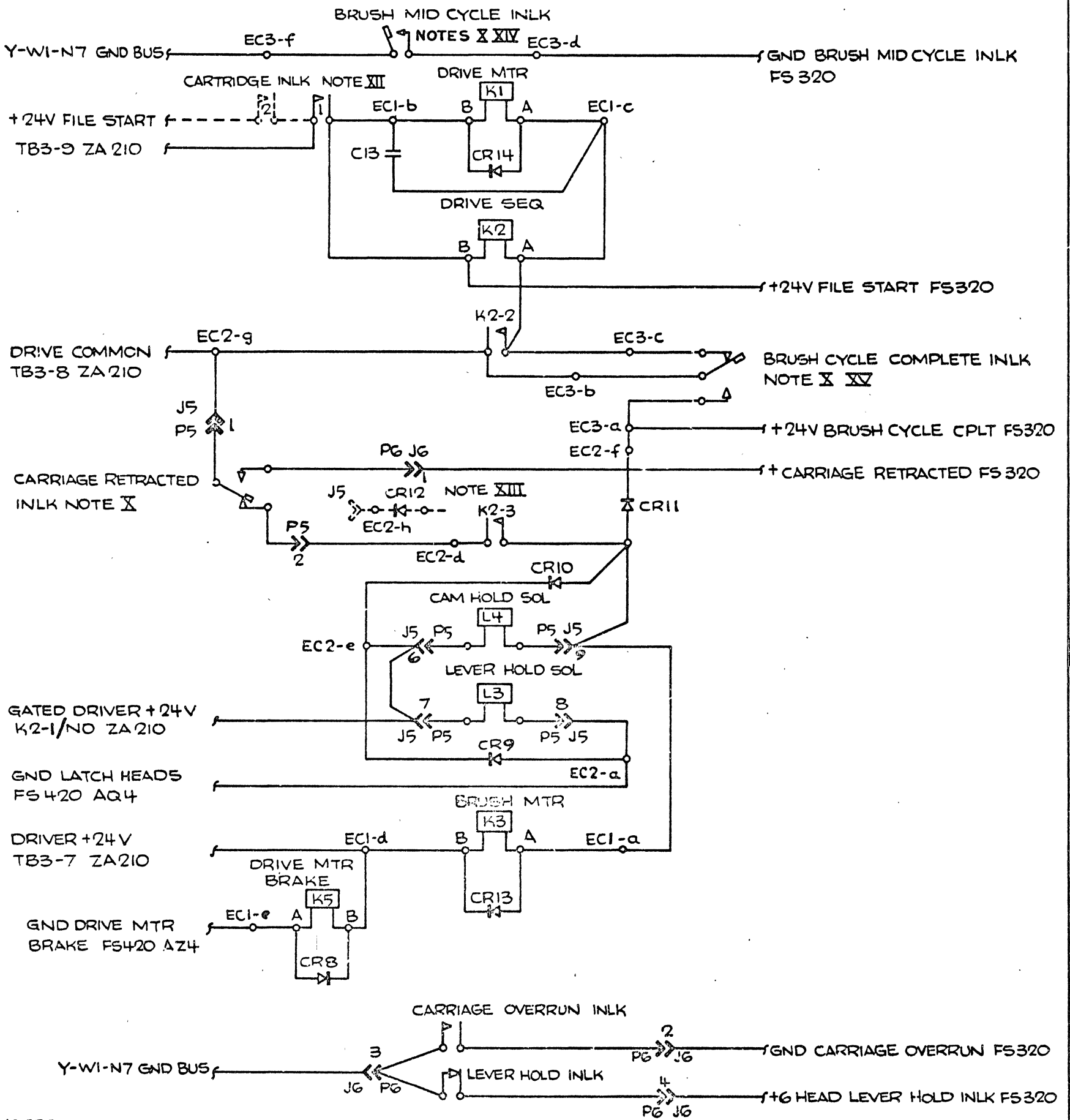
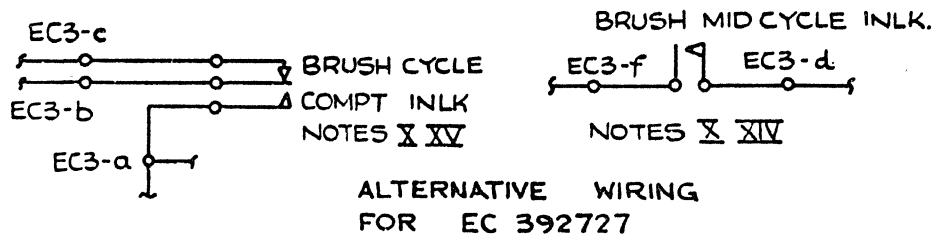
ZA 210



DC DISTRIBUTION

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	TECHNICAL APPROVAL	DEVELOPMENT NO.
NAME	SYS DIAG	6 JUN 70	392621	17 DEC 71	392681	CIRCUIT AND PRG.	ZA 210
DESIGN	ROR 4 MAY 70	29 SEP 70	392644				
DETAIL	J.D.K 6 OCT 70	14 DEC 70	392655				
CHECK	C.T. 16 OCT 70	18 DEC 70	392652				
APPRO	A.R.H 13 OCT 70	1 JAN 71	392658				

