1. CHECK ALL MATERIAL RECEIVED AGAINST SHIPPING CHECK OFF LIST CONTAINED IN SYSTEM INSTALLATION PARTS PACKAGE (THIS PACKAGE CONTAINS ALL DETACHABLE CABLES ETC).

2. REMOVE ALL SHIPPING TAPE, BRACES AND OTHER MATERIAL AS PER PACKING AND UNPACKING INSTRUCTIONS INCLUDED WITH EACH UNIT.

   AT THIS TIME MAKE A THOROUGH PHYSICAL CHECK FOR DAMAGED, BROKEN OR LOOSE PARTS RESULTING FROM SHIPMENT (INCLUDING EDGE CONNECTORS). CAUTION - TURN FEED OVER MANUALLY WHEN REINSERTING BRUSH ASSEMBLY TO PREVENT BRUSH DAMAGE.

3. INSTALL THE FILE FEED MAGAZINE ON THE 1402. (AS PER REVISED 1402 CE REFERENCE MANUAL). PLACE FILTERS IN 1401.

4. CHECK THE 1402 RELAY GATE FOR LOOSE RELAYS AND DISPLACED ARMATURES.

5. MANUALLY TRIP CLUTCHES AND FEED CARDS THROUGH THE READ AND PUNCH FEEDS. CHECK FOR BINDS.

6. CHECK ALL MANUAL KNOBS, LEVERS, AND COVERS ON THE 1403 FOR PROPER OPERATION.

7. INSTALL (2) ANTI-WALK FOOT COMPONENT PARTS (2 SETS) TO THE 1403 FRAME NEAR THE CASTERS BY THE FOLLOWING PROCEDURE:
   INSERT THE MOUNTING STUD IN THE MACHINE FRAME FOR ITS FULL THREADED LENGTH. ASSEMBLE THE FOOT COVER AND MOUNTING FOOT TO THE STUD. BACK THE MOUNTING STUD OFF FOR THE REQUIRED DISTANCE TO STABILIZE THE MACHINE.

8. 1403-CHECK FOR OIL IN THE HYDRAULIC RESERVIOR. APPROX LEVEL TO BOTTOM OF MAGNETS.

9. 1403-CHECK FOR OIL IN THE RESERVOIR AT THE RIGHT END OF THE "T" CASTING (IBM #6)-1403.

10. ALL 1401 MACHINES FROM SERIAL NUMBER 20890 AND UP WILL BE DESIGNED FOR CABLES TO EXIT UNDERNEATH THE MACHINE. THE MACHINE WILL BE SHIPPED WITH CABLES ABOVE FRAME AND SHOULD BE INSTALLED AS DESCRIBED BELOW:

    (A) AT 01B1-01B8 - REMOVE THROW AWAY COVER AND DISCARD

    (B) AT 01B1 - REMOVE COVER SUPPORT BRACKET (194370) AND RETAIN. OPEN GATE 01B1.

    (C) AT 01B8 - RUN ALL CABLES DOWN THROUGH THE OPENING AT 01B1-01B8. STARTING WITH CABLE NEAREST REAR OF MACHINE, PLACE A LOOP THROUGH THE OPENING SUCH THAT THE CABLE CONNECTOR GOES THROUGH LAST.

    (D) AT 01B1-01B8 -
        INSTALL HOUSING (723351).
        INSTALL FILTER (723354).
        INSTALL COVER SUPPORT BRACKET, (194370) REMOVED IN STEP B, AT THE CENTER OF THE FRAME.
        INSTALL COVER (194372).
        FOR RAISED FLOOR INSTALLATION INSTALL KICK PLATE (597329).
        FOR ABOVE FLOOR INSTALLATION INSTALL KICK PLATE (723359)
        CLOSE GATE 01B1.

    (E) AT 02B4-02B5 -
        REMOVE COVER (194372).
        OPEN GATE 02B4.
        CONNECT CABLES - FIRST PASSING THEM UP FROM UNDERNEATH FRAME.
        INSTALL HOUSING (723352).
        FOR ABOVE FLOOR INSTALLATIONS INSTALL CLAMP (723353) TO HOLD CABLES AT 02B5 SIDE OF MACHINE. THIS INCLUDES THE THREE 1403 CABLES IF THEY PASS UNDERNEATH THE LENGTH OF THE 1401.
        INSTALL FILTER (723354).
        FOR ABOVE - FLOOR INSTALLATIONS INSTALL KICK PLATE (723360).
        FOR RAISED FLOOR INSTALLATIONS INSTALL KICK PLATE (597329).
        INSTALL COVER (194372).
        CLOSE GATE 02B4.

11. CONNECT CABLES FROM THE 1401 TO THE 1402. (WILL ONLY FIT ONE WAY).

12. CONNECT CABLES FROM THE 1401 TO THE 1403. (SHOE WITH GOLD PLATED PINS CONNECTS TO FRONT RECEPTACLE. ON CURRENT MACHINES THESE WILL ONLY FIT ONE WAY).

12A. IF SYSTEM HAS EXPANDED MEMORY, CONNECT POWER AND SIGNAL CABLES FROM 1401 TO THE 1406 (06B7) (WILL ONLY FIT ONE WAY AFTER 1401-20010).

13. CONNECT THE MAIN POWER CABLE TO THE UPPER TERMINALS ON THE INNER CIRCUIT BREAKER OF THE 1402 UNIT. THE GREEN (GROUND) WIRE SHOULD BE CONNECTED TO THE FRAME OF THE 1402. REFER TO 1402 WIRING DIAGRAM #609400, PAGE 11.01.11.1. ON SYSTEMS WITHOUT THE 1402 THE MAIN POWER CABLE WILL BE CONNECTED TO THE 1401 AT THE BULK POWER SUPPLY AT GATE LOCATIONS 02B7 AND 02B8. REFER TO 1401 POWER SUPPLY DIAGRAM. (BE SURE TO TIGHTEN ALL TERMINAL SCREWS FIRMLY).

14. DO NOT CONNECT TAPE UNIT CABLES AT THIS TIME.

15. CHECK CUSTOMERS POWER RECEPTACLE FOR THE PROPER TYPE OF VOLTAGE SUPPLY AND GROUND. IF IT IS NECESSARY TO CHANGE THE SYSTEM FROM 208V TO 230V COMPLETE THE FOLLOWING:

    1401

    (A) EXPANDED BULK REGULATOR (ALL MODELS EXCEPT A)
        GATE 02A3 - MOVE WIRE OR WIRES ON BULK REGULATOR TB-4 TO TB-5.

