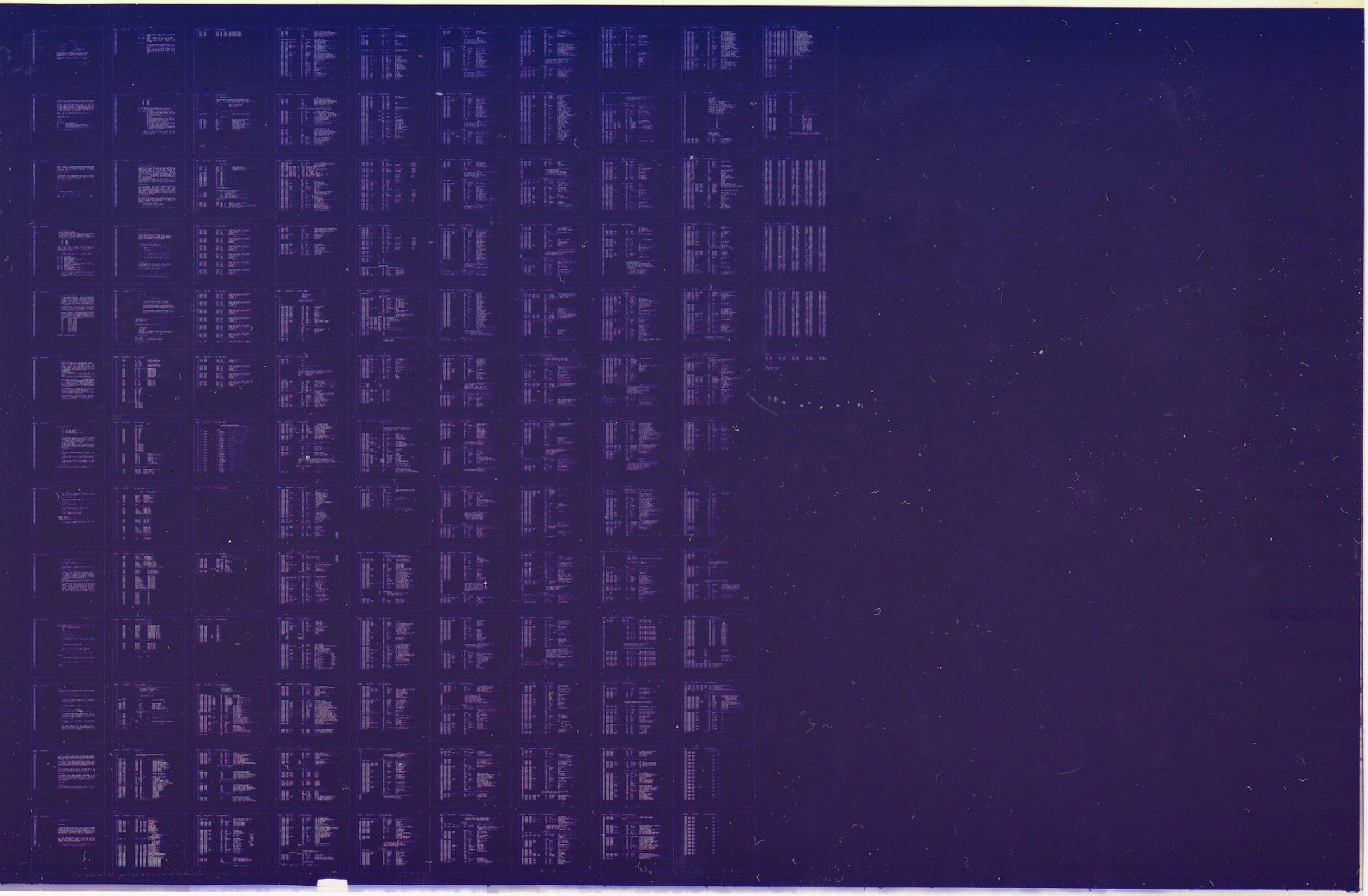
DZ11

DZ11 ASYCH MUX TST
CZDZAI0

AH-8783I-MC
1 OF 1 OCT 1985
 MADE IN USA



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5607                                    .REM ⌘
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5615                                                    IDENTIFICATION
5616                                                    - ---------- -
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5618
5619                                        PRODUCT CODE:           AC-8781I-MC
5620
5621                                        PRODUCT NAME:           CZDZAIO DZ11 LN ASYNC MUX TSTS
5622
5623                                        PRODUCT DATE:           JUNE 1985
5624
5625                                        MAINTAINER:             NAC SOFTWARE ENGINEERING
5626
5627                                        AUTHOR:                 DAVE HOFFMAN
5628
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5644
5645                                    1.      ABSTRACT
5646
5647                                            THE  FUNCTION OF THE DZ11 DIAGNOSTICS IS TO VERIFY THE  OPTION  OPERATES
5648                                            ACCORDING  TO SPECIFICATIONS.  THE DIAGNOSTICS ALSO VERIFY THAT THE DZ11
5649                                            OPERATES IN ITS ENVIRONMENT SUCH AS THE SYSTEM IN WHICH IT IS INSTALLED.
5650
5651                                            PARAMETERS MAY BE SUPPLIED TO THE PROGRAM BY  EITHER  'AUTO  SIZING'  OR
5652                                            INPUT FROM THE USER ON THE CONSOLE BY HAVING SW00=1 AT START TIME.  AUTO
5653                                            SIZING WILL BE DONE ONLY THE FIRST  TIME  THE  PROGRAM  IS  STARTED  AND
5654                                            SW07=0  AND  SW00=0  AND SW03=0.  THE AUTOSIZER IS DESIGNED  TO   DETECT
5655                                            DZ11 DEVICE ADDRESSES AND VECTORS AND TO DETERMINE WHETHER THE DZ11 THAT
5656                                            IS DETECTED IS AN EIA OR 20MA BOARD.  ALL REMAINING  PARAMETERS  DEFAULT
5657                                            TO CERTAIN VALUES (SEE SEC.8.5).  CONSOLE INPUT MAY BE CONTROLLED AT ANY
5658                                            START TIME THROUGH THE USE OF SW00, SW03, SW04, AND SW06 (SEE SEC. 4.1.1
5659                                            FOR A DETAILED DESCRIPTION OF THESE SWITCHES).
5660
5661                                            CURRENTLY THERE IS ONE STANDALONE DIAGNOSTIC (CZDZA), ONE SYSTEM
5662                                            FOR DEC X/11 (DZAA), AND AN ONLINE OVERLAY FOR DZITA (ITEP)   DZDZB.
5663                                            (ITEP)   DZDZ8.
5664
5665                                            CZDZA WILL TEST ALL PARTS OF THE DZ11 SUCH AS CABLES, DIST PNL.,
5666                                            INTERFACE MODULE ITSELF.
5667
5668                                    2.      REQUIREMENTS
5669
5670                                    2.1     EQUIPMENT
5671
5672                                            ANY PDP11 FAMILY CPU (WITH MINIMUM 8K MEMORY)
5673                                            ASR 33 (OR EQUILIVALENT FOR CONSOLE)
5674                                            DZ11            INTERFACE MODULE (M7819(EIA), M7814(20MA))
5675                                            H3271           STAGGERED TURNAROUND CONNECTOR FOR EIA MODULE.
5676                                            H3190           STAGGERED TURNAROUND CONNECTOR FOR 20MA MODULE.
5677                                            H325            CABLE TURNAROUND AND DIST PNL TESTING FOR EIA MODULE.
5678                                            H315            THIS MAY BE SUBSITUTED FOR H325.
5679
5680                                            NOTE:   A STAGGERED TURNAROUND CONNECTOR IS NEEDED IN ORDER TO TEST  THE
5681                                                    PARITY AND BREAK LOGIC.
5682
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5684
5685                                    2.2     STORAGE
5686
5687                                            PROGRAM WILL USE ALL 8  OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP  LOADER
5688                                            RESIDE.   LOCATION 1500  THRU 2000 ARE ESPECIALLY TO BE NOTED AND TO BE
5689                                            UNTOUCHED BY OPERATOR AFTER PARAMETERS  HAVE  BEEN  INPUT  FROM  CONSOLE
5690                                            (SW00=1);   OR  AFTER  THE 'AUTO SIZING' HAS BEEN DONE.  THESE LOCATIONS
5691                                            MAY BE CHANGED IF THE  USER  UNDERSTANDS  THEIR  MEANING  AND  DIFFERENT
5692                                            PARAMETERS ARE REQUIRED.
5693
5694                                    3.      LOADING PROCEEDURE
5695
5696                                    3.1     METHOD
5697
5698                                            ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED  USING  THE  ABSOLUTE
5699                                            LOADER.  NOTE:  IF   THE  DIAGNOSTICS  ARE  ON  A  MEDIA  SUCH  AS  DISK
5700                                            ,MAGTAPE,DECTAPE, OR CASSETTE;   FOLLOW  INSTRUCTIONS  FOR  THE  MONITOR
5701                                            WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.
5702
5703                                            ABSOLUTE LOADER STARTING ADDRESS #500
5704
5705                                            MEMORY  # SIZE
5706
5707                                            4K      17
5708                                            8K      37
5709                                            12K     57
5710                                            16K     77
5711                                            20K     117
5712                                            24K     137
5713                                            28K     157
5714
5715
5716                                    3.1.1   PLACE ADDRESS OF ABS LOADER INTO SWITCH REGISTER.
5717                                                    (ALSO PLACE 'HALT' SW UP)
5718
5719                                    3.1.2   DEPRESS 'LOAD ADDRESS' KEY ON CONSOLE AND RELEASE.
5720
5721                                    3.1.3   DEPRESS 'START KEY' ON  CONSOLE  AND  RELEASE  (PROGRAM  SHOULD  NOW  BE
5722                                            LOADING INTO CPU)
5723
5724
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5726
5727                        4.      STARTING PROCEEDURE
5728
5729                                A.  SET SWITCH REGISTER TO 000200
5730                                B.  DEPRESS 'LOAD ADDRESS' KEY AND RELEASE
5731                                C.  SET SWR TO ZERO FOR 'AUTO SIZING'  OR SET SW00=1 FOR  USER PARAMETER
5732                                    INPUT FROM CONSOLE TERMINAL.   ON  FIRST  START IF SW07=1 AND SW00=0
5733                                    THE PROGRAM WILL DEFAULT TO CONSOLE PARAMETER INPUT (SW00=1).
5734                                D.  DEPRESS 'START KEY' AND RELEASE. THE PROGRAM WILL TYPE MAINDEC  NAME
5735                                    AND  PROGRAM  NAME (IF THIS WAS THE FIRST START UP OF THE PROGRAM OR
5736                                    PARAMETERS WERE CHANGED BY SW00=1) AND ALSO THE FOLLOWING:
5737
5738                                        'MAP OF DZ11 STATUS'
5739                                        1500    160100
5740                                        1502    000300
5741                                        1504    000005
5742                                        1506    000377
5743                                        1510    017070
5744                                        1512    000000
5745
5746                                THE ABOVE IS ONLY AN EXAMPLE!  THIS  WOULD  INDICATE  THE  STATUS  TABLE
5747                                STARTING  AT  ADD.   1500  IN  THE  PROGRAM.   THE  STATUS TABLE MUST BE
5748                                VERIFIED BY THE USER IF AUTO SIZING IS DONE.  FOR INFORMATION OF  STATUS
5749                                TABLE SEE SECTION 8.4 FOR HELP.
5750                                THE PROGRAM WILL TYPE "RUNNING" AND PROCEED TO RUN THE DIAGNOSTIC.
5751
5752                        4.1     CONTROL SWITCH SETTINGS
5753
5754                                NOTE:   IF THERE IS NO REAL  SWR  (177570);   SWR  MAY  BE  MODIFIED  AT
5755                                        LOC:176 OR BY HITTING CONTROL "G" <↑G> ON CONSOLE TERMINAL.
5756
5757                                SW 15   SET:  HALT ON ERROR
5758                                SW 14   SET:  LOOP ON CURRENT TEST
5759                                SW 13   SET:  INHIBIT ERROR PRINT OUT
5760                                SW 12   SET:  INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
5761                                SW 11   SET:  INHIBIT ITERATIONS.  (QUICK PASS)
5762                                SW 10   SET:  ESCAPE TO NEXT TEST
5763                                SW 09   SET:  LOOP WITH CURRENT DATA
5764                                SW 08   SET:  CATCH ERROR AND LOOP ON IT
5765                                SW 07   SET:  NO AUTO SIZE.  IF 1ST START OF  PROGRAM AFTER  LOADING THE
5766                                              OPERATOR MUST INPUT ADDRESS AND VECTOR FROM CONSOLE.
5767                                SW 06   SET:  RESELECT DZ11'S DESIRED ACTIVE
5768                                SW 05   SET:  RUN BAUD RATE TEST
5769                                SW 04   SET:  SELECT DELAY PARAMETER (SEE SEC. 4.1.1)
5770                                SW 03   SET:  EXTRA PARAMETER INPUT  (SEE SEC. 4.1.1)