2600506

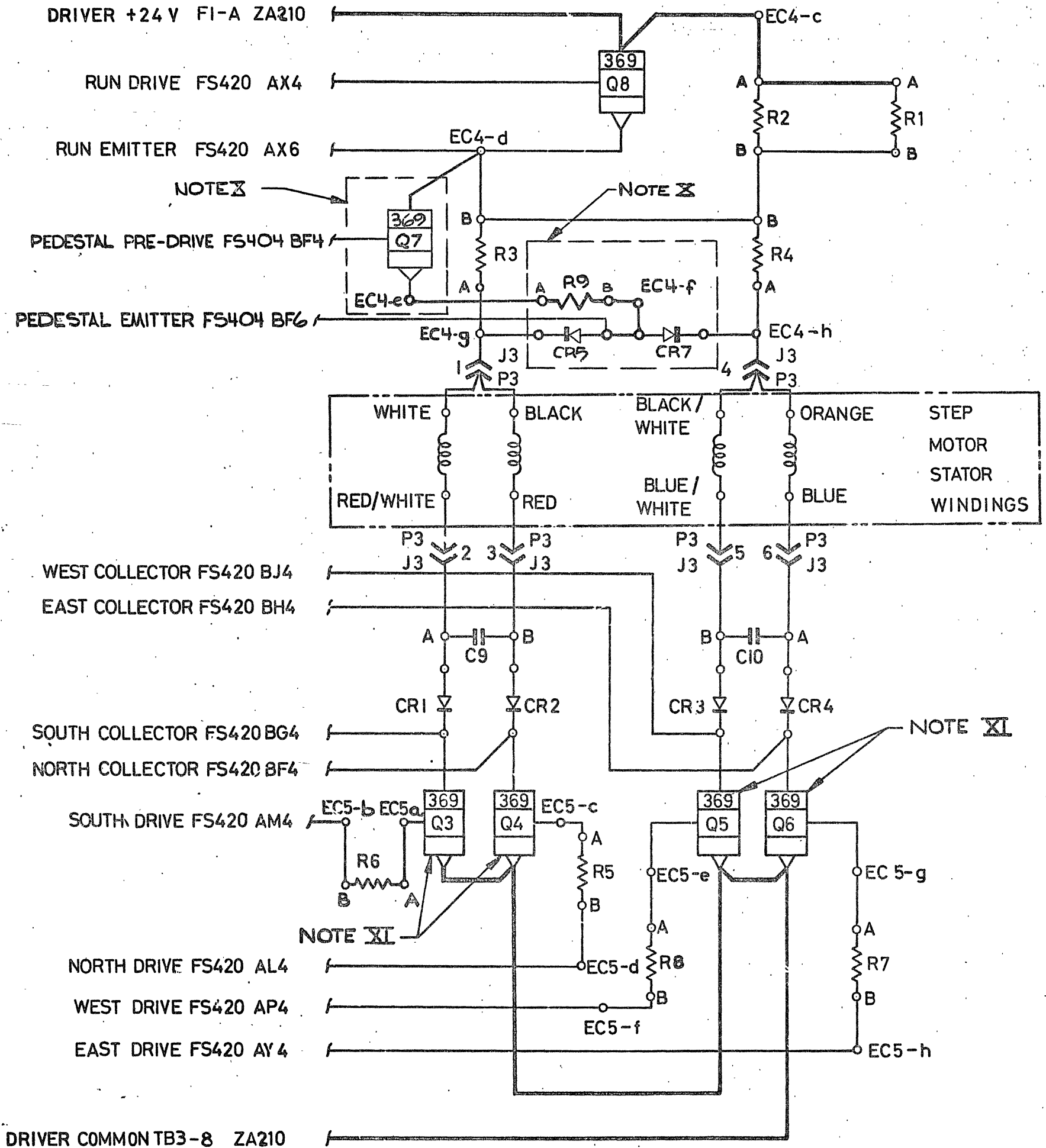


NOTES

- X INLKS SHOWN WITH BRUSHES AND CARRIAGE RETRACTED.
- XI FOR CONNECTIONS TO EC3 REFER TO Z2200
- XII MACHINES MAY HAVE ONLY ONE CARRIAGE INLK FITTED
- XIII NOT FITTED ON LATER MACHINES.
- XIV 60HZ MACHINES WITH EC392727 FITTED HAVE EC3-d CONNECTED TO N/O TERMINAL.
- XV 60HZ MACHINES WITH EC392727 FITTED HAVE EC3-c CONNECTED TO N/C TERMINAL AND EC3-a CONNECTED TO N/O TERMINAL

SEQUENCING.