    (B) 1250 WATT REGULATOR. LOCATED IN THE LEFT SIDE OF THE 1402. ON MODEL D SYSTEMS LOCATED ON GATE 02A7. MOVE THE WIRE ON THE 1250 WATT REGULATOR TB-4 TO TB-5.

DATE	EC NO	DATE	EC NO	DATE	EC NO
12-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	11030IE				
11-20-61	113401				

(C) 115V AC ISOLATION TRANSFORMER. LOCATED BEHIND THE RELAY PANEL ASSEMBLY
IN THE 1402. ON MODEL D SYSTEMS LOCATED IN 02B7-8 GATE AREA. REMOVE
THE WIRE ON THE TRANSFORMER SOLDER TERMINAL 6 AND SOLDER TO TERMINAL 7.
ON LATER MODEL D MACHINES TERMINAL 7 IS WIRED TO TERMINAL POSITION 7 OF
THE 8 POSITION BLOCK NEAR THIS TRANSFORMER. ON THESE MACHINES REMOVE
THE WIRE ON TERMINAL POSITION 6 OF THIS BLOCK AND INSTALL ON TERMINAL 7.

(D) 24V AC STEP DOWN TRANSFORMER. LOCATED IN THE 1402 BEHIND THE FUSE
PANEL. (DOES NOT EXIST ON SYSTEMS BELOW 20000) ON MODEL D SYSTEMS
LOCATED IN 02B7-8 GATE AREA. REMOVE THE WIRE ON STEP DOWN TRANSFORMER
TB POSITION 2 AND INSTALL ON TB POSITION 3.

(E) -60V AT 10 AMP OR -60V AT 20 AMP SUPPLY. LOCATED IN THE BACK OF THE
1402. ON MODEL D MACHINES LOCATED IN GATE AREA 01B4. REMOVE WIRE
FROM VR1-4 AND INSTALL ON VR1-5. (VR1 IS THE 12 POSITION TERMINAL
BLOCK LOCATED TO THE BOTTOM OF THIS UNIT.)

(F) 3V MARGINAL CHECK SUPPLY. (EXCEPT PORTABLE SUPPLIES) LOCATED IN THE
LEFT END OF THE 1402. LOCATED IN GATE 02A8 ON MODEL D. REMOVE WIRE ON
MC POWER SUPPLY POSITION VR1-4 AND INSTALL ON POSITION VR1-5. (THIS
WIRING CHANGE IS MADE INTERNALLY OF THE SUPPLY ASSEMBLY DIRECTLY ON THE
TRANSFORMER.)

1406

(A) 415 WATT REGULATOR IN 1406 GATE 06B8. (NOT ON EARLIER SYSTEMS) REMOVE
WIRE FROM TB POSITION 4 AND INSTALL ON TB POSITION 5.

1403

(A) ONLY THE CHAIN MOTOR IS AFFECTED. WIRE TB7 AS PER WIRING DIAGRAM
PAGE 01.09.1.

1405

(A) CHANGE TRANSFORMER TAPS FOR 3 TRANSFORMERS AS SHOWN ON LOGIC PAGES
75.58.11 AND 75.58.21.

1407

(A) NO CHANGE REQUIRED.

7330

(A) CHANGE LEAD GOING TO CONNECTION 2 TO CONNECTION 3 ON TRANSFORMER 556643
IN POWER SUPPLY 556810, GATE A8.

(B) CHANGE LEAD GOING TO TB-4 TO TB-5 ON TRANSFORMER 556920 IN POWER SUPPLY
556810, GATE A8.

(C) CHANGE LEAD GOING TO TB2-10 TO TB2-9 IN POWER SUPPLY 556751, GATE A5.

729

(A) ADD FB 352075. THIS BILL INCLUDES A 230V TO 208V STEP DOWN TRANSFORMER.

15B. IF IT IS NECESSARY TO CHANGE THE SYSTEM FROM 230V TO 208V REVERSE THE
INSTRUCTIONS IN STEP 15 ABOVE.

15C. IF A VOLTAGE CHANGE IS MADE ON THE SYSTEM ENTER AN MES ORDER SO THAT RECORDS
WILL BE PROPERLY UPDATED.

16. LIFT CARRIAGE BRUSHES AND OPEN "T" CASTING ON THE 1403 BEFORE APPLYING POWER.

17. APPLY POWER. CHECK ALL BLOWERS FOR OPERATION ON THE 1401 (AND 1406) ESPECIALLY
THE ONE OVER THE CORE STORAGE UNITS. ALSO CHECK THE CARRIAGE BLOWER ON THE RIGHT
SIDE OF THE 1403. PLACE A CARD OVER THE LOUVERS IN THIS COVER. IF THE CARD IS
DRAWN AGAINST THE COVER, THE BLOWER IS OPERATING.

18. CHECK FOR PROPER PHASE ROTATION ON THE 1403. SLIP A PIECE OF PAPER OR TAB CARD
THROUGH THE PAPER FEED ROLLERS ON THE BACK OF THE MACHINE. THE PAPER OR CARD
SHOULD BE FED DOWN. IF THIS IS CORRECT CLOSE THE "T" CASTING AND CHECK TO SEE
THAT THE CHAIN IS TURNING COUNTER CLOCKWISE, LOOKING DOWN AT IT. FINALLY CHECK
TO SEE THAT AIR IS BLOWING INTO THE HAMMER UNIT. THIS CHECK CAN BE MADE BY
PLACING A CARD OVER THE LOUVERS IN THE COVER ON THE LEFT SIDE OF THE 1403. IF
THE CARD IS DRAWN AGAINST THE COVER, AIR IS BEING BLOWN INTO THE MACHINE.
COMPLETE THE CHECK BY FEELING THAT AIR IS BEING BLOWN OUT OF THE HAMMER UNIT
AT THE SIDES OF THE UNIT. IF ALL THREE OF THE ABOVE ARE INCORRECT REVERSE ANY
TWO LEADS ON THE MAIN POWER CABLE. IF ONE OR TWO ARE INCORRECT FOLLOW PROCEDURE
OUTLINED IN THE 1403 REFERENCE MANUAL PAGE 6, FORM #225-6493.