5771                                SW 02   SET:  LOCK ON SELECTED TEST
5772                               **SW 01  SET:  RESTART PROGRAM AT SELECTED TEST
5773                                *SW 00  SET:  GET USERS PARAMETERS FROM CONSOLE
5774
5775                                 *      FOR  ECHO OR  CABLE TESTS   (PROGRAM STARTED AT LOC. 210)   THIS
5776                                        SWITCH  SET TO 1 ALLOWS  THE USER TO  TYPE IN THE VECTOR AND THE
5777                                        CSR FOR THE DZ11 UNDER TEST.
5778                                 **     FOR ECHO OR CABLE TEST THIS SWITCH SET TO 1 ALLOWS THE SELECTION
5779                                        OF EITHER THE ECHO OR CABLE TEST, BAUD RATE, AND THE LINE NUMBER
5780                                        UNDER TEST.
```

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5782
5783                                4.1.1   SWITCH REGISTER CONTROL OF PARAMETER INPUT FROM CONSOLE
5784
5785                                        SW 00   GET USERS PARAMETERS FROM CONSOLE.  SETTING THIS SWITCH AT START
5786                                                UP  TIME  ALLOWS  THE USER TO INPUT AT THE CONSOLE TERMINAL  THE
5787                                                FOLLOWING PARAMETERS:  BASE DEVICE ADDRESS, BASE VECTOR ADDRESS,
5788                                                BUS REQUEST LEVEL, DECLARE EIA OR 20MA MODULE, MODE OF OPERATION
5789                                                (EXTERNAL,INTERNAL, OR STAGGERED), AND THE NUMBER OF DZ11'S THAT
5790                                                ARE RUNNING.   USING  THIS  SWITCH  ALONE DEFAULTS THE FOLLOWING
5791                                                PARAMETERS:  ALL 8 LINES ARE SET TO BE TESTED ON EACH DZ11,  THE
5792                                                DEFAULT BAUD RATE IS SET AT 9600 BAUD, AND THE CHARACTER LENGTH
5793                                                FOR  THE MAJORITY  OF TESTING IS SET AT EIGHT BITS PER CHARACTER
5794                                                WITH TWO STOP BITS.
5795
5796                                        SW 03   EXTRA PARAMETER INPUT.  SETTING  THIS  SWITCH  AT  START UP TIME
5797                                                PROVIDES  THE  USER WITH THE ABILITY TO SET THE LINES ACTIVE FOR
5798                                                TESTING AND TO SET THE DEFAULT  BAUD RATE USED  FOR THE MAJORITY
5799                                                OF THE DIAGNOSTIC  TESTS.  THE DELAY PARAMETER  IS AUTOMATICALLY
5800                                                ADJUSTED TO THE BAUD RATE GIVEN BY THE USER.
5801
5802                                        SW 04   SELECT DELAY PARAMETER. THE DELAY PARAMETER THIS SWITCH CONTROLS
5803                                                DETERMINES THE LENGTH OF TIME THE PROGRAM STALLS WAITING  FOR  A
5804                                                CHARACTER  TO BE COMPLETELY TRANSMITTED OR RECEIVED.  THIS DELAY
5805                                                COUNT IS AUTOMATICALLY SET TO PROVIDE ENOUGH DELAY TIME  FOR THE
5806                                                DEFAULT BAUD RATE SPECIFIED WHEN RUNNING THE PROGRAM ON AN 11/45
5807                                                WITH  BIPOLAR  MEMORY.  WHEN  RUNNING  THIS  PROGRAM ON A FASTER
5808                                                PROCESSOR THE DELAY  PARAMETER SHOULD BE ADJUSTED PROPORTIONALLY
5809                                                HIGHER THAN THE FOLLOWING DEFAULTED VALUES:
5810                                                2450            ;TIME FOR   50 BAUD
5811                                                1560            ;TIME FOR   75 BAUD
5812                                                1120            ;TIME FOR  110 BAUD
5813                                                0750            ;TIME FOR  134 BAUD
5814                                                0660            ;TIME FOR  150 BAUD
5815                                                0330            ;TIME FOR  300 BAUD
5816                                                0150            ;TIME FOR  600 BAUD
5817                                                0060            ;TIME FOR 1200 BAUD
5818                                                0040            ;TIME FOR 1800 BAUD
5819                                                0030            ;TIME FOR 2000 BAUD
5820                                                0020            ;TIME FOR 2400 BAUD
5821                                                0010            ;TIME FOR 3600 BAUD
5822                                                0001            ;TIME FOR 4800 BAUD
5823                                                0001            ;TIME FOR 7200 BAUD
5824                                                0001            ;TIME FOR 9600 BAUD
5825                                                0001            ;TIME FOR 19.2 KBAUD
5826
5827                                        *** NOTE ***
5828                                        19.2K BAUD IS AN UNSUPPORTED BAUD RATE. IT SHOULD NOT NORMALLY BE USED.
5829                                        9600 BAUD IS THE SPECIFIED MAXIMUM.
5830
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5832
5833                                    4.1.2   SWITCH REGISTER RESTRICTIONS
5834
5835                                            SW 06   RESELECT DZ11'S DESIRED ACTIVE.  PLEASE NOTE THAT A  MESSAGE  IS
5836                                                    TYPED  OUT  FOR  SETTING  THE  SWITCH  REGISTER  EQUAL TO DZ11'S
5837                                                    ACTIVE.   THIS  MEANS  IF  THE  SYSTEM  HAS  FOUR  DZ11S;   BITS
5838                                                    00,01,02,03  WILL  BE  SET  IN  LOC  'DZACTV'  FROM  THE  SWITCH
5839                                                    REGISTER.     USING     THIS     SWITCH(SW06)     ALTERS     THAT
5840                                                    LOCATION;THEREFORE  IF FOUR DZ11S ARE IN THE SYSTEM ***DO NOT***
5841                                                    SET SWITCHES GREATER THAN SW 03 IN THE UP POSITION.  THIS  WOULD
5842                                                    BE A FATAL ERROR.  DO NOT SELECT MORE ACTIVE DZ11S THAN HAS BEEN
5843                                                    GIVEN INFORMATION ABOUT IN PARAMETER INPUT (SW00=1)
5844                                    METHOD: A:      LOAD ADDRESS 200
5845                                            B:      START WITH SW 06=1
5846                                            C:      PROGRAM WILL TYPE MESSAGE
5847                                            D:      SET THE BINARY NUMBER OF  DZ11S  DESIRED  ACTIVE  EXAMPLE:   1=1
5848                                                    DZ11;   3=2  DZ11;   7=3 DZ11;  17=4 DZ11 37=5 DZ11 ETC/AA PRESS
5849                                                    CONTINUE.
5850                                            E:      NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05)
5851                                            F:      SET WITH ANY OTHER SWITCH SETTINGS DESIRED.  PRESS CONTINUE.
5852
5853
5854                                            SW 01   RESTART PROGRAM AT SELECTED TEST        IT IS STRONGLY SUGGESTED
5855                                                    THAT  AT LEAST ONE PASS HAS  BEEN MADE BEFORE TRYING TO SELECT A
5856                                                    TEST THAT IS NOT IN THE ORDER OF SEQUENCE THE  REASON  BEING  IS
5857                                                    THAT  THE  PROGRAM  HAS  TO  CLEAR  AREAS AND SET UP PARAMETERS.
5858                                                    NOTE:  IF RUNNING MULTIPLE DZ11'S;  THE DZ11 YOU  DESIRE  TO  BE
5859                                                    UNDER TEST MUST BE SELECTED BY THE USE OF SW06 BEFORE LOCKING ON
5860                                                    THE TEST.  IN OTHER WORDS;  EACH TIME THE  PROGRAM  IS  STARTED;
5861                                                    THE  FIRST DZ11 WILL BE SELECTED TO BE UNDER TEST UNLESS SW06 IS
5862                                                    USED TO SELECT ONLY ONE.
5863
5864                                            SW 09   LOOP ON CURRENT DATA:   THIS  SWITCH  WILL  ONLY  WORK  IF  CALL
5865                                                    'SCOP1'  IS IN THAT TEST.  THE REASON BEING THAT MOST TESTS DEAL
5866                                                    WITH BLOCKS OF DIFFERENT DATA TO BE SENT OR RECEIVED ALL AT ONCE
5867                                                    THUS IN BLOCK DATA, ONE PATTERN CAN'T BE SINGLED OUT.
5868                                                    THIS SWITCH IS DESIGNED TO PROVIDE AN AID FOR A TRAINED TROUBLE-
5869                                                    SHOOTER TO SAMPLE VARIOUS SIGNALS ON THE MODULE AND IS NOT MEANT
5870                                                    TO BE USED AS A GENERAL USER CONTROL SWITCH.
5871
5872                                            SW 04   SELECT DELAY PARAMETER: THIS SWITCH SHOULD BE USED  WITH  CARE
5873                                                    AS TOO SHORT A DELAY WILL CAUSE VALID TESTS TO FAIL ON CERTAIN
5874                                                    PROCESSORS.  IT IS  RECOMMENDED THAT THIS SWITCH  ONLY BE USED
5875                                                    IN CONJUNCTION WITH SCOPE LOOPS, E.G, SW 14,9,4,1 SET; SW 9,4,
5876                                                    2,1 SET.  THE SHORTEST PARAMETER IS 1; THE LONGEST ACCEPTED IS
5877                                                    177776. (SEE SEC. 4.1.1)
```