IBM				DATE	CHANGE NO	DATE	CHANGE NO
NAME	SYS DIAG			SEE E.C. HISTORY			
DESIGN	ROR	14 SEP 70	SHT 1 OF 1	RED	19 DEC 72	392721	
DETAIL	SEP 19 1973						
CHECK	I.R.M.	30 APR 73					
APPRO	B.A.H.	29 SEP 70					
DEVELOPMENT NO						LOGIC PG NO	
						ZA 220	



NOTES

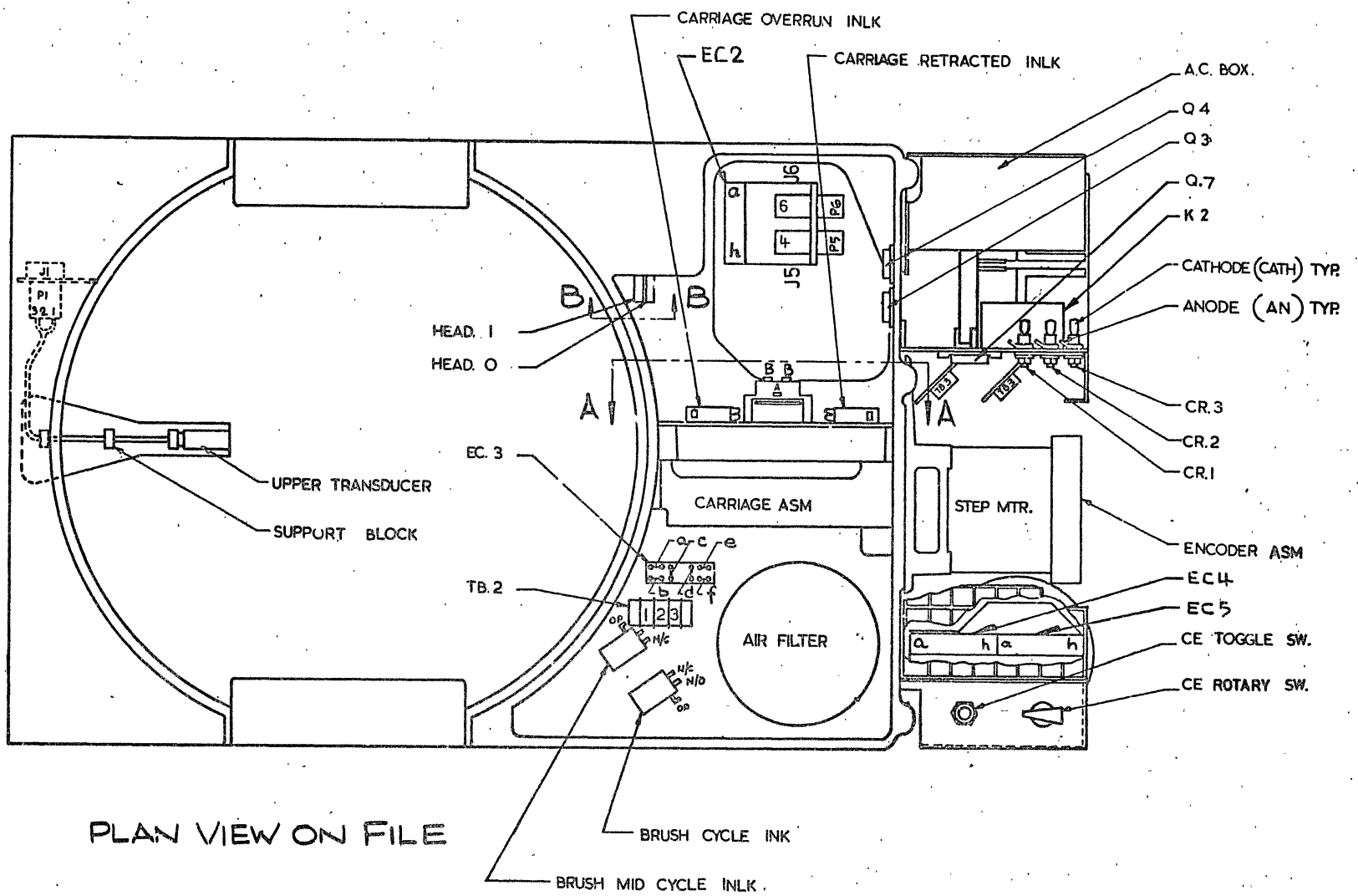
- X COMPONENTS AND ASSOCIATED WIRING SHOWN ENCLOSED IN AREAS INDICATED USED FOR HIGH SPEED ACCESS FEATURE ONLY
- XI FOR Q3, Q4, Q5 AND Q6 SUBSTITUTE TRANSISTOR TYPE 957 FOR W.T. USE ONLY