19. IF ALL PHASING IS CORRECT IT IS NOW SAFE TO LOWER CARRIAGE BRUSHES. A
CARRIAGE TAPE SHOULD BE INSTALLED.

20. CHECK 1401, 1402 (AND 1406) POWER SUPPLY VOLTAGES. THEY SHOULD BE ±2% WHEN
MEASURED AS DESCRIBED BELOW

(A) MEASURE -6V, +6V, AND -12 VOLT OUTPUT AT GATE LOCATION 01B3.
ADJUST FOR PROPER OUTPUT. ALWAYS ADJUST -6V BEFORE ADJUSTING -12V.
SEE 1401 WIRING DIAGRAM FOR LOCATION OF SUPPLIES LOCATED ON 02A4
AND 02A5 (1401 ONLY).

(B) MEASURE -6V, +6V, -12V, AND -36 VOLTS (IF THERE ARE NO TAPE
ADAPTER UNIT GATES OR IF MACHINE IS EQUIPPED WITH TAU 9 -36V IS
NOT PRESENT). AT GATE LOCATION 02B2 ON MACHINES WITH TAPES.
IF THIS FEATURE IS NOT PRESENT, MEASURE AT GATE LOCATION 02A7, 02A8
OR 02B6 DEPENDING ON WHICH MAY BE PRESENT. ADJUST FOR PROPER
OUTPUT FROM THE SUPPLIES WHICH ARE LOCATED ON 02A3 AND 02A6. ALWAYS
ADJUST -6V BEFORE ADJUSTING -12V. REFER TO 1401 WIRING DIAGRAM.
(1401 ONLY).

(C) MEASURE -60 VOLTS ON 01B8 AT THE -60 VOLT BUS BAR. ADJUST FOR THE
PROPER OUTPUT FROM THE SUPPLY LOCATED IN THE 1402. IN MODEL D
THIS SUPPLY IS LOCATED ON 01B4 (1401 ONLY).

DATE	EC NO	DATE	EC NO	DATE	EC NO
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8-28-61	110301E				
11-20-61	113401				

(D) MEASURE -20 VOLTS ON 01A1 AT F26R AND ADJUST FOR PROPER OUTPUT FROM
THE SUPPLY LOCATED IN THE 1402. IN MODEL D SUPPLY IS LOCATED ON
GATE 02A8. (TURN OFF ALL POWER-INCLUDING LINE POWER INPUT TO 1402-
AND MOVE TAPS ON SUPPLY IF ADJUSTMENT IS NECESSARY).

(E) MEASURE +30 VOLTS ON 01A1 (AND 1406 CORE ARRAY GATES) AT F26H. MEASURE
+12V FIXED ON 01A1 (AND 1406 CORE ARRAY GATES) AT F26Q.
MEASURE +12V VARIABLE (18V DIFF) ON 01A1 (AND 1406 CORE ARRAY GATES)
AT F13Q. ALWAYS ADJUST +30V BEFORE ADJUSTING +12 V. OPTIMUM VOLTAGE FOR
THE +12 IS NOTED ON DECALS FOR EACH CORE ARRAY.

(F) THE MARGINAL VOLTAGES ARE NOT MEASURED. (IF THE ABOVE STEPS ARE
FOLLOWED, THESE VOLTAGES SHOULD BE WITHIN TOLERANCES).

(G) ON LATER MACHINES THE MARGINAL VOLTAGE SUPPLY WILL NOT BE PERMANENTLY
INSTALLED IN THE SYSTEM. A PORTABLE SUPPLY WILL BE MADE AVAILABLE.
THIS WILL PROVIDE GREATER FLEXIBILITY FOR CHECKING THE SYSTEM
INCLUDING ANY PERIPHERAL EQUIPMENT. A SPACE FOR STORAGE OF THE
PORTABLE SUPPLY IS AVAILABLE IN THE LEFT END OF THE 1402 DIRECTLY
UNDER THE PUNCH DRIVE MOTOR. THE PORTABLE SUPPLY CAN BE PLUGGED INTO
ANY 115V RECEPTACLE AND IS USED THE SAME AS THE FIXED MARGINAL SUPPLY.

21. RUN READER AND PUNCH WITH NON-PROCESS RUNOUT KEY.

22. RUN READ WITH PROCESS UNIT. (PUT IN READ OP MANUALLY).

23. RUN PUNCH WITH PROCESS UNIT.

24. RUN PRINTER WITH PROCESS UNIT WITH NO INFORMATION IN THE PRINT AREA.

25A. IF THE 1401 IS A STAGE I, PROCEED NEXT TO STEP 26.

B. IF THE 1401 IS A STAGE II, SKIP STEP 26 AND PROCEED NEXT TO STEP 27.

26. TEST RESET CHECK CIRCUIT AS FOLLOWS:

(A) CLEAR THE ENTIRE PRINT AREA AND EXECUTE A PRINT OPERATION WITH
THE SCOPE SYNC ON C17N +U NOT FIRST SCAN GOING PLUS ON 36.35.11.1
(01A6).

(B) SCOPE B03N AND B04N ON GATE 01B5, LOGIC 36.37.51.1 SHOULD GO TO
+T WHEN NOT PRINTING AND -T WHEN PRINTING. SCOPE D03H, G AND D04G
LOGIC 36.37.41.1 AND C04H, G AND D04H LOGIC 36.39.91.1 THEY SHOULD
BE AT +T WHEN NOT PRINTING. WHEN PRINTING, THEY WILL GO +T IN THE
HALF OF A SUBSCAN JUST PRIOR TO THE TIME 1/6 OF THE HAMMERS MAY
BE OPTIONED TO PRINT (SIX RESETS PER PRINT SCAN).

(C) SCOPE PIN E OF TRIGGER IN E21 ON 01B5, LOGIC 36.37.51.1 SHOULD
TURN ON (GO TO +U) 110 USEC AFTER SYNC GOES POSITIVE. SHOULD TURN
OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY
555 USEC WHILE PRINTING.

(D) SCOPE PIN E OF TRIGGER IN F20 ON 01B5, LOGIC 36.37.51.1 SHOULD TURN
ON (GO TO +U) 190 USEC AFTER SYNC GOES POSITIVE. SHOULD TURN
OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY
555 USEC WHILE PRINTING.