4.1.3 SWITCH REGISTER PRIORITIES

ERROR SWITCHES

1. SW 12 DELETE PRINT OUT/BELL ON ERROR.
2. SW 13 DELETE ERROR PRINTOUT.
3. SW 15 HALT ON THE ERROR.
4. SW 08 GOTO BEGINNING OF THE TEST(ON ERROR).
5. SW 10 GOTO NEXT TEST(ON ERROR).

SCOPE SWITCHES

1. SW 09 (IF ENABLED BY 'SCOP1'). IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. ON AN ERROR REPORT (EX. *TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS *USUALLY* THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0) IF THE PROGRAM USER IS TECHNICALLY TRAINED TO ELECTRONICALLY ISOLATE SIGNAL PROBLEMS ON THE DZ11 MODULE.
   IF SW09 IS NOT ENABELED; AND THERE IS A *HARD* ERROR (CONSTANT); SW08 IS BEST.
2. FOR INTERMITTENT ERRORS EITHER START THE PROGRAM WITH SW01 AND SW02 SET WHICH WILL ALLOW THE USER TO LOCK ON A SELECTED TEST, OR ELSE SET SW14 AS AN ERROR IS BEING TYPED OUT ON THE TERMINAL. SW14 WILL CONTINUE TO LOOP ON THAT TEST REGARDLESS OF WHETHER AN ERROR OCCURS.
3. SW 14 LOOP ON CURRENT TEST.

4.2 STARTING ADDRESS

SA 200 - ADDRESS 200 IS FOR NORMAL EXECUTION OF THE DIAGNOSTIC. THIS WILL DO THE MAJOR TESTING NECESSARY FOR VERIFICATION OF HARDWARE.

SA 210 - CABLE/ECHO - TERMINAL TESTS. STARTING AT ADDRESS 210 WILL GIVE THE USER THE OPTION TO VERIFY THE EIA CABLES AT THE DIST PNL OR VERIFY A TRUE LINK TO ANY DEC SUPPORTED TERMINAL SUPPORTED BY THE DZ11.

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY. AFTER *ALL* AVAILABLE DZ11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION FOUR WILL BE PRINTED AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC.

```
5929
5930                                    5.1     NORMAL START OF DIAGNOSTIC
5931
5932                                            ON THE FIRST START OF THE DIAGNOSTIC AT ADDRESS 200;  IF AUTO
5933                                            SIZING IS NOT USED OR WHENEVER SW00=1:  THE FOLLOWING QUESTIONS
5934                                            ARE ASKED AND MUST BE ANSWERED.
5935
5936                                    "1ST CSR ADDRESS (160000:163700):  "
5937
5938                                            YOU MUST TYPE IN THE FIRST DZ11 CSR IN THE SYSTEM YOU WISH
5939                                            TESTING TO BEGIN AT.  RANGE:  160000:163700
5940
5941                                    "1ST VECTOR ADDRESS (300:770):  "
5942
5943                                            YOU MUST TYPE IN THE VECTOR OF THE FIRST DZ11 IN THE SYSTEM
5944                                            UNDER TEST.  RANGE 300:770
5945
5946                                    "BR LEVEL (4:6):  "
5947
5948                                            TYPE IN THE PRIORITY LEVEL OF THE DZ11 THAT THE ABOVE
5949                                            INFORMATION HAS BEEN GIVEN ABOUT.  RANGE 4 OR 5 OR 6.
5950
5951                                    "TYPE "A" FOR EIA MODULE OR "B" FOR 20MA (A:B):  "
5952
5953                                            TYPE "A" IF RUNNING A DZ11-A,B,E (EIA).
5954                                            TYPE "B" IF RUNNING A DZ11-C,D,F (20MA).
5955                                            TYPING A <CR> DEFAULTS TO EIA MODULES.
5956
5957                                    "MAINTENANCE MODE
5958                                     [EXTERNAL  <H325>-EIA ONLY     (E)]
5959                                     [INTERNAL  <DZCSR03=1>         (I)]
5960                                     [STAGGERED <H3271>-EIA ONLY    (S)]
5961                                     [STAGGERED <H3190>-20MA ONLY   (S)]  :
5962
5963                                            TYPE "E" OR "I" OR "S" DEPENDING ON WHICH MODE YOU WISH TO RUN
5964                                            IN.    IF RUNNING "EXTERNAL";  ALL SELECTED LINES MUST BE
5965                                            TERMINATED BY AN H325 TEST CONNECTOR.
5966
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                        "# OF DZ11'S <IN OCTAL> (1:20):  "

                                TYPE TOTAL NUMBER OF DZ11'S TO BE TESTED IN THE  SYSTEM.   RANGE
                                IS 1 THRU 20 IN OCTAL.

                            ********* IF SW03=1 THEN *********
                                IF SW03=1 THE FOLLOWING WILL BE PRINTED.

                        "LINES ACTIVE BY BIT <IN OCTAL> (001:377):"

                                EACH BIT REPRESENTS A LINE AND ANY COMBINATION OF LINES  MAY  BE
                                SELECTED  (HOWEVER  IN STAGGERED MODE TWO ADJACENT LINES MUST BE
                                SELECTED (0-1, 2-3, 4-5, 6-7))..

                        "DEFAULT BAUD RATE <IN OCTAL> (00:16):  "

                                THIS GIVES THE USER A CHANCE TO CHANGE  THE  DEFAULT  BAUD  RATE
                                USED IN APP. 90 PERCENT OF THE TEST. BAUD RATE CHOICES ARE:
                                "00"(  50 BAUD),"01"(  75 BAUD),"02"( 110 BAUD),"03"( 134 BAUD),
                                "04"( 150 BAUD),"05"( 300 BAUD),"06"( 600 BAUD),"07"(1200 BAUD),
                                "10"(1800 BAUD),"11"(2000 BAUD),"12"(2400 BAUD),"13"(3600 BAUD),
                                "14"(4800 BAUD),"15"(7200 BAUD),"16"(9600 BAUD),"17"(19.2 KBAUD)
                                LOW DEFAULT BAUD RATES ARE NOT SUGGESTED SINCE THEY LENGTHEN THE
                                TIME TO COMPLETE A PROGRAM PASS DRAMATICALLY.
                                *** NOTE ***
                                SPEED SELECT CODE 17 CAN BE USED TO SELECT 19.2K BAUD, BUT THIS
                                SPEED IS NOT SPECIFIED BY DEC, AND SHOULD NOT NORMALLY BE USED.
                            ************************************

                                IT IS IMPORTANT TO NOTE THAT ALL DZ11'S IN THE  SYSTEM  MUST  BE
                                CONTIGIOUS  FOR  BOTH  ADDRESS  AND VECTORS.  ALSO ALL THE EXTRA
                                PARAMETERS OTHER THAN CSR AND VECTORS ARE GIVEN TO THE  EXISTING
                                DZ11'S IN THE SYSTEM.  IF NOT ALL DZ11'S ARE SAME PRIORITY OR IF
                                THE MODE OF OPERATION IS DIFFERENT FOR EACH DZ11;  THIS MUST  BE
                                "PATCHED"  INTO THE CORRECT STATUS MAP ENTRY WHICH IS PRINTED AT
                                START TIME.  AN ALTERNATIVE IS TO  PUT  SW00=1  AT  START  TIME;
                                ANSWER  QUESTIONS ABOUT DZ11 UNDER TEST AND INDICATE ONLY 1 DZ11
                                IN THE SYSTEM.  IF THE STATUS MAP IS TO BE "PATCHED" IT MUST  BE
                                DONE AFTER THE QUESTIONS ARE ANSWERED OR AFTER THE AUTO SIZE.
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```
6009
6010                                5.2     HOW TO RUN THE "CABLE/ECHO" TESTS.
6011
6012                                        NORMAL STARTING FOR THE FIRST TIME WOULD BE:  LOAD ADDRESS  210;   START
6013                                        WITH THE SWR EQUAL TO 003.
6014                                        NOTE:   SW00=1  ASKS FOR "VECTOR" AND "CSR"
6015                                                SW01=1  ASKS FOR "WHICH TEST ECHO OR CABLE", "BAUD RATE", "LINE"
6016                                                UNDER TEST.  PROGRAM WILL PRINT OUT:
6017
6018                                        "VECT\ - ADDRESS-"
6019
6020                                                YOU TYPE VECTOR WITH A <CR>.
6021
6022                                        "CONTROL REGISTER ADDRESS-"
6023
6024                                                YOU TYPE IN DZCSR UNDER TEST.
6025
6026                                        "WHICH TEST ?  ECHO OR CABLE (E OR C)"
6027
6028                                                LETS DO THE CABLE TEST FIRST.  **THIS TEST IS ONLY TO BE DONE ON
6029                                                THE  EIA  VERSION  OF  THE DZ11 NOT THE 20MA VERSION".  TYPE "C"
6030                                                <CR>
6031
6032                                        "BAUD RATE- "
6033
6034                                                TYPE EITHER 50, 110, 135, 150, 300, 600, 1200 1800, 2000,  2400,
6035                                                3600, 4800, 7200, 9600 FOLLOWED BY <CR>
6036
6037                                        "LINE:  "
6038
6039                                                YOU TYPE THE LINE WHICH HAS  THE  H325  TEST  CONNECTOR.   (TYPE
6040                                                EITHER 0, 1, 2, 3, 4, 5, 6, 7) PROGRAM WILL THEN PRINT:
6041
6042                                        "CABLE TEST"
6043
6044                                                AND IF EVERYTHING IS WORKING;  THE FOLLOWING WILL BE PRINTED:
6045
6046                                        "PASS DONE."
6047                                        "PASS DONE."
6048                                          ETC.
6049                                                TO CHANGE LINES;  HIT ANY PRINTING KEY ON YOUR CONSOLE  TERMINAL
6050                                                WHILE THE PROGRAM IS RUNNING AND THE FOLLOWING WILL BE PRINTED:
6051
6052                                        "LINE:  "
6053
6054                                                NOW CHANGE THE H325 TEST CONNECTOR TO ANOTHER LINE AND TYPE  THE
6055                                                NEW LINE.  PROGRAM WILL THEN PRINT:
6056
6057                                        "CABLE TEST"
6058                                        "PASS DONE."
6059                                        "PASS DONE."
6060                                                CONTINUE THIS OPERATION UNTIL ALL LINES ARE TESTED.
```