STEP MOTOR NETWORK

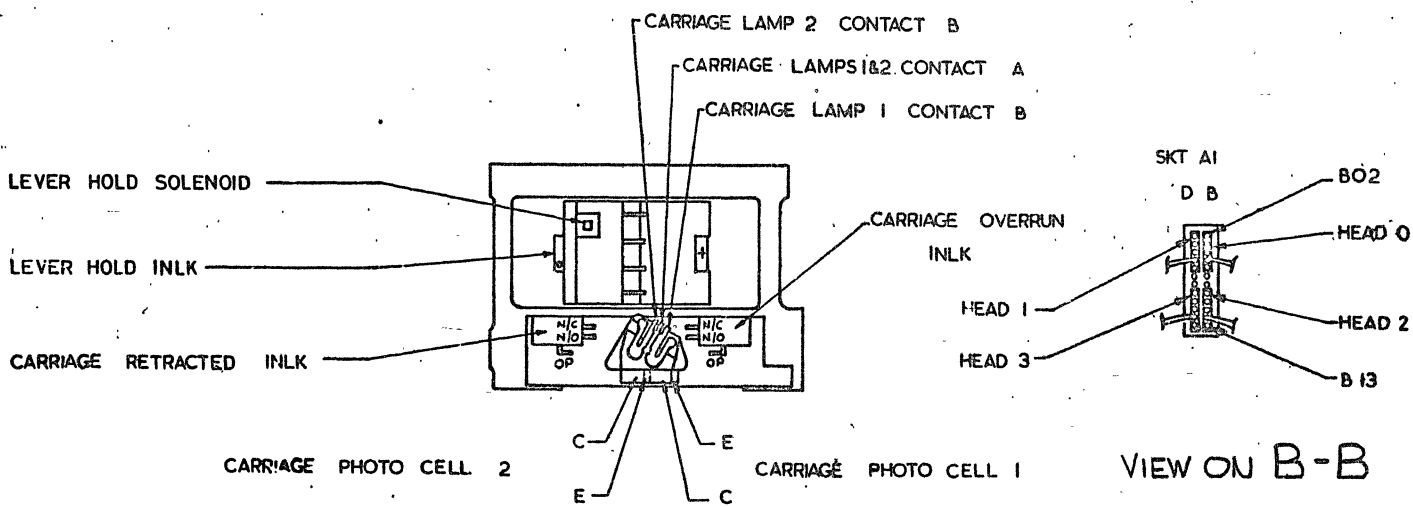
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	TECHNICAL APPROVAL	DEVELOPMENT NO.
NAME	SYS DIAG	6 JUN 70	392621	17 DEC 71	392681	CIRCUIT AND PKG.	ZA 230
DESIGN	ROB 4 MAY 70 SCALE	29 SEP 70	392644				
DETAIL	AG 4 MAY 70	23 NOV 70	392649				
CHECK	C.T. 5 MAY 70 STD'S CODE	18 DEC 70	392652				
APPRO	A.R.T. 6 JUN 70	1 JAN 71	392658				