(E) IF ABOVE TRIGGERS ARE OPERATING PROPERLY, PROCEED TO STEP F. IF NOT,
THE HAMMER DRIVER RESETS ARE NOT WORKING PROPERLY. CHECK LOGIC ON
36.37.41.1 TO GET RESETS WORKING PROPERLY. THEN REPEAT STEPS C AND D
THEN PROCEED TO F IF C AND D ARE O.K.

(F) SCOPE PIN G OF F02 ON 01B5 (LOGIC 36.37.51.1) FOR THE FOLLOWING
STEPS.

(G) BEING VERY CAREFUL, TIE PIN E OF TRIGGER IN E21 TO "GROUND" WITH CLIP
LEAD. THIS CHECKS LOGIC BLOCK 4B ON 36.37.51.1, AND PIN G OF F02 ON
01B5 SHOULD GO TO +U AND STAY THERE BECAUSE THE RESET CHECK LATCH
HAS BEEN "SET" WHICH WILL HOLD ALL THE HAMMER DRIVERS RESET. AFTER
REMOVING CLIP LEAD, RESET THE LATCH WITH THE I-O CHECK RESET SWITCH.

(H) TIE E21H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4C AND
RESULT SHOULD BE AS FOR STEP G. RESET LATCH AS FOR STEP G.

(I) TIE F20E TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4D AND
RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

(J) TIE F20H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4E
AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

(K) A WITH PRINT STORAGE - TIE E20B TO "GROUND" WITH CLIP LEAD.
        THIS CHECKS LOGIC BLOCKS 3F AND 4F AND RESULT SHOULD BE THE
        SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

     B WITHOUT PRINT STORAGE - TIE F15B TO "GROUND" WITH CLIP LEAD
        WHILE EXECUTING A PRINT OPERATION. THIS CHECKS LOGIC BLOCK
        2G AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH
        AS FOR STEP G.

(L) A WITH PRINT STORAGE - OPEN T-FRAME ON 1403 WHILE EXECUTING THE
        ABOVE PRINT OPERATION WITH THE PRINT AREA CLEAR. THIS CHECKS
        LOGIC BLOCKS 5J AND 6J ON LOGIC 36.31.01.1 (GATE 01A6). RESULT
        SHOULD BE THE SAME AS FOR STEP G. RESET THE LATCH WITH THE I-O
        CHECK RESET SWITCH.

     B WITHOUT PRINT STORAGE - OPEN T-FRAME ON 1403 WHILE EXECUTING THE
        ABOVE PRINT OPERATION WITH THE PRINT AREA CLEAR. THIS CHECKS
        LOGIC BLOCKS 4J, 5J, AND 6J ON LOGIC 36.31.01.1 (GATE 01A6) AND
        RESULT SHOULD BE THE SAME AS FOR STEP G. RESET THE LATCH WITH
        THE I-O CHECK RESET SWITCH.

(M) TRY TO PRINT IN ONE POSITION ONLY. IF O.K., EXPAND THE PRINT FIELD.
AFTER PRINTING IN ALL POSITIONS CHECK TO SEE THAT THE -60V HAMMER
RESPONSE COMMON FUSES (2) ARE NOT BLOWN. IF FUSES HAVE BLOWN AND
BLOW A SECOND TIME, CHECK FOR GROUNDS ON THE HAMMER RESPONSE LINES.

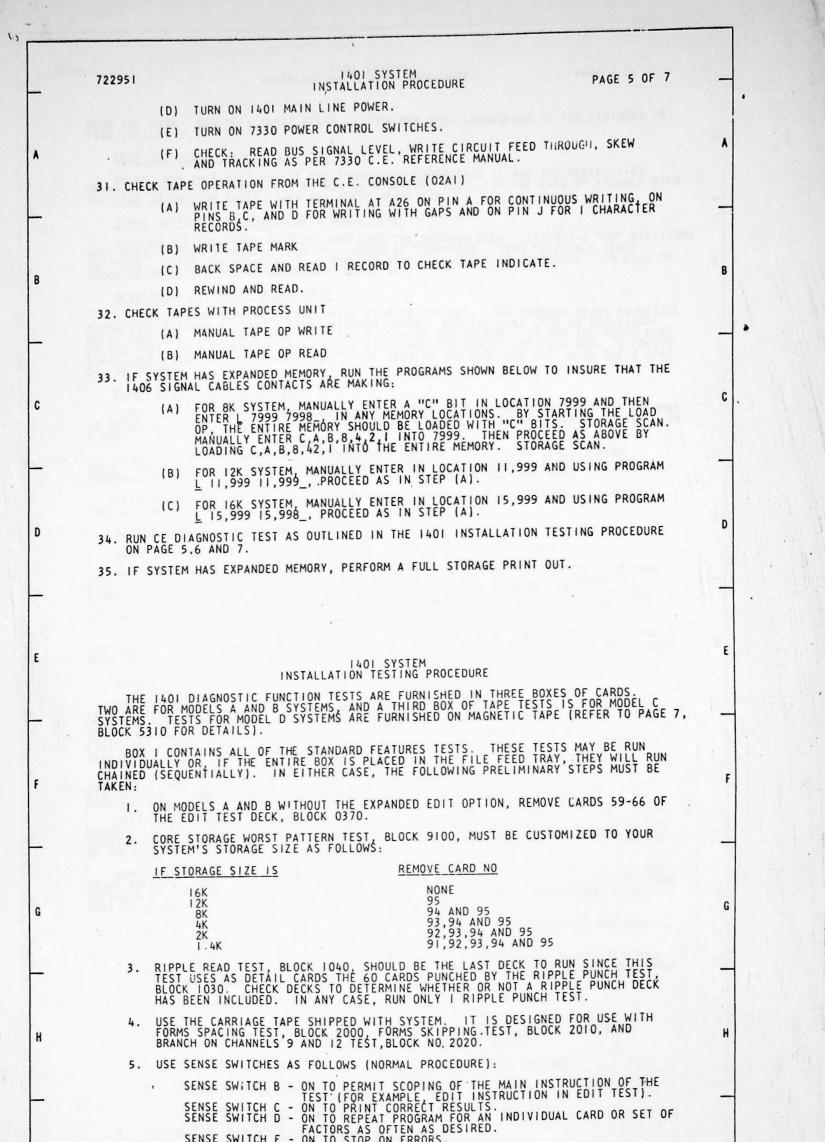| DATE	EC NO	DATE	EC NO	DATE	EC NO
2-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	110301E				
11-20-61	113401				

(N) PROCEED NEXT TO STEP 28.