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6062
6063                                5.3     ECHO TEST
6064
6065                                        IF PROGRAM HAS ALREADY BEEN STARTED AT 210 AND THE  VECTOR  AND  ADDRESS
6066                                        HAVE  BEEN  TYPED IN;  JUST LOAD ADDRESS 210 AND START WITH SWR EQUAL TO
6067                                        002.  PROGRAM WILL PRINT:
6068
6069                                        "WHICH TEST ?  ECHO OR CABLE (E OR C)"
6070
6071                                                NOW TYPE AN "E" TO DO THE ECHO TEST.  PROGRAM WILL PRINT:
6072
6073                                        "BAUD RATE-"
6074
6075                                                TYPE BAUD RATE AT WHICH THE TERMINAL IS SET THAT IS CONNECTED TO
6076                                                THE DZ11 DIST PNL.  BAUD RATE CHOICES ARE: 50, 75, 110, 135, 150
6077                                                300, 600 , 1200,  1800,  2000, 2400, 3600, 4800, 7200, 9600. THE
6078                                                PROGRAM WILL THEN PRINT:
6079
6080                                       LINE:  '
6081
6082                                                TYPE THE LINE THE TERMINAL IS CONNECTED TO AT THE DIST PNL  THEN
6083                                                THE PROGRAM WILL PRINT:
6084
6085                                        "TERMINAL ECHO TEST"
6086
6087                                                *** AT THIS POINT THE MESSAGE:
6088
6089                                        "THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789"
6090
6091                                                SHOULD BE PRINTED ON THE TERMINAL CONNECTED  TO  THE  DZ11.   IF
6092                                                THIS  MESSAGE IS DESIRED TO BE CONTINIOUSLY OUTPUT;  SET THE SWR
6093                                                TO 377 (SWR=377) WHILE IT IS BEING OUTPUT  OR  WHEN THE LINE NO.
6094                                                IS REQUESTED ABOVE. WHEN THIS MESSAGE IS DONE AND THE SWR IS NOT
6095                                                EQUAL TO 377;  THE CONSOLE WILL PRINT:
6096
6097                                       "TYPE A CHAR.  ON DZ11 TERMINAL"
6098
6099                                                ANY PRINTABLE CHAR HIT ON DZ11 TERMINAL SHOULD BE ECHOED BACK ON
6100                                                THE  TERMINAL.   **IF  YOU HIT CNTRL C <↑C> ON THE DZ11 TERMINAL
6101                                                THE PROGRAM WILL PRINT:
6102
6103                                       "PASS DONE."
6104
6105                                                ON THE CONSOLE TERMINAL  AND  THE  "QUICK  BROWN  FOX"  WILL  BE
6106                                                PRINTED  ON  DZ11  TERMINAL  AGAIN  AND  THE  ECHO  TEST WILL BE
6107                                                RUNNING.  TO CHANGE LINES:  TYPE ANY PRINTABLE CHARACTER  ON THE
6108                                                CONSOLE TERMINAL (NOT THE DZ11 TERMINAL). THE PROGRAM WILL AGAIN
6109                                                TYPE "LINE:  " AND WAIT FOR A RESPONSE.
6110
```

```
6112
6113                    5.4     PROGRAM AND/OR OPERATOR ACTION
6114
6115                            THE  VARIETY  OF  PROGRAM  CONTROL SWITCHES PROVIDED IN THIS  DIAGNOSTIC
6116                    PACKAGE  IS DESIGNED TO  PROVIDE THE USER  WITH A WIDE RANGE OF TROUBLE-
6117                    SHOOTING TECHNIQUES.  BEFORE THE USER ATTEMPTS TO RUN THIS DIAGNOSTIC HE
6118                    SHOULD BECOME  FAMILIAR WITH THE USE OF THESE CONTROL SWITCHES AND THEIR
6119                    RESTRICTIONS.  (SEE SEC. 4.1, 4.1.1, 4.1.2, 4.1.3)
6120
6121                            WHEN THE PROGRAM DETECTS AN ERROR THE TEST NUMBER AND PC WILL BE   TYPED
6122                    OUT AND POSSIBLY  AN ERROR MESSAGE  (DEPENDING ON THE PARTICULAR ERROR).
6123                    IF IT IS NECESSARY TO KNOW MORE INFORMATION  CONCERNING THE ERROR REPORT
6124                    THEN LOOK IN THE  PROGRAM LISTING FOR THAT TEST NUMBER AND THEN NOTE THE
6125                    PC OF THE  ERROR  REPORT.  THE  REASON FOR THE  ERROR REPORT WILL BECOME
6126                    CLEARER WHEN READING THE COMMENTS IN THE PROGRAM LISTING.
6127
6128                    6.      ERRORS
6129
6130                            AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC  TYPED
6131                    OUT  AT  THE  TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0).  IN MOST
6132                    CASES ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE THE  ERROR  MESSAGE
6133                    WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.
6134
6135                    6.2     ERROR RECOVERY
6136
6137                            IF FOR SOME REASON THE DZ11 SHOULD 'HANG THE BUS' (GAIN CONTROL  OF  BUS
6138                    SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP
6139                    IS NECESSARY FOR OPERATOR TO REGAIN CONTROL  OF  CPU.   IF  THIS  SHOULD
6140                    HAPPEN;  LOOK  IN  LOCATION '$TSTNM'  (BYTE 1122) FOR THE NUMBER OF THE
6141                    TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC  ERROR.   IN  THIS
6142                    WAY  THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DZ11 WAS DOING AT THE
6143                    TIME OF THE ERROR.
6144
6145                    7.      RESTRICTIONS
6146
6147                    7.1     STARTING RESTRICTIONS
6148
6149                            SEE SECTION 4.1.2
6150                    STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW PROGRAM  WAS  STARTED.
6151                    ALSO  IT  IS  IMPORTANT  TO  USE THIS LISTING ALONG WITH THE INFORMATION
6152                    PRINTED ON THE TTY TO COMPLETLY ISOLATE PROBLEMS.
6153
```