2600500

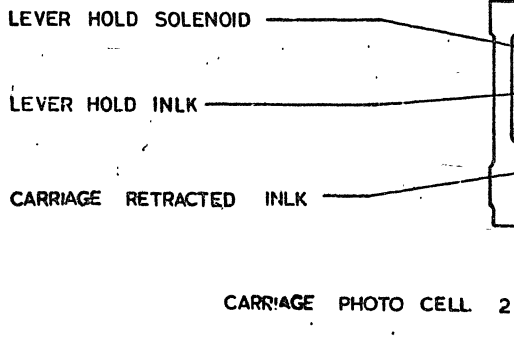
ZZ200



PLAN VIEW ON FILE



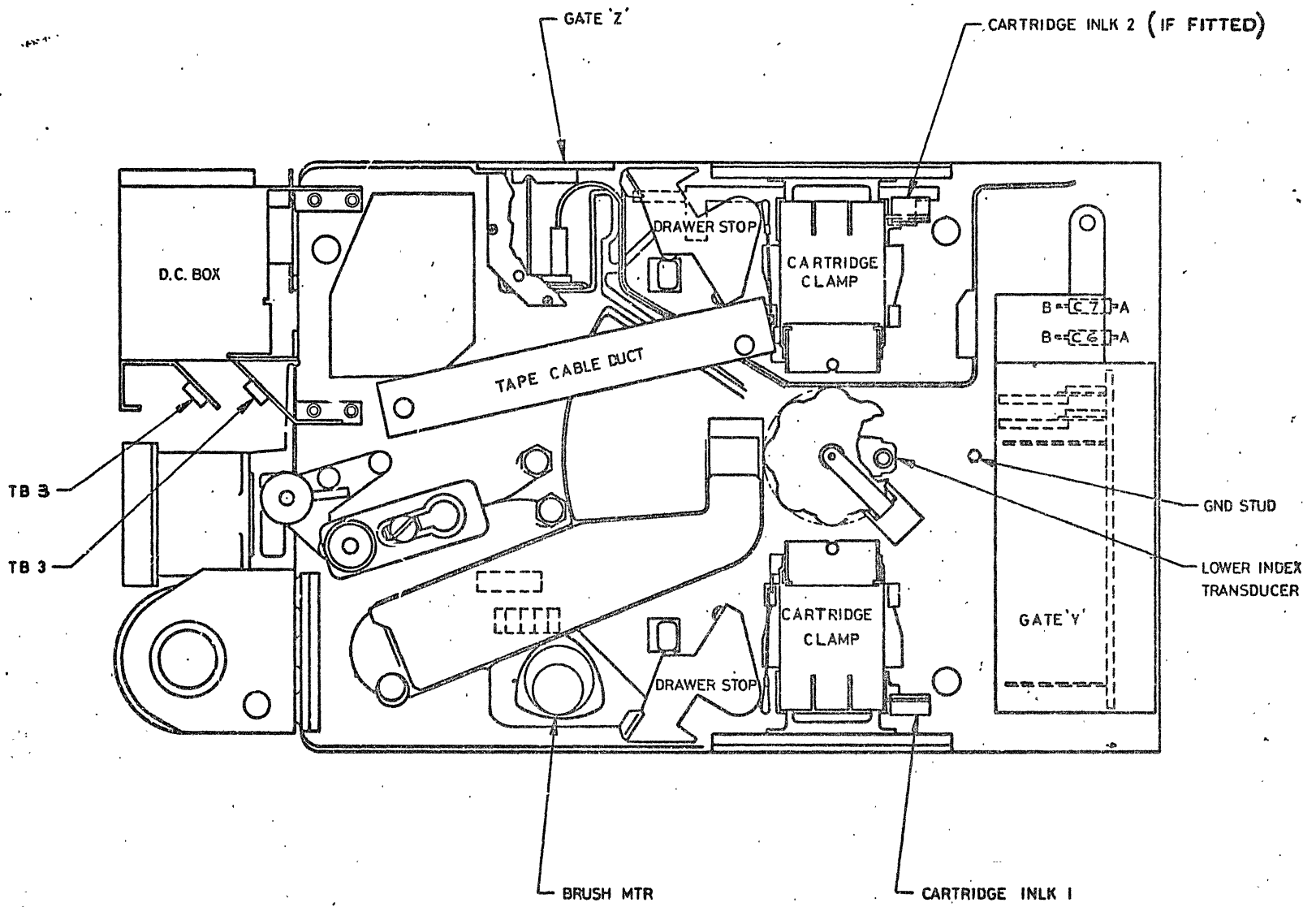
VIEW ON B-B



VIEW ON A-A

ROTATED THROUGH 180°

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO	DATE	CHANGE NO	NOTE	DEVELOPMENT NO
NAME				6 JUNE 70	392621			X PRINT TO ENG SPEC. NO.	ZZ200
DESIGN				29 SEP 70	392644				
DETAIL				23 NOV 70	392649				
CHECK				18 DEC 70	392652				
APPROV				1 JAN 71	392658				
									2600500