27. TEST RESET CHECK CIRCUIT AS FOLLOWS:

(A) CLEAR THE ENTIRE PRINT AREA AND EXECUTE A PRINT OPERATION WITH THE SCOPE SYNC ON C1IN -T NOT FIRST SCAN GOING NEGATIVE ON 36.35.11.2(01A6).

(B) SCOPE B03N AND B04N ON GATE 01B5, LOGIC 36.37.51.2 SHOULD GO TO +T WHEN NOT PRINTING AND -T WHEN PRINTING. SCOPE D03H, G AND D04G LOGIC 36.37.41.2 AND C04H, G AND D04H LOGIC 36.39.91.2. THEY SHOULD BE AT +T WHEN NOT PRINTING. WHEN PRINTING, THEY WILL GO +T IN THE HALF OF A SUBSCAN JUST PRIOR TO THE TIME 1/6 OF THE HAMMERS MAY BE OPTIONED TO PRINT (SIX RESETS PER PRINT SCAN).

(C) SCOPE PIN E OF TRIGGER IN E21 ON 01B5, LOGIC 36.37.51.2 SHOULD TURN ON (GO TO +U)110 USEC AFTER SYNC GOES NEGATIVE. SHOULD TURN OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY 555 USEC WHILE PRINTING.

(D) SCOPE PIN E OF TRIGGER IN F20 ON 01B5, LOGIC 36.37.51.2 SHOULD TURN ON (GO TO +U) 190 USEC AFTER SYNC GOES NEGATIVE. SHOULD TURN OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY 555 USEC WHILE PRINTING.

(E) IF ABOVE TRIGGERS ARE OPERATING PROPERLY, PROCEED TO STEP F. IF NOT THE HAMMER DRIVER RESETS ARE NOT WORKING PROPERLY. CHECK LOGIC ON 36.37.41.2 TO GET RESETS WORKING PROPERLY. THEN REPEAT STEPS C AND D. THEN PROCEED TO F IF C AND D ARE O.K.

(F) SCOPE PIN G OF F02 ON 01B5 (LOGIC 36.37.51.2) FOR THE FOLLOWING STEPS.

(G) BEING VERY CAREFUL, TIE PIN E OF TRIGGER IN E21 TO "GROUND" WITH CLIP LEAD. THIS CHECKS BLOCK 4B AND 36.37.51.2 AND PIN G OF F02 ON 01B5 SHOULD GO TO +U AND STAY THERE BECAUSE THE RESET CHECK LATCH HAS BEEN "SET" WHICH WILL HOLD ALL THE HAMMER DRIVERS RESET. AFTER REMOVING CLIP LEAD, RESET THE LATCH WITH THE I-0 CHECK RESET SWITCH.

(H) TIE E21H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4C AND RESULT SHOULD BE AS FOR STEP G. RESET LATCH AS FOR STEP G.

(I) TIE F20E TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4D AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

(J) TIE F20H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4E AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

(K) A WITH PRINT STORAGE - TIE E20B TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCKS 3F AND 4F AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

B WITHOUT PRINT STORAGE - TIE F15B TO "GROUND" WITH CLIP LEAD WHILE EXECUTING A PRINT OPERATION. THIS CHECKS LOGIC BLOCK 2G AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

(L) A WITH PRINT STORAGE - OPEN T-FRAME ON 1403 WHILE EXECUTING THE ABOVE PRINT OPERATION WITH THE PRINT AREA CLEAR. THIS CHECKS BLOCK 6G (OR 6F) LOGIC 36.31.11.2 (GATE 01A6) AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET THE LATCH WITH THE I-0 CHECK RESET SWITCH.

B WITHOUT PRINT STORAGE - OPEN T-FRAME ON 1403 WHILE EXECUTING THE ABOVE PRINT OPERATION WITH THE PRINT AREA CLEAR. THIS CHECKS LOGIC BLOCK 6G ON LOGIC 36.31.11.2 (GATE 01A6) AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET THE LATCH WITH THE I-0 CHECK RESET SWITCH.

(M) TRY TO PRINT IN ONE POSITION ONLY. IF O.K., EXPAND THE PRINT FIELD. AFTER PRINTING IN ALL POSITIONS CHECK TO SEE THAT THE -60V HAMMER RESPONSE COMMON FUSES (2) ARE NOT BLOWN. IF FUSES HAVE BLOWN AND BLOW A SECOND TIME, CHECK FOR GROUNDS ON THE HAMMER RESPONSE LINES.

28. RUN COMBINATION OP CODES 3,5,6 AND 7.

29. REMOVE POWER AND INSTALL TAPE UNIT CABLES.

(A) FOR C,D AND F SYSTEMS - WHEN 729 AND 7330 TAPE UNITS ARE INTERMIXED, CABLES CANNOT BE CROSS CONNECTED. I.E. EACH END OF ANY TAPE CABLE MUST CONNECT TO THE SAME TYPE TAPE UNIT ON EITHER END. THE FIRST TAPE UNIT IN THE SYSTEM MUST ALSO BE CONNECTED TO THE PROPER CONNECTOR IN THE PROCESSING UNIT. AFTER THE INITIAL CABLE HOOKUP HAS BEEN MADE AND CHECKED OUT, THE CONNECTORS ON EACH END OF THE CABLES MUST BE IDENTIFIED WITH "729" OR "7330" LABELS PROVIDED IN THE SYSTEM MAINTENANCE PACKAGE FOR THIS PURPOSE.