```
6155
6156                                7.2     OPERATING RESTRICTIONS
6157
6158                                        PARAMETER MUST BE INPUT FROM USER OR APT IF "AUTO SIZING" IS NOT USED.
6159
6160
6161                                8.      MISCELLANEOUS
6162
6163                                8.1     EXECUTION TIME
6164
6165                                        ALL DZ11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS'  MESSAGE  (PROVIDING
6166                                        NO  ERRORS  AND  SW12=0)  WITHIN 2 MIN. THIS IS ASSUMING SW11=1 (INHIBIT
6167                                        ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION.   THE  ACTUAL
6168                                        EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION.  AN 11/40
6169                                        WITH  CORE MEMORY WILL TAKE AROUND 100 SECONDS TO EXECUTE A PASS WITH NO
6170                                        ITERATIONS AND ABOUT  400 SECONDS TO EXECUTE A FULLY ITERATED PASS.  ANY
6171                                        OTHER   PDP11 CPU  TYPE WILL EXECUTE A PASS IN  TIME PROPORTIONAL TO THE
6172                                        EXECUTION SPEED OF THE CPU 'S MEMORY IN RELATION TO THAT OF AN 11/40.
6173
6174                                8.2     PASS COMPLETE
6175
6176                                        NOTE:  *EVERY* TIME THE PROGRAM IS STARTED;  THE TESTS WILL  RUN  AS  IF
6177                                        SW11  (DELETE  ITERATIONS)  WAS  UP  (=1).  THIS IS TO 'VERIFY NO *HARD*
6178                                        ERRORS' AS SOON AS  POSSIBLE.   THEREFORE  THE  FIRST  PASS  -EACH  TIME
6179                                        PROGRAM  IS  STARTED-  WILL BE A 'QUICK PASS' UNTIL ALL DZ11'S IN SYSTEM
6180                                        ARE TESTED.  WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE  FOLLOWING  IS
6181                                        AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.
6182
6183                                        END PASS CZDZA-I  CSR: 160010  VEC: 300  PASSES: 000001  ERRORS:
6184
6185                                        NOTE:   THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE  VALUES  FOR
6186                                                THE DEVICE.  THEY ARE ONLY FOR THIS EXAMPLE.
```

```
6188
6189                                8.4     KEY LOCATIONS
6190
6191                                        $LPADR (1126)   CONTAINS THE ADDRESS  WHERE  PROGRAM  WILL  RETURN  WHEN
6192                                                        ITERATION  COUNT  IS  REACHED  OR  IF  LOOP  ON  TEST  IS
6193                                                        ASSERTED.
6194                                        NEXT   (1360)   CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.
6195                                        $TSTNM (1122)   CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.
6196                                        RUN    (1406)   THE BIT  IN  RUN'  ALWAYS  POINTS  ONE  PAST  THE  DZ11
6197                                                        CURRENTLY     BEING     TESTED.      EXAMPLE:      (RUN)
6198                                                        1304/0000000001000000 MEANS THAT DZ11 NO.05 IS THE  DZ11
6199                                                        NOW RUNNING.
6200                                        STATUS MAP
6201                                        (1500) (2000)
6202                                                        THESE LOCATIONS CONTAIN THE INFORMATION NEEDED  TO  TEST
6203                                                        UP  TO 16 (DECIMAL) DZ11S SEQUENTIALY.  THEY CONTAIN THE
6204                                                        CSR,VECTOR AND STATUS CONCERNING  THE  CONFIGURATION  OF
6205                                                        EACH DZ11.
6206                                        DZACTV (1404)   EACH  BIT  SET  IN  THIS  LOCATION  INDICATES  THAT  THE
6207                                                        ASSOCIATED  DZ11  WILL  BE  TESTED  IN  TURN.   EXAMPLE:
6208                                                        (DZACTV)  1300/0000000000011111  MEANS  THAT  DZ11   NO.
6209                                                        00,01,02,03,04   WILL  BE  TESTED.   EXAMPLE:   (DZACTV)
6210                                                        1300/0000000000010001 MEANS THAT DZ11 NO.  00,04 WILL BE
6211                                                        TESTED.
6212                                        $BASE  (1310)   CONTAINS THE RECEIVER CSR  OF  THE  CURRENT  DZ11  UNDER
6213                                                        TEST.
6214
```

```
6216
6217                                8.4A    MORE ON THAT 'STATUS TABLE' (1500-2000)
6218
6219                                                'MAP OF DZ11 STATUS'
6220                                            1500    160100
6221                                            1502    000300
6222                                            1504    000005
6223                                            1506    000377
6224                                            1510    017070
6225                                            1512    000000
6226
6227
6228                                THE  ABOVE  INFORMATION WILL BE  REPEATED FOR EACH OF UP TO 16 DZ11'S IN
6229                                THE SYSTEM(THESE WILL FOLLOW UNDER THIS TABLE).  EXPLANATION:
6230                                1500    160100  THIS IS THE SYSTEM CONTROL REGISTER FOR THE 1ST DZ11  IN
6231                                                THE SYSTEM.
6232                                1502    000300  THIS IS VECTOR 'A' FOR THE FIRST DZ11 IN THE SYSTEM.
6233                                1504    000005  THIS REPRESENTS THE BUS INTERRUPT PRIORITY LEVEL OF  THE
6234                                                DZ11.   BIT15  OF  THIS LOCATION INDICATES EITHER EIA OR
6235                                                20MA. IF BIT15=0 MODULE  SHOULD  BE AN M7819, IF BIT15=1
6236                                                MODULE SHOULD BE AN  M7814.
6237                                1506    000377  THIS IS THE BINARY REPRESENTATION OF WHAT LINES  ARE  TO
6238                                                BE TESTED.
6239                                1510    017070  THIS IS THE PARAMETER  LOCATION  USED  IN  MOST  OF  THE
6240                                                TESTS.  IT INDICATES PARAMETERS OF:  RX ON, SPEED SELECT
6241                                                16 (9600 BAUD) EIGHT BITS PER CHAR, AND TWO STOP  BITS.
6242                                                THE  USER MAY ALTER THE STOP BITS AND THE SPEED, BUT THE
6243                                                REMAINING PARAMETERS SHOULD BE LEFT ALONE.
6244                                                THIS  LOCATION  IS  USED TO LOAD THE DZ11 LINE PARAMETER
6245                                                REGISTER FOR EACH LINE.   THE MEANING OF THE BITS SET IN
6246                                                THIS LOCATION IS THE SAME AS THE FUNCTION OF THE RELATED
6247                                                BITS IN THE DEVICE LINE PARAMETER REGISTER.
6248                                1512    000000  THIS LOCATION WILL CONTAIN EITHER ALL  ZEROS  INDICATING
6249                                                THAT  INTERNAL LOOP WAS SELECTED AS MODE OF OPERATION OR
6250                                                IT WILL CONTAIN 100000 INDICATING THAT 'STAGGERED  MODE"
6251                                                WAS  SELECTED  OR IT WILL CONTAIN 000200 INDICATING THAT
6252                                                 EXTERNAL" WAS THE MODE SELECTED.
6253
6254                                THE ABOVE IS REPEATED FOR EACH DZ11 IN THE SYSTEM.  THE TABLE IS
6255                                FILLED  BY  AUTO SIZING OR BY THE MANUAL PARAMETER INPUT PROGRAM
6256                                AS  DESCRIBED  PREVIOUSLY.   ALSO  IF  DESIRED  BY  USER;    THE
6257                                LOCATIONS  MAY  BE  ALTERED  BY  HAND  (TOGGLED  IN) TO SUIT THE
6258                                SPECIFIC CONFIGURATION.
6259
```