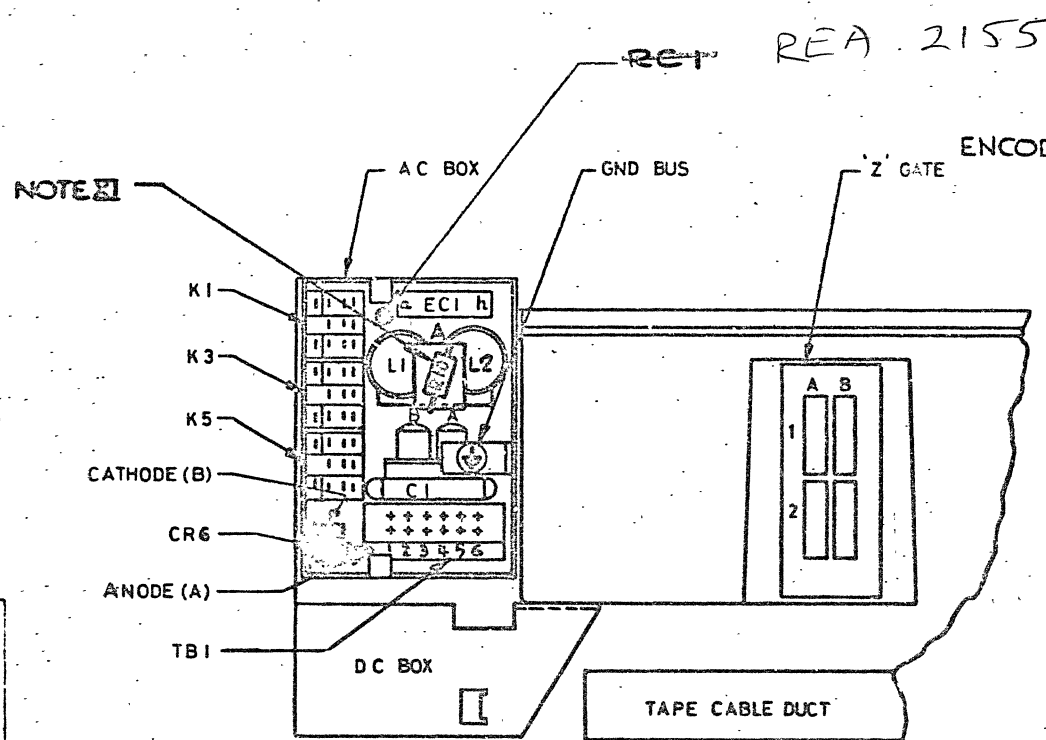


UNDERSIDE VIEW ON FILE

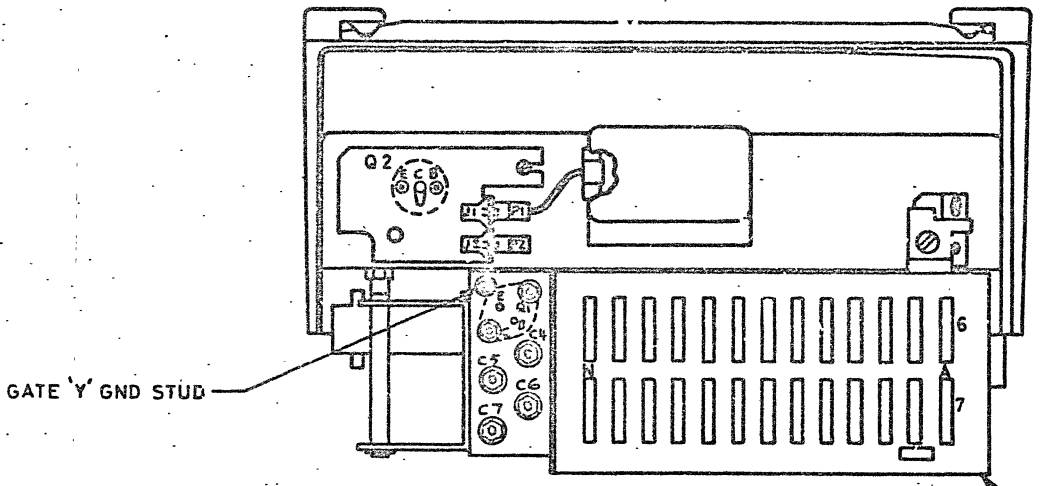
IBM U.K. LABORATORIES LTD.				DATE	CHANGE NO	DATE	CHANGE NO	NOTE	DEVELOPMENT NO
NAME				6 JUN 70	392621	17 DEC 71	392681	IF PRINT TO ENG SPEC. NO	ZZ210
DESIGN				29 SEP 70	392644				
DETAIL				23 NOV 70	392649				
CHECK				18 DEC 70	392652				
APPRO				1 JAN 71	392658				
DESIGN	ROK	2 MAR 70	MODEL						
DETAIL	AC	2 MAR 70							
CHECK	CT	3 MAR 70	DRAW						
APPRO	SET	6 JUN 70	CHECK						

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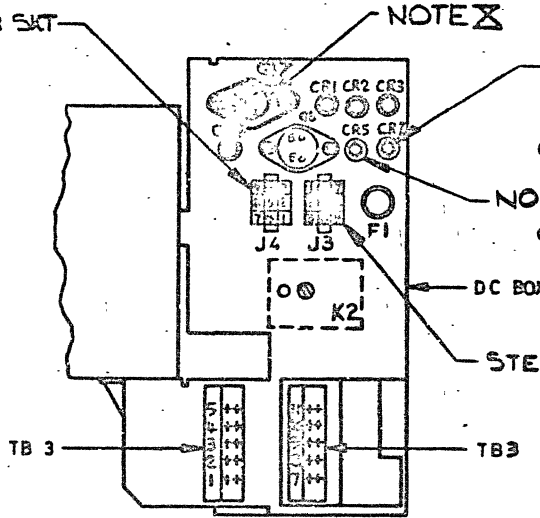
IBM U.K. LABORATORIES LTD.		DATE	CHANGED NO.	DATE	CHANGED NO.	NOTE
REVISION	DESCRIPTION	DATE	CHANGED NO.	DATE	CHANGED NO.	
1	ROB	20 JAN 70	392621	26 JAN 71	392117	
2	AC	29 SEP 70	392644	21 JUL 72	392723	
3	CT	20 NOV 70	392649			
4	CT	08 DEC 70	392652			
5	CT	11 JAN 71	392653			
X REF TO INC INC NO						
ZZ220						
2600502						