30. IF SYSTEM HAS TYPE 729 TAPE DRIVES APPLY POWER AND CHECK ROTATION OF MOTORS BY HITTING LOAD REWIND. IF THE HEAD DOES NOT COME DOWN, CHECK FOR VACUUM IN COLUMNS. IF AIR IS BLOWING OUT, THE PHASING IS REVERSED. IF AIR IS BEING SUCKED IN, PHASING IS CORRECT AND SOMETHING ELSE IS PREVENTING THE HEAD FROM COMING DOWN. IF ROTATION IS INCORRECT, TURN OFF ALL POWER TO SYSTEM (LINE POWER INCLUDED) AND REVERSE ANY TWO PHASES AT CIRCUIT BREAKER #2 IN THE 1402 (REFER TO 1402 LOGICS FOR DIAGRAM- SEC 1A).
NOTE: ON MOD D SYSTEMS, CIRCUIT BREAKER IS LOCATED 02B8. TURN POWER ON AND RECHECK ROTATION.

30A. IF SYSTEM HAS TYPE 7330 TAPE DRIVES:

(A) CLEAN TRANSPORT AND CHAMBER.

(B) CHECK 7330 POWER CONTROL SWITCHES OFF.

(C) INSTALL TERMINATOR SHOE.
CAUTION: DO NOT, AT ANY TIME, TURN POWER ON WITHOUT A TERMINATOR SHOE INSTALLED.

DATE	EC NO	DATE	EC NO	DATE	EC NO
12-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	11030IE				
11-20-61	113401				

(D) TURN ON 1401 MAIN LINE POWER.

(E) TURN ON 7330 POWER CONTROL SWITCHES.

(F) CHECK: READ BUS SIGNAL LEVEL, WRITE CIRCUIT FEED THROUGH, SKEW AND TRACKING AS PER 7330 C.E. REFERENCE MANUAL.

31. CHECK TAPE OPERATION FROM THE C.E. CONSOLE (02A1)

(A) WRITE TAPE WITH TERMINAL AT A26 ON PIN A FOR CONTINUOUS WRITING, ON PINS B,C, AND D FOR WRITING WITH GAPS AND ON PIN J FOR 1 CHARACTER RECORDS.

(B) WRITE TAPE MARK

(C) BACK SPACE AND READ 1 RECORD TO CHECK TAPE INDICATE.

(D) REWIND AND READ.

32. CHECK TAPES WITH PROCESS UNIT

(A) MANUAL TAPE OP WRITE

(B) MANUAL TAPE OP READ

33. IF SYSTEM HAS EXPANDED MEMORY, RUN THE PROGRAMS SHOWN BELOW TO INSURE THAT THE 1406 SIGNAL CABLES CONTACTS ARE MAKING:

(A) FOR 8K SYSTEM, MANUALLY ENTER A "C" BIT IN LOCATION 7999 AND THEN ENTER L 7999 7998_ IN ANY MEMORY LOCATIONS. BY STARTING THE LOAD OP, THE ENTIRE MEMORY SHOULD BE LOADED WITH "C" BITS. STORAGE SCAN. MANUALLY ENTER C,A,B,8,4,2,1 INTO 7999. THEN PROCEED AS ABOVE BY LOADING C,A,B,8,42,1 INTO THE ENTIRE MEMORY. STORAGE SCAN.

(B) FOR 12K SYSTEM, MANUALLY ENTER IN LOCATION 11,999 AND USING PROGRAM L 11,999 11,999_, PROCEED AS IN STEP (A).

(C) FOR 16K SYSTEM, MANUALLY ENTER IN LOCATION 15,999 AND USING PROGRAM L 15,999 15,998_, PROCEED AS IN STEP (A).

34. RUN CE DIAGNOSTIC TEST AS OUTLINED IN THE 1401 INSTALLATION TESTING PROCEDURE ON PAGE 5,6 AND 7.

35. IF SYSTEM HAS EXPANDED MEMORY, PERFORM A FULL STORAGE PRINT OUT.

1401 SYSTEM
INSTALLATION TESTING PROCEDURE

THE 1401 DIAGNOSTIC FUNCTION TESTS ARE FURNISHED IN THREE BOXES OF CARDS. TWO ARE FOR MODELS A AND B SYSTEMS, AND A THIRD BOX OF TAPE TESTS IS FOR MODEL C SYSTEMS. TESTS FOR MODEL D SYSTEMS ARE FURNISHED ON MAGNETIC TAPE (REFER TO PAGE 7, BLOCK 5310 FOR DETAILS).

BOX 1 CONTAINS ALL OF THE STANDARD FEATURES TESTS. THESE TESTS MAY BE RUN INDIVIDUALLY OR, IF THE ENTIRE BOX IS PLACED IN THE FILE FEED TRAY, THEY WILL RUN CHAINED (SEQUENTIALLY). IN EITHER CASE, THE FOLLOWING PRELIMINARY STEPS MUST BE TAKEN:

1. ON MODELS A AND B WITHOUT THE EXPANDED EDIT OPTION, REMOVE CARDS 59-66 OF THE EDIT TEST DECK, BLOCK 0370.

2. CORE STORAGE WORST PATTERN TEST, BLOCK 9100, MUST BE CUSTOMIZED TO YOUR SYSTEM'S STORAGE SIZE AS FOLLOWS:

IF STORAGE SIZE IS	REMOVE CARD NO
16K	NONE
12K	95
8K	94 AND 95
4K	93,94 AND 95
2K	92,93,94 AND 95
1.4K	91,92,93,94 AND 95

3. RIPPLE READ TEST, BLOCK 1040, SHOULD BE THE LAST DECK TO RUN SINCE THIS TEST USES AS DETAIL CARDS THE 60 CARDS PUNCHED BY THE RIPPLE PUNCH TEST, BLOCK 1030. CHECK DECKS TO DETERMINE WHETHER OR NOT A RIPPLE PUNCH DECK HAS BEEN INCLUDED. IN ANY CASE, RUN ONLY 1 RIPPLE PUNCH TEST.

4. USE THE CARRIAGE TAPE SHIPPED WITH SYSTEM. IT IS DESIGNED FOR USE WITH FORMS SPACING TEST, BLOCK 2000, FORMS SKIPPING TEST, BLOCK 2010, AND BRANCH ON CHANNELS 9 AND 12 TEST, BLOCK NO. 2020.

5. USE SENSE SWITCHES AS FOLLOWS (NORMAL PROCEDURE):

SENSE SWITCH B - ON TO PERMIT SCOPING OF THE MAIN INSTRUCTION OF THE TEST (FOR EXAMPLE, EDIT INSTRUCTION IN EDIT TEST).
SENSE SWITCH C - ON TO PRINT CORRECT RESULTS.
SENSE SWITCH D - ON TO REPEAT PROGRAM FOR AN INDIVIDUAL CARD OR SET OF FACTORS AS OFTEN AS DESIRED.
SENSE SWITCH E - ON TO STOP ON ERRORS.
OFF TO PRINT ERROR RESULTS.