```
6261
6262                            8.5     *** METHOD OF AUTO SIZING ***
6263
6264                            8.5.1   FINDING THE CONTROL STATUS REGISTER.
6265
6266                                    THE PROGRAM WILL START AT ADDRESS  160000 AND  START  'REFERENCING'  THE
6267                                    ADDRESS  IN  THE  POINTER.  IF A NON-EX MEMORY TRAP OCCURES, THE POINTER
6268                                    (HOLDING 160000) IS UPDATED BY  10  AND  THE  ABOVE  IS  REPEATED  UNTIL
6269                                    ADDRESS 163700 IS REACHED.  IF A 'SLAVE SYNC RESPONSE' WAS ISSUED BY THE
6270                                    DZ11 (OR ANY OTHER DEVICE) (NO  NXM  TRAP),  "MASTER  SCAN  ENABLE"  IS
6271                                    ATTEMPTED TO BE SET AND THE "TCR" BIT FOR LINE 7 IS SET.  "TRDY" IS THEN
6272                                    TESTED TO BE SET AND BOTH "TCR07" AND "MASTER SCAN ENABLE" ARE TESTED TO
6273                                    BE  STILL  SET.  IF ALL OF THIS WORKED;  THEN A "DEVICE CLEAR" IS ISSUED
6274                                    TESTING THAT THE BIT CAN BE READ BACK AND THAT AFTER SOME TIME  IT  SELF
6275                                    CLEARS.   IF  ALL  OF  THE ABOVE WORKED;  THIS DEVICE IS ASSUMED TO BE A
6276                                    DZ11.  IF ANY OF THE ABOVE FAILED;  UPDATING OF THE POINTER IS DONE  AND
6277                                    THE SEQUENCE IS REPEATED.
6278                                    NOTE:   IF THE PROGRAM DOES NOT FIND YOUR DZ11;  SOMETHING IS WRONG  AND
6279                                    AUTO SIZING SHOULD NOT BE DONE.
6280                                    AFTER IDENTIFYING A DZ11 THE PROGRAM THEN ATTEMPTS TO SET ALL DTR   BITS
6281                                    IN DEVICE REGISTER 4.   IF ANY DTR BITS DID SET THE MODULE IS ASSUMED TO
6282                                    BE AN EIA MODULE (M7819) OTHERWISE THE STATUS MAP ENTRY IS SET FOR  20MA
6283                                    (M7814).
6284
6285                            8.5.2   FINDING THE VECTOR
6286
6287                                    THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND
6288                                    '.+2'  (NEXT  ADDRESS).   BIT14 AND BIT5 (TX INTERUPT ENABLE AND MSTSCAN
6289                                    ENABLE) ARE SET INTO THE DZCSR.  "TCR07" IS THEN SET.  A DELAY  IS  MADE
6290                                    AND  IF  NO INTERUPT OCCURES (BECAUSE OF A BAD DZ11) THE PROG   ASSUMES
6291                                    VECTOR ADDRESS 300 AND THE PROBLEM SHOULD BE FIXED  IN  THE  DIAGNOSTIC.
6292                                    ONCE  THE PROBLEM IS FIXED;  THE PROGRAM SHOULD BE RE-SETUP AGAIN TO GET
6293                                    CORRECT VECTOR.  IF AN INTERUPT OCCURRED;  THE ADDRESS TO WHICH THE DZ11
6294                                    INTERUPTED  TO  IS  PICKED UP AND REPORTED AS THE VECTOR.  NOTE:  IF THE
6295                                    VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU;  THERE IS A PROBLEM AND
6296                                    AUTO SIZING SHOULD NOT BE DONE.
6297
6298                            8.5.3   PARAMETER ASSUMPTIONS.
6299
6300                                    SINCE TOO MUCH HARDWARE WOULD NEED TO BE TURNED ON TO SIZE THE  REST  OF
6301                                    THE  PARAMETERS;  THE PROGRAM MUST ASSUME THE REMAINING VARIATIONS.  THE
6302                                    RESULT IF NOT TO YOUR SPECIFIC CONFIGURATION  MAY  BE  ALTERED  BY  HAND
6303                                    (TOGGLE IN) IF DESIRED). IN THIS WAY 95 PERCENT OF THE PARAMETER SETUP
6304                                    WAS DONE BY THE PROGRAM, AND 5 PERCENT BY YOU.
6305                                    THEREFORE:
6306                                    1)      BUS PRIORITY IS SET TO LEVEL5.
6307                                    2)      ALL EIGHT LINES ARE ASSUMED TO BE TESTED.
6308                                    3)      DEFAULT BAUD RATE IS SET TO 16 (9600 BAUD).
6309                                    4)      MODE OF OPERATION IS "INTERNAL MODE'.
6310
6311                                FOR ALL PARAMETER ADJUSTMENTS PLEASE REFER TO SECTION 8.4A FOR GREATER DETAIL.
```

9.0 RUNNING THE DZ11 DIAGNOSTIC UNDER APT

9.1.1 THE APT INTERFACE

CZDZA HAS BEEN REDESIGNED TO BE COMPATIBLE WITH THE APT-AUTOMATED PRODUCT TEST SYSTEM. IT CAN BE RUN AS A STANDALONE DIAGNOSTIC OR IN EITHER OF THE APT MODES. CERTAIN VARIABLES IN THE ORIGINAL APT MODULE WERE REASSIGNED TO THE AREAS SET ASIDE FOR APT INTERFACING. THESE NEW VARIABLES GENERALLY BEGIN WITH A DOLLAR SIGN ($), E.G., $DEVM, $BASE.

9.1.2 SETTING UP THE DIAGNOSTIC USING APT

THE DIAGNOSTIC USES SEVERAL VARIABLES IN THE REGION SUBTITLED 'APT MAILBOX-ETABLE'. THESE VARIABLES ARE:

$SWREG - USED IF A SOFTWARE SWITCH REGISTER IS DESIRED WHILE UNDER APT

$VECT1 - USED TO SPECIFY THE INTERRUPT LEVEL AND THE FIRST VECTOR ADDRESS

$BASE - USED TO INDICATE BOTTOM ADDRESS OF DZ11 UNDER TEST

$DEVM - A BIT MAP REPRESENTING WHICH DZ11'S WILL BE TESTED

$CDW1 - USED TO INDICATE WHICH LINES TO RUN ON ALL DZ11'S

$DDW0 - EACH OF THE $DDW WORDS DESCRIBES THE PARAMETERS (LPR) FOR A PARTICULAR DZ11, GOING UP TO 16 DZ11'S

9.1.3 RUNNING UNDER APT

THE USER SHOULD BE FAMILIAR WITH THE APT SYSTEM. THE APT TIMING PARAMETERS FOR THE DZ11 DIAGNOSTIC WERE BASED ON AN 11/40 PROCESSOR. IT MAY BE NECESSARY TO ADD A FEW MORE SECONDS IF THE DIAGNOSTIC IS OUT ON AN 11/05 PROCESSOR.

ALL OF THE VARIABLES MENTIONED IN SECTION 9.1.2 SHOULD BE SET UP PRIOR TO RUNNING THE DIAGNOSTIC UNDER APT.

NOTE

BE SURE $BASE POINTS TO THE FIRST DZ11 BEFORE RUNNING

BASED ON THESE VALUES, THE DIAGNOSTIC WILL SET UP THE STATUS TABLE. THE USER IS THEN FREE TO MONITOR UNDER APT AS NORMAL.

```
6370
6371                                10.0    CHANGE HISTORY
6372
6373                                NOTE: HISTORY STARTS WITH REV. F0
6374
6375                                REV                     CHANGE DESCRIPTION
6376                                - -                     ------------------
6377
6378                                F0:             ALTER TRANSMITTER INTERRUPT SERVICE ROUTINE
6379                                        TO ALLOW MORE TIME FOR THE TCR BIT TO CLEAR BEFORE
6380                                        LOWERING THE BUS PRIORITY TO ENABLE DZ11 INTERRUPTS.
6381
6382                                G0:     MAY 1981 - INCORPORATE XON/XOFF FEATURES (BY ASSEMBLING WITH
6383                                        LATEST SYSMAC - C5) AND CHANGE ".=" CODE MODIFIERS AT END
6384                                        OF PROGRAM FROM ABSOLUTE ADDRESS MODE TO RELATIVE. ALSO, THE
6385                                        DEFAULT BAUD RATE WAS CHANGED TO 9600 BAUD, SINCE 19.2K BAUD IS
6386                                        NOT SUPPORTED, AND TEST 34 WAS CHANGED TO REMOVE 19.2K TESTING.
6387
6388                                H0:     JUNE 1984   ADDED BAUD RATE TIMING TEST.  ADDED IN ORDER
6389                                        TO TEST CRYSTAL SPEEDS.  TRANSMITTS CHARACTERS TO ALL 8 LINES
6390                                        AT ALL BAUD RATES (EXCEPT 19200 BAUD) FOR 1 SECOND AND IF THE
6391                                        NUMBER OF CHARACTERS TRANSMITTED IS WITHIN A RANGE, THE TEST
6392                                        WILL PASS.
6393
6394                            ⌘
8633
8634
8643                                                    ; -PRGFRT-================================
 (2)                            .TITLE  CZDZA-IO
 (2)                            ;*COPYRIGHT (C) 1976,1984,1985
 (2)                            ;*DIGITAL EQUIPMENT CORP.
 (2)                            ;*MAYNARD, MASS. 01754
 (2)                            ;*
 (2)                            ;*
 (2)                            ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
 (2)                            ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
 (2)                            ;*
 (2)     000001                 $TN=1
 (2)                                    ;STARTING PROCEDURE
 (2)                                    ;LOAD PROGRAM
 (2)                                    ;LOAD ADDRESS 000200
 (2)                                    ;PRESS START
 (2)                                    ;PROGRAM WILL TYPE "CZDZA-IO/<200>/CZDZAIO DZ11 LN ASYNC MUX TSTS "
 (2)                                    ;PROGRAM WILL TYPE "RUNNING" TO INDICATE THAT TESTING HAS STARTED
 (2)     -                              ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
 (2)                                    ;AND THEN RESUME TESTING
 (2)
 (2)                            .SBTTL  BASIC DEFINITIONS
 (2)
 (2)                            ;*INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***
 (2)     001120                 STACK=  1120
 (2)                            .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
 (2)                            .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
 (2)
 (2)                            ;*MISCELLANEOUS DEFINITIONS
 (2)     000011                 HT=     11              ;;CODE FOR HORIZONTAL TAB
```