VIEW ON AC BOX



VIEW ON FRONT OF FILE

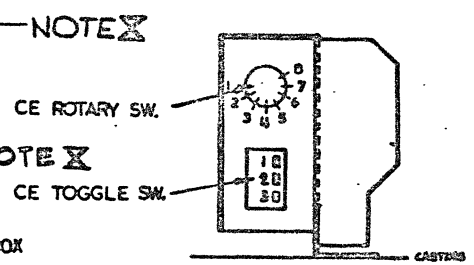


VIEW D-D

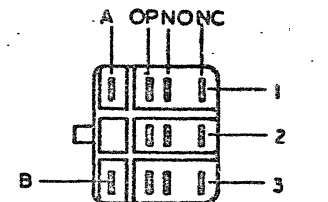


NOTE X

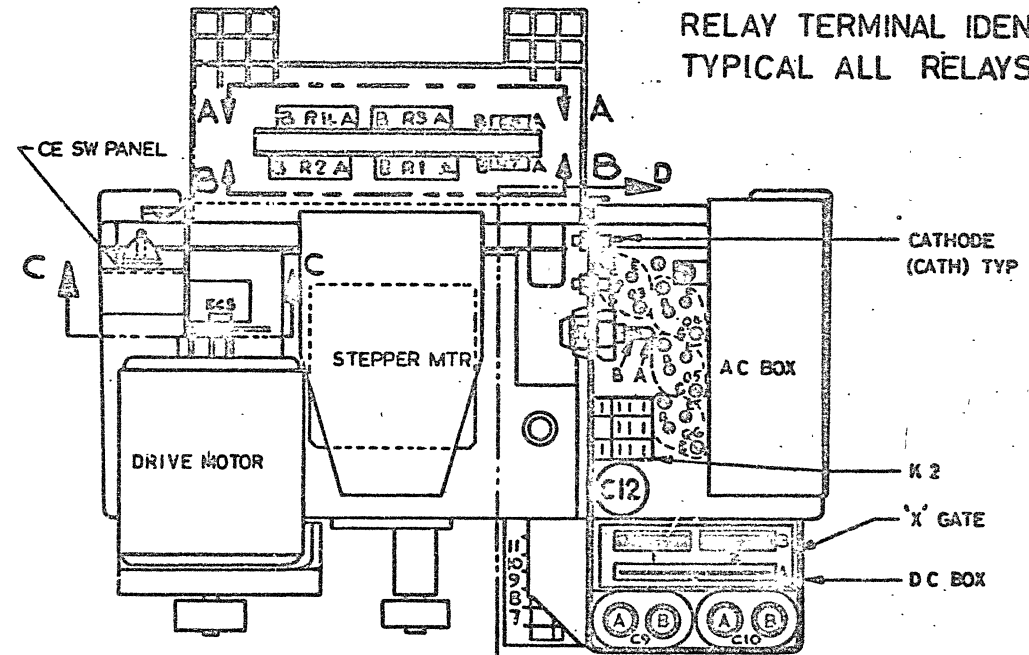
VIEW A-A



VIEW C-C



RELAY TERMINAL IDENT TYPICAL ALL RELAYS



VIEW ON REAR OF FILE



VIEW B-B

NOTES
 X COMPONENTS REQUIRED FOR HIGH SPEED ACCESS FEATURE ONLY
 XI COMPONENT R10 REQUIRED FOR 60 HZ MACHINES ONLY.

2600503

Z2230

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SYMBOL	DESCRIPTION	PART NO.	ASM. NO.	SYS. SHT. NO.
RESISTORS				
R1	30 OHM 50W	5724118		ZA230
R2	30 OHM 50W	5724118		ZA230
R3	8 OHM 50W	2274381		ZA230
R4	8 OHM 50W	2274381		ZA230
R5	20 OHM 10W	2283009	NOTE X	ZA230
R6	20 OHM 10W	2283009	NOTE X	ZA230
R7	20 OHM 10W	2283009	NOTE X	ZA230
R8	20 OHM 10W	2283009	NOTE X	ZA230
R10	150 OHM 25W	208249	NOTE XII	ZA200
CAPACITORS				
C1	2UF 440 VAC	2283004		ZA200
C2	.01UF 1000 VDC	2261918	2261919	ZA200
C3	.01UF 1000 VDC	2261918	2261919	ZA200
C4	.10UF 100 VDC	2192509		ZA210
C5	.10UF 100 VDC	2192509		ZA210
C6	.10UF 100 VDC	2192509		ZA210
C7	.10UF 100 VDC	2192509		ZA210
C8	.01UF 1000 VDC	2261918	2261919	ZA200
C9	5UF 330 VAC	5240458		ZA230
C10	5UF 330 VAC	5240458		ZA230
C11	.01UF 1000 VDC	2261918		ZA200
C12	250UF 70 VDC	254869	5144358	ZA210
C13	.10UF 100VDC	491320	738022	ZA220
RE1	.10UF 100V 100 OHM	288538		ZA200
DIODES				
CR1	STUD MTG	337512		ZA230
CR2	STUD MTG	337512		ZA230
CR3	STUD MTG	337512		ZA230
CR4	STUD MTG	337512		ZA230
CR5	STUD MTG	337512	NOTE XI	ZA230
CR6	SILICON REC.	5214094		ZA230
CR7	STUD MTG	337512	NOTE XI	ZA230
CR8	AM	2111232		ZA220
CR9	AM	2111232	210921	ZA220
CR10	AM	2111232	210921	ZA220
CR11	AM	2111232	210921	ZA220
CR12	AM	2111232	210921	ZA220
CR13	AM	2111232		ZA220
CR14	AM	2111232		ZA220
TRANSISTORS				
Q1	NPN 257	2414892		FS210
Q2	PNP 022	526898		FS210
Q3	369	2391819	NOTE XIII	ZA230
Q4	369	2391819	NOTE XIII	ZA230
Q5	369	2391819	NOTE XIII	ZA230
Q6	369	2391819	NOTE XIII	ZA230
Q7	369	2391819	NOTE XI	ZA230
Q8	369	2391819		ZA230
RESISTORS				
R5	11 OHM 10W	2395807	NOTE XI	ZA230
R6	11 OHM 10W	2395807	NOTE XI	ZA230
R7	11 OHM 10W	2395807	NOTE XI	ZA230
R8	11 OHM 10W	2395807	NOTE XI	ZA230
R9	3 OHM 25W	2396459	NOTE XI	ZA230