6. IF TITLE AND HEADINGS PRINTOUT IS DESIRED, MANUALLY ENTER "1" IN 1252.

7. THERE MUST NOT BE A GROUP MARK IN 1398 WHEN RUNNING THE TESTS FROM CARDS.

8. IF ERROR PRINTOUTS OR STOPS OCCUR REFER TO THE DETAILED WRITE-UP OF THAT TEST.

BOX 2 CONTAINS OPTIONAL FEATURES TESTS WITH THE EXCEPTION OF BLOCKS 0001, 0002,

DATE	EC NO	DATE	EC NO	DATE	EC NO
12-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	110301E				
11-28-61	113401				

9000 AND 9999. RUN ONLY THOSE TESTS IN THIS BOX THAT CORRESPOND TO THE FEATURES IN YOUR SYSTEM.

MOVE AND LOAD - BLOCKS 0001 AND 0002

DO NOT RUN THIS TEST UNLESS YOU THOROUGHLY UNDERSTAND IT AND THE DESCRIPTION OF IT. THESE TESTS SHOULD NOT BE RUN AS A GENERAL TEST. IN THE CASE OF TROUBLE WITH THE LOAD OR MOVE OP CODES, THEY MAY PROVE BENEFICIAL.

SENSE SWITCHES (B THROUGH G) - BLOCK 0003

TURN ON ALL THE SENSE SWITCHES AND LOAD THE PROGRAM DECK. AFTER THE "ON" POSITIONS HAVE BEEN TESTED, A PROGRAM STOP WILL OCCUR (I STAR=700). TURN "OFF" ALL SENSE SWITCHES. PRESS THE START KEY. A PROGRAM STOP WILL OCCUR (I STAR=900). IN CASE OF ERROR PRINT OUT, REFER TO DIAGNOSTIC WRITE UP.

READ-PUNCH RELEASE - BLOCK 3500

I/O CHECK STOP SWITCH OFF AND CHECK STOP SWITCH OFF. THE PROGRAM READS 50 DETAIL CARDS WITH MAXIMUM ALLOWABLE DELAY BETWEEN CARDS. FOR THE LAST CARD AN ADDITIONAL DELAY FORCES A READ CHECK STOP WITH THE I STAR AT 599 OR 600. TO RUN THE PUNCH PART OF THE TEST, DO A NONPROCESS RUNOUT AND START THE PROGRAM AT LOCATION 600. A FORCED PUNCH CHECK STOP IN THIS PROGRAM STOPS THE MACHINE AND ENDS THE TEST WITH THE I STAR AT 799 OR 800.

PUNCH FEED READ - BLOCK 3600

TURN I/O AND CHECK STOP SWITCHES ON, ALL SENSE SWITCHES OFF, AND LOAD THE PROGRAM. 80 CARDS WILL BE PUNCHED WITH THE NORMAL PUNCH OP CODE AND THE PROGRAM WILL STOP WITH I STAR = 500.

LOAD THE PUNCHED CARDS BACK IN THE PUNCH HOPPER WITH 2 BLANK CARDS BEHIND THEM. PRESS THE START KEY. THE PROGRAM THEN READS THESE CARDS, TRANSPOSES THE INFORMATION IN COL 1-40 AND 41-80 AND PUNCHES IT BACK IN THE SAME CARD.

READ ERRORS WILL BE INDICATED BY AN ERROR PRINTOUT. PUNCH ERRORS WILL STOP THE MACHINE.

SELECT STACKER - BLOCK 9000

SET THE CHECK STOP SWITCHES AND SENSE SWITCH A "ON" CLEAR PUNCH FEED.

THE PUNCH IN COLUMN I OF EACH DETAIL CARD INDICATES INTO WHICH POCKET THE CARD WILL SORT. AFTER THE LAST CARD IN THE READ FEED HAS BEEN SENSED, THE PUNCH WILL START AND CARDS WILL BE SELECTED INTO EACH OF THE POCKETS FROM THE PUNCH. A HOLE WILL BE PUNCHED IN COLUMN I CORRESPONDING TO THE POCKET INTO WHICH THE CARD IS TO BE SORTED.

IF SENSE SWITCH C IS "ON", CARDS FROM THE READ FEED WILL SORT IN POCKET I, AND THE CARDS FROM THE PUNCH FEED WILL SORT IN POCKET 4. SENSE SWITCH D "ON" WILL CAUSE THEM TO MERGE IN THE 8/2 POCKET.

BRANCH LAST CARD (SENSE SW A) - BLOCK 9999

TURN SENSE SWITCH A, I/O CHECK, STOP "ON". RUN THE DECK IN; IT WILL BRANCH ON LAST CARD 4000 TIMES AND COME TO A PROGRAM STOP WITH I STAR AT 600. TURN SENSE SWITCH A "OFF" AND PRESS THE START KEY. THE PROGRAM WILL TEST BRANCH ON LAST CARD 4000 TIMES BUT WILL NOT BRANCH BECAUSE SWITCH A IS OFF. WHEN THE PROGRAM IS FINISHED, IT COMES TO A PROGRAM STOP WITH I STAR AT 700 IF TEST WORKS CORRECTLY (645 IF SWITCH A IS STILL ON OR SHORTED).

COLUMN BINARY TESTS (BLOCKS 3000-3040), ADVANCED PROGRAMMING TESTS (BLOCKS 3100-3130), MULTIPLY-DIVIDE-BRANCH DIVIDE OVERFLOW TESTS (BLOCKS 3200-3220), AND HIGH-LOW-EQUAL COMPARE TESTS (BLOCKS 3300-3320). (PRINT OUT ON EQUAL ONLY).

WITH SENSE SWITCH C AND E ON, THESE TESTS MAY BE RUN INDIVIDUALLY OR CHAINED USING STEPS 5 THROUGH 8 FOR THE STANDARD FEATURES TESTS. READ COLUMN BINARY (BLOCK 3030) SHOULD BE RUN LAST SINCE THIS TEST USES AS DETAIL CARDS THE 60 CARDS PUNCHED BY THE PUNCH COLUMN BINARY TEST (BLOCK 3020).