```
(2)   000012   LF=      12              ;;CODE FOR LINE FEED
(2)   000015   CR=      15              ;;CODE FOR CARRIAGE RETURN
(2)   000200   CRLF=    200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
(2)   177776   PS=      177776          ;;PROCESSOR STATUS WORD
(2)            .EQUIV   PS,PSW
(2)   177774   STKLMT=  177774          ;;STACK LIMIT REGISTER
(2)   177772   PIRQ=    177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
(2)   177570   DSWR=    177570          ;;HARDWARE SWITCH REGISTER
(2)   177570   DDISP=   177570          ;;HARDWARE DISPLAY REGISTER
(2)
(2)            ;*GENERAL PURPOSE REGISTER DEFINITIONS
(2)   000000   R0=      %0              ;;GENERAL REGISTER
(2)   000001   R1=      %1              ;;GENERAL REGISTER
(2)   000002   R2=      %2              ;;GENERAL REGISTER
(2)   000003   R3=      %3              ;;GENERAL REGISTER
(2)   000004   R4=      %4              ;;GENERAL REGISTER
(2)   000005   R5=      %5              ;;GENERAL REGISTER
(2)   000006   R6=      %6              ;;GENERAL REGISTER
(2)   000007   R7=      %7              ;;GENERAL REGISTER
(2)   000006   SP=      %6              ;;STACK POINTER
(2)   000007   PC=      %7              ;;PROGRAM COUNTER
(2)
(2)            ;*PRIORITY LEVEL DEFINITIONS
(2)   000000   PR0=     0               ;;PRIORITY LEVEL 0
(2)   000040   PR1=     40              ;;PRIORITY LEVEL 1
(2)   000100   PR2=     100             ;;PRIORITY LEVEL 2
(2)   000140   PR3=     140             ;;PRIORITY LEVEL 3
(2)   000200   PR4=     200             ;;PRIORITY LEVEL 4
(2)   000240   PR5=     240             ;;PRIORITY LEVEL 5
(2)   000300   PR6=     300             ;;PRIORITY LEVEL 6
(2)   000340   PR7=     340             ;;PRIORITY LEVEL 7
(2)
(2)            ;*"SWITCH REGISTER" SWITCH DEFINITIONS
(2)   100000   SW15=    100000
(2)   040000   SW14=    40000
(2)   020000   SW13=    20000
(2)   010000   SW12=    10000
(2)   004000   SW11=    4000
(2)   002000   SW10=    2000
(2)   001000   SW09=    1000
(2)   000400   SW08=    400
(2)   000200   SW07=    200
(2)   000100   SW06=    100
(2)   000040   SW05=    40
(2)   000020   SW04=    20
(2)   000010   SW03=    10
(2)   000004   SW02=    4
(2)   000002   SW01=    2
(2)   000001   SW00=    1
(2)            .EQUIV   SW09,SW9
(2)            .EQUIV   SW08,SW8
(2)            .EQUIV   SW07,SW7
(2)            .EQUIV   SW06,SW6
(2)            .EQUIV   SW05,SW5
(2)            .EQUIV   SW04,SW4
(2)            .EQUIV   SW03,SW3
```

```
(2)                             .EQUIV  SW02,SW2
(2)                             .EQUIV  SW01,SW1
(2)                             .EQUIV  SW00,SW0
(2)
(2)                             ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(2)          100000             BIT15=  100000
(2)          040000             BIT14=  40000
(2)          020000             BIT13=  20000
(2)          010000             BIT12=  10000
(2)          004000             BIT11=  4000
(2)          002000             BIT10=  2000
(2)          001000             BIT09=  1000
(2)          000400             BIT08=  400
(2)          000200             BIT07=  200
(2)          000100             BIT06=  100
(2)          000040             BIT05=  40
(2)          000020             BIT04=  20
(2)          000010             BIT03=  10
(2)          000004             BIT02=  4
(2)          000002             BIT01=  2
(2)          000001             BIT00=  1
(2)                             .EQUIV  BIT09,BIT9
(2)                             .EQUIV  BIT08,BIT8
(2)                             .EQUIV  BIT07,BIT7
(2)                             .EQUIV  BIT06,BIT6
(2)                             .EQUIV  BIT05,BIT5
(2)                             .EQUIV  BIT04,BIT4
(2)                             .EQUIV  BIT03,BIT3
(2)                             .EQUIV  BIT02,BIT2
(2)                             .EQUIV  BIT01,BIT1
(2)                             .EQUIV  BIT00,BIT0
(2)
(2)                             ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(2)          000004             ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
(2)          000010             RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
(2)          000014             TBITVEC=14              ;;"T" BIT
(2)          000014             TRTVEC= 14              ;;TRACE TRAP
(2)          000014             BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
(2)          000020             IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(2)          000024             PWRVEC= 24              ;;POWER FAIL
(2)          000030             EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
(2)          000034             TRAPVEC=34              ;;"TRAP" TRAP
(2)          000060             TKVEC=  60              ;;TTY KEYBOARD VECTOR
(2)          000064             TPVEC=  64              ;;TTY PRINTER VECTOR
(2)          000240             PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
(1)
(1)
(1)                             ;INSTRUCTION DEFINITIONS
(1)                             ;- --------------------
(1)
(1)          005746             PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
(1)          005726             POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
(1)          010046             PUSHR0=10046    ;SAVE R0 ON STACK
(1)          012600             POPR0=12600     ;RESTORE R0 FROM STACK
(1)          024646             PUSH2SP=24646   ;DECREMENT STACK TWICE
(*)          022626             POP2SP=22626    ;INCREMENT STACK TWICE
```

```
(1)
(1)                                     ;DZ11 CONTROL AND STATUS REGISTER DEFINITIONS
(1)                                     ;(DZCSR)        BIT DEFINITIONS
(1)                                     ;------------------------------
(1)
(1)          000010                     MAINT = BIT3     ;MAINTENANCE MODE ENABLE
(1)          000020                     DCLR=BIT4        ;DEVICE CLEAR
(1)          000040                     MSENAB=BIT5      ;MASTER SCAN ENABLE
(1)          000100                     RIE=BIT6         ;RECEIVER INTERRUPT ENABLE
(1)          000200                     RDONE=BIT7       ;RECEIVER DONE
(1)          010000                     SILOEN= BIT12    ;SILO ALARM ENABLE
(1)          020000                     SILOAL = BIT13   ;SILO ALARM
(1)          040000                     TIE=BIT14        ;TRANSMITTER INTERRUPT ENABLE
(1)          100000                     TRDY=BIT15       ;TRANSMITTER READY
(1)
(1)          000021                     $XON=21
(1)          000023                     $XOFF=23
(1)
(1)                                     ;DZCSR WORD DEFINITIONS
(1)                                     ;--- -----------------
(1)          000000                     TL0=0            ;TRANSMIT LINE 0
(1)          000400                     TL1=BIT8         ;TRANSMIT LINE 1
(1)          001000                     TL2=BIT9         ;TRANSMIT LINE 2
(1)          001400                     TL3=BIT9!BIT8    ;TRANSMIT LINE 3
(1)          002000                     TL4=BIT10        ;TRANSMIT LINE 4
(1)          002400                     TL5=BIT10!BIT8   ;TRANSMIT LINE 5
(1)          003000                     TL6=BIT10!BIT9   ;TRANSMIT LINE 6
(1)          003400                     TL7=BIT10!BIT9!BIT8 ;TRANSMIT LINE 7
(1)
(1)
(1)                                     ;DZRBUF BIT DEFINITIONS
(1)                                     ;--------------- ---
(1)
(1)          010000                     PARER=BIT12      ;PARITY ERROR
(1)          020000                     FRMERR=BIT13     ;FRAME ERROR
(1)          040000                     OVRRUN=BIT14     ;OVERRUN ERROR
(1)          100000                     DVALID=BIT15     ;DATA VALID
(1)
(1)                                     ;DZRBUF WORD DEFINITIONS
(1)                                     ; - -------------  ----
(1)
(1)          000000                     RL0=0            ;RECEIVER LINE 0
(1)          000400                     RL1=BIT8         ;RECEIVER LINE 1
(1)          001000                     RL2=BIT9         ;RECEIVER LINE 2
(1)          001400                     RL3=BIT9!BIT8    ;RECEIVER LINE 3
(1)          002000                     RL4=BIT10        ;RECEIVER LINE 4
(1)          002400                     RL5=BIT10!BIT8   ;RECEIVER LINE 5
(1)          003000                     RL6=BIT10!BIT9   ;RECEIVER LINE 6
(1)          003400                     RL7=BIT10!BIT9!BIT8 ;RECEIVER LINE 7
(1)
(1)                                     ;DZLPR WORD DEFINITIONS
(1)                                     ;----------------------
(1)
(1)          000000                     LP0=0            ;LINE PARAMETER 0
(1)          000001                     LP1=BIT0         ;LINE PARAMETER 1
(1)          000002                     LP2=BIT1         ;LINE PARAMETER 2
```

```
(1)          000003                  LP3=BIT1!BIT0    ;LINE PARAMETER 3
(1)          000004                  LP4=BIT2         ;LINE PARAMETER 4
(1)          000005                  LP5=BIT2!BIT0    ;LINE PARAMETER 5
(1)          000006                  LP6=BIT2!BIT1    ;LINE PARAMETER 6
(1)          000007                  LP7=BIT2!BIT1!BIT0      ;LINE PARAMETER 7
(1)
(1)          000000                  FIVE=0           ;FIVE BITS/CHAR,1 STOP BIT
(1)          000010                  SIX=BIT3         ;SIX BITS/CHAR,1 STOP BIT
(1)          000020                  SEVEN=BIT4       ;SEVEN BITS/CHAR,1 STOP BIT
(1)          000030                  EIGHT=BIT4!BIT3 ;EIGHT BITS/CHAR,1 STOP BIT
(1)          000040                  FIVES=BIT5       ;FIVE BITS/CHAR,2 STOP BITS
(1)          000050                  SIXS=BIT5!BIT3   ;SIX BITS/CHAR,2 STOP BITS
(1)          000060                  SEVENS=BIT5!BIT4         ;SEVEN BITS/CHAR, 2 STOP BITS
(1)          000070                  EIGHTS=BIT5!BIT4!BIT3    ;EIGHT BITS/CHAR, 2 STOP BITS
(1)
(1)          000100                  PARITY=BIT6              ;PARITY ENABLED
(1)          000200                  ODDPAR=BIT7              ;ODD PARITY ENABLED
(1)          000000                  ONESTOP=0                ;ONE STOP BIT ENABLED
(1)          000040                  TWOSTOP=BIT5             ;TWO STOP BITS ENABLED
(1)          000000                  EVEPAR=0                 ;EVEN PARITY ENABLED
(1)          010000                  RCVON=BIT12              ;ENABLE RECEIVER (RECEIVER ON)
(1)
(1)          000000                  S50=0                    ;SPEED 50 BAUD
(1)          000400                  S75=BIT8                 ;SPEED 75 BAUD
(1)          001000                  S110=BIT9                ;SPEED 110 BAUD
(1)          001400                  S134=BIT9!BIT8           ;SPEED 134.5 BAUD
(1)          002000                  S150=BIT10               ;SPEED 150 BAUD
(1)          002400                  S300=BIT10!BIT8          ;SPEED 300 BAUD
(1)          003000                  S600=BIT10!BIT9          ;SPEED 600 BAUD
(1)          003400                  S1200=BIT10!BIT9!BIT8    ;SPEED 1200 BAUD
(1)          004000                  S1800=BIT11              ;SPEED 1800 BAUD
(1)          004400                  S2000=BIT11!BIT8         ;SPEED 2000 BAUD
(1)          005000                  S2400=BIT11!BIT9         ;SPEED 2400 BAUD
(1)          005400                  S3600=BIT11!BIT9!BIT8    ;SPEED 3600 BAUD
(1)          006000                  S4800=BIT11!BIT10        ;SPEED 4800 BAUD
(1)          006400                  S7200=BIT11!BIT10!BIT8   ;SPEED 7200 BAUD
(1)          007000                  S9600=BIT11!BIT10!BIT9   ;SPEED 9600 BAUD
(1)          007400                  S19200=BIT11!BIT10!BIT9!BIT8     ;SPEED 19200 BAUD
(1)
(1)                                  ;DZTCR BIT DEFINITIONS
(1)                                  ;---------------------
(1)          000001                  TCR0=BIT0                ;TCR0
(1)          000002                  TCR1=BIT1                ;TCR1
(1)          000004                  TCR2=BIT2                ;TCR2
(1)          000010                  TCR3=BIT3                ;TCR3
(1)          000020                  TCR4=BIT4                ;TCR4
(1)          000040                  TCR5=BIT5                ;TCR5
(1)          000100                  TCR6=BIT6                ;TCR6
(1)          000200                  TCR7=BIT7                ;TCR7
(1)          000400                  DTR0=BIT8                ;DTR0
(1)          001000                  DTR1=BIT9                ;DTR1
(1)          002000                  DTR2=BIT10               ;DTR2
(1)          004000                  DTR3=BIT11               ;DTR3
(1)          010000                  DTR4=BIT12               ;DTR4
(1)          020000                  DTR5=BIT13               ;DTR5
(1)          040000                  DTR6=BIT14               ;DTR6
```