SYMBOL	DESCRIPTION	PART NO.	ASM. NO.	SYS. SHT. NO.
SWITCHES				
SW1	CE TOGGLE	2283005		FS300
SW2	CE ROTARY	2283002		FS300
PLUG				
P1	UPPER TRANSDUCER	725558		FS340
P2	LOWER TRANSDUCER	4121101		FS340
P3	STEP MTR.	569878		ZA230
P4	ENCODER	569878		FS350
P5	ACTUATOR	569878		ZA220
				FS350
P6	ACTUATOR	569878		ZA220
				FS350
SOCKETS				
J1	UPPER TRANSDUCER	725557		FS340
J2	LOWER TRANSDUCER	4121100		FS340
J3	STEP MOTOR	569879		ZA230
J4	ENCODER	569879		FS350
J5	ACTUATOR	569879		ZA220
				FS350
J6	ACTUATOR	569879		ZA220
				FS350
FUSES				
F1	2 AMP	855231	NOTE X	ZA210
F1	3 AMP	855252	NOTE XI	ZA210
SOLENOIDS				
L3	LEVER HOLD	2538003	2538020	ZA220
L4	CAM HOLD	2538003	2538001	ZA220
CHOKES				
L1	50 UH	2160804	2536337	ZA200
L2	50 UH	2160804	2536337	ZA200
LAMPS				
	CARRIAGE 1	369675		FS350
	CARRIAGE 2	369675		FS350
	ENCODER		2538047	FS350

NOTES: X COMPONENT NOT REQUIRED FOR HIGH SPEED ACCESS FEATURE.
 XI COMPONENT REQUIRED ONLY FOR HIGH SPEED ACCESS FEATURE.
 XII COMPONENT REQUIRED ONLY FOR 60HZ MCH.
 XIII SUBSTITUTE TRANSISTOR TYPE 957 P/N 2398138 FOR W.T. USE ONLY.

BEA 21551

INTERNATIONAL BUSINESS MACHINES CORP.				TECHNICAL APPROVAL		DEVELOPMENT NO.	
NAME	DATE	CHANGE NO.	DATE	CHANGE NO.	CIRCUIT AND PRG.		
SYS DIAG.	6 JUN 70	392621	6 APR 71	392671		Z2230	
	23 NOV 70	392649	17 DEC 71	392681			
	14 DEC 70	392655	21 JUL 72	392723			
	18 DEC 70	392652	9 AUG 72	392720A			
	26 JAN 71	392117					

2600503 - D4

2600504

ZZ240

TERMINAL BLOCKS.

TB NO.	RATING	PART NO.	SYSTEM SHEET NO.										
			1	2	3	4	5	6	7	8	9	10	11
1	15 AMP	317232	ZA200	ZA200	ZA200	ZA200	ZA200	ZA200	-	-	-	-	-
2	15 AMP	323837	ZA200	ZA200	ZA200	-	-	-	-	-	-	-	-
3	15 AMP	317310	ZA210	ZA210	ZA210	ZA210	ZA210	-	ZA210	ZA210	ZA210	SPARE	SPARE

RELAYS

SYMBOL	DESCRIPTION	PART NO.	SYSTEM SHEET NO.			
			COIL	1	2	3
K1	3PDT 24V DC	2283000	ZA220	ZA200	SPARE	SPARE
K2	3PDT 24V DC	2283000	ZA220	ZA210	ZA220	ZA220
K3	3PDT 24V DC	2283000	ZA220	ZA200	ZA200	ZA200
K5	3PDT 24V DC	2283000	ZA220	ZA200	SPARE	SPARE

TAPER PIN BLOCKS (EC'S)

EC NO	PIN	SYS. SHT. NO.
1	a	ZA220
1	b	ZA220
1	c	ZA220
1	d	ZA220
1	e	ZA220
1	f	SPARE
1	g	SPARE
1	h	SPARE
PART NO.		302090

EC NO	PIN	SYS. SHT. NO.
2	a	ZA220
2	b	ZA220
2	c	SPARE
2	d	ZA220
2	e	ZA220
2	f	ZA220
2	g	ZA220
2	h	ZA220
PART NO.		302090

EC NO	PIN	SYS. SHT. NO.
3	a	ZA220
3	b	ZA220
3	c	ZA220
3	d	ZA220
3	e	SPARE
3	f	ZA220
PART NO.		852958

EC NO.	PIN	SYS. SHT. NO.
4	a	SPARE
4	b	SPARE
4	c	ZA230
4	d	ZA230
4	e	ZA230
4	f	ZA230
4	g	ZA230
4	h	ZA230
PART NO.		302090

EC NO	PIN	SYS. SHT. NO.
5	a	ZA230
5	b	ZA230
5	c	ZA230
5	d	ZA230
5	e	ZA230
5	f	ZA230
5	g	ZA230
5	h	ZA230
PART NO.		302090

EC NO.	PIN	SYS. SHT. NO.
PART NO.		

RELAY AND TERMINAL ALLOCATION CHART

INTERNATIONAL BUSINESS MACHINES CORP.			DATE	CHANGE NO.	DATE	CHANGE NO.	TECHNICAL APPROVAL		DEVELOPMENT NO.
NAME: SYS DIAG			6 JUN 70	392621					ZZ 240
DESIGN	ROR	10 MAR 70	SCALE	29 SEP 70	392644				
DETAIL	JMC	12 MAR 70		18 DEC 70	392652				
CHECK	CT	13 MAR 70	STD'S CODE	1 JAN 71	392658				
APPRO	SET	17 APR 70							

2600504