BOX 3 CONTAINS ALL OF THE TAPE TESTS. THEY MAY BE RUN INDIVIDUALLY OR CHAINED USING STEPS 5 THROUGH 8 FOR THE STANDARD FEATURES TESTS. IT IS SUGGESTED THAT SENSE SWITCH E BE LEFT OFF SO THAT TAPE ERRORS DO NOT STOP THE I40I. ADDITIONAL STEPS MUST BE TAKEN AS FOLLOWS:

1. ALL TAPE TESTS USE DRIVE 4 IN BLOCKS 5000 THROUGH 5080 WHICH ARE CHAINED. TAPE TO TAPE TEST (BLOCK 5020) USES DRIVES 4 AND 5.

2. IRG MEASUREMENT TEST (BLOCK 5500) REQUIRES DIFFERENT SENSE SWITCH SETTINGS THAN THE OTHER TESTS. THEREFORE, IT HAS A STOP CODE AT THE BEGINNING OF THE TEST (I STAR AT 400) TO ALLOW THE OPERATOR TO:

   A. SET SENSE SWITCH C ON IF 729 MODEL IV
      OFF IF 729 MODEL II

   B. SET SENSE SWITCH B ON TO WRITE VARIABLE LENGTH RECORDS
      OFF TO WRITE FIXED LENGTH RECORDS

   C. SET SENSE SWITCH G ON IF INDEXING FEATURE IN THIS SYSTEM.

   D. SET DRIVE 4 TO HIGH DENSITY.

   E. TO OBTAIN PRINTOUT RESULTS, MANUALLY ENTER "I" IN I252.

3. COMPRESSED TAPE READ AND EXPAND (5330B)

   USE DRIVE 4. RUN THIS BLOCK ONLY IF YOUR I40I HAS THE EXPAND COMPRESS TAPE FEATURE.

ROUTINES FOR WRITING, READING, AND COPYING TESTS ON TAPE

(TESTS ARE CHAINED. PUT DETAIL CARDS BEHIND THE TEST. SENSE SWITCH A "ON".)

DATE	EC NO	DATE	EC NO	DATE	EC NO
2-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	110301E				
11-20-61	113401				

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WRITE TEST TAPE ROUTINE (BLOCK 5300)

THIS ROUTINE IS USED WITH AT LEAST A 2K STORAGE TO TRANSFER THE TEST PROGRAMS FROM CARDS TO TAPE (DRIVE 6). THE FOLLOWING PROGRAMS CANNOT BE WRITTEN ON TAPE:
BLOCKS 0001, 0002, DETAIL CARDS FOR 1040 AND 5000, 1050 THROUGH 1080, 3500, 9000 AND 9999. NORMALLY, BLOCKS 5000, 5010, AND 5020 SHOULD BE RUN ONLY FROM CARDS.

PLACE THE WRITE, READ, AND COPY ROUTINES (BLOCKS 5300, 5310 AND 5320) IN THE FILE FEED IN FRONT OF ALL PROGRAMS TO BE WRITTEN ON TAPE. SET SENSE SWITCH A "ON". PRESS THE 1402 LOAD KEY TO CAUSE ALL OF THE TESTS TO BE WRITTEN ON TAPE DRIVE 6. BLOCK 5300 STAYS IN 1401 STORAGE AND DOES NOT GO ON TAPE.

READ TEST TAPE ROUTINE (BLOCK 5310) (FIRST RECORD ON TAPE)

THIS ROUTINE IS THE FIRST RECORD WRITTEN ON TAPE BY THE WRITE TEST TAPE ROUTINE. IT PROVIDES A PROGRAM TO RUN TESTS FROM TAPE AND IS SETUP AS FOLLOWS:

1. LOAD THE MASTER TAPE REEL ON DRIVE 1.

2. PRESS THE TAPE LOAD KEY. A PROGRAM STOP WILL OCCUR WITH THE I STAR AT 1366 TO PERMIT THE OPERATOR TO SET UP THE MACHINE:

   A. ENTER A "I" IN 1252 IF TITLE AND HEADINGS PRINTOUT IS DESIRED.

   B. SET SENSE SWITCHES AS DESIRED.

   C. MANUALLY ENTER SELECTION CODES FOR OPTIONAL FEATURES TESTS. FOR EXAMPLE, ENTER A "I" IN 1257 TO RUN ADVANCED PROGRAMMING TESTS. REFER TO PAGES 12 AND 13 OF INTRODUCTION TO TEST DESCRIPTIONS (BLOCK 0000B) FOR LISTING OF SELECTION CODES.

3. PRESS THE START KEY.

4. TESTS WILL RUN REPEATEDLY UNTIL STOPPED BY THE OPERATOR.

COPY TEST TAPE ROUTINE (BLOCK 5320) (SECOND RECORD ON TAPE)

THIS ROUTINE IS USED TO REPRODUCE THE MASTER TAPE REEL. IT MAY BE RUN FROM CARDS OR FROM THE MASTER TAPE REEL. IF RUN FROM TAPE:

1. PRESS THE TAPE LOAD KEY.

2. A PROGRAM STOP WILL OCCUR WITH THE I STAR AT 1366.

3. MANUALLY ENTER A "I" IN 1254.

4. PRESS START KEY TO CAUSE THE COPY TEST TAPE ROUTINE TO READ FROM DRIVE 1 AND WRITE ON DRIVE 2.

IF SENSE SWITCH D IS "ON", DRIVE 1 WILL BE WRITTEN REPEATEDLY ON DRIVE 2 UNTIL END OF REEL OCCURS ON DRIVE 2 OR SENSE SWITCH D IS TURNED "OFF". WHEN WRITING IS COMPLETED A TAPE MARK WILL BE WRITTEN ON DRIVE 2 AND THE PROGRAM ENDS AT THE STOP CODE IN LOCATION 240.

ON TAPE, THE PROGRAM TEST DECKS FOLLOW IN THE SAME ORDER AS THE CARD TEST THAT FOLLOWED BLOCKS 5300, 5310, AND 5320.

DATE	EC NO	DATE	EC NO	DATE	EC NO
12-13-60	109998				
2-6-61	110738				
3-27-61	110306				
8-28-61	110301E				
1-25-6	113401				