```
(1)          100000                  DTR7=BIT15                  ;DTR7
(1)
(1)                                          ;DZMSR BIT DEFINITIONS
(1)                                          ;---------------------
(1)          000001                  RING0=BIT0                  ;RING INDICATED ON LINE 0
(1)          000002                  RING1=BIT1                  ;RING INDICATED ON LINE 1
(1)          000004                  RING2=BIT2                  ;RING INDICATED ON LINE 2
(1)          000010                  RING3=BIT3                  ;RING INDICATED ON LINE 3
(1)          000020                  RING4=BIT4                  ;RING INDICATED ON LINE 4
(1)          000040                  RING5=BIT5                  ;RING INDICATED ON LINE 5
(1)          000100                  RING6=BIT6                  ;RING INDICATED ON LINE 6
(1)          000200                  RING7=BIT7                  ;RING INDICATED ON LINE 7
(1)          000400                  CO0=BIT8                    ;CARRIER PRESENT ON LINE 0
(1)          001000                  CO1=BIT9                    ;CARRIER PRESENT ON LINE 1
(1)          002000                  CO2=BIT10                   ;CARRIER PRESENT ON LINE 2
(1)          004000                  CO3=BIT11                   ;CARRIER PRESENT ON LINE 3
(1)          010000                  CO4=BIT12                   ;CARRIER PRESENT ON LINE 4
(1)          020000                  CO5=BIT13                   ;CARRIER PRESENT ON LINE 5
(1)          040000                  CO6=BIT14                   ;CARRIER PRESENT ON LINE 6
(1)          100000                  CO7=BIT15                   ;CARRIER PRESENT ON LINE 7
(1)
(1)                                          ;DZTDR BIT DEFINITIONS
(1)                                          ;---------------------
(1)
(1)          000400                  BRK0=BIT8                   ;BREAK FOR LINE 0
(1)          001000                  BRK1=BIT9                   ;BREAK FOR LINE 1
(1)          002000                  BRK2=BIT10                  ;BREAK FOR LINE 2
(1)          004000                  BRK3=BIT11                  ;BREAK FOR LINE 3
(1)          010000                  BRK4=BIT12                  ;BREAK FOR LINE 4
(1)          020000                  BRK5=BIT13                  ;BREAK FOR LINE 5
(1)          040000                  BRK6=BIT14                  ;BREAK FOR LINE 6
(1)          100000                  BRK7=BIT15                  ;BREAK FOR LINE 7
(1)
(1)
(1)                                  ;TABLE OF LOOP AROUND FUNCTIONS (H325)
(1)                                  ;
(1)                                  ;       -----------------
(1)                                  ;       I                 ↑
(1)                                  ;       V                 ↑
(1)                                  ;       REC               TRANS
(1)                                  ;       DATA              DATA
(1)                                  ;
(1)                                  ;       -----------------
(1)                                  ;       I                 ↑
(1)                                  ;       V                 ↑
(1)                                  ;       CO                RTS
(1)                                  ;
(1)                                  ;
(1)                                  ;       ----- -----------
(1)                                  ;       I                 ↑
(1)                                  ;       V                 ↑
(1)                                  ;       RING              DTR
```

```
(1)                             ;;*****************************************************************************
(1)                             ;-----------------------------------------------------------------------------
(1)                                     ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
(1)                                     ;THE STANDARD "TRAP CATCHER" IS PLACED
(1)                                     ;BETWEEN ADDRESS 0 TO ADDRESS 776.
(1)                                     ;IT LOOKS LIKE "MOV PC,-(SP)  HALT".
(1)                             ; -------- ---- ------- -------------------------------------------------
(1)                             ;;*****************************************************************************
(1)
(1)             000000          .=0
(1)                                     ;STANDARD INTERRUPT VECTORS
(1)                                     ;-------- ---- ---- -------
(1)
(1)             000010          .=10
(1)     000010  011430                  SET.PS                  ;FAKE "MTPS" INSTRUCTION TRAP
(1)     000012  000340                  PR7                     ;MAKE SURE PS IS PRIORITY 7
(1)
(1)             000020          .=20
(1)     000020  005122                  .SCOPE                  ;SCOPE LOOP HANDLER
(1)     000022  000340                  PR7                     ;HANDLE AT PRIORITY 7
(1)     000024  010310                  $PWRDN                  ;POWER FAIL HANDLER
(1)     000026  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(1)     000030  007220                  $ERROR                  ;ERROR HANDLER
(1)     0C0032  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(1)     000034  007112                  .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
(1)     000036  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(2)                             .SBTTL  ACT11 HOOKS
(2)
(3)
(2)                             ;;*****************************************************************
(2)                             ;HOOKS REQUIRED BY ACT11
(2)             000040                  $SVPC=.                 ;SAVE PC
(2)             000046                  .=46
(2)     000046  005056                  $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
(2)             000052                  .=52
(2)     000052  000000                  .WORD   0               ;;2)SET LOC.52 TO ZERO
(2)             000040                  .=$SVPC                 ;; RESTORE PC
(1)
(1)             000174          .=174
(1)     000174  000000          DISPREG:0                       ;SOFTWARE DISPLAY REGISTER FOR SWITCHLESS 11S
(1)     000176  000000          SWREG:  0                       ;SOFTARE SWITCH REGISTER FOR SWITCHLESS 11S
(1)             000200          .=200
(1)     000200  000137  002150          JMP     .START          ;GO TO START OF PROGRAM
(1)             000210          .=210
(1)     000210  000137  025244          JMP     XSTART          ;GOTO CABLE TEST/ECHO TEST
(1)
(2)
(2)             001000          .=1000
(2)     001000  00520C  055103  055104  MTITLE: .ASCIZ  <200><12>/CZDZA IO/<200>/CZDZAIO DZ11 LN ASYNC MUX TSTS /<200>
(2)
```

```
(3)                                     .SBTTL  COMMON TAGS
(3)
(4)                                     ;;**********************************************************************
(3)                                     ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
(3)                                     ;*USED IN THE PROGRAM.
(3)
(3)          001120                             .=1120
(3)  001120                             $CMTAG:                         ;;START OF COMMON TAGS
(3)  001120  000000                             .WORD   0
(3)  001122     000                     $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
(3)  001123     000                     $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
(3)  001124  000000                     $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
(3)  001126  000000                     $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
(3)  001130  000000                     $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
(3)  001132  000000                     $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
(3)  001134     000                     $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
(3)  001135     001                     $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
(3)  001136  000000                     $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
(3)  001140  000000                     $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
(3)  001142  000000                     $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
(3)  001144  000000                     $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
(3)  001146  000000                     $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
(3)  001150  000000                             .WORD   0               ;;RESERVED--NOT TO BE USED
(3)  001152  000000                             .WORD   0
(3)  001154     000                     $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
(3)  001155     000                     $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
(3)  001156  000000                             .WORD   0
(3)  001160  177570                     SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
(3)  001162  177570                     DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
(3)  001164  177560                     $TKS:   177560                  ;;TTY KBD STATUS
(3)  001166  177562                     $TKB:   177562                  ;;TTY KBD BUFFER
(3)  001170  177564                     $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
(3)  001172  177566                     $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
(3)  001174     000                     $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
(3)  001175     002                     $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
(3)  001176     012                     $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
(3)  001177     000                     $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
(3)  001200  000000                     $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
(3)                                                                     ;;WHICH  ($REG0) WAS OBTAINED
(5)  001202  000000                     $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
(5)  001204  000000                     $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
(5)  001206  000000                     $REG2:  .WORD   0               ;;CONTAINS (($REGAD)+4)
(5)  001210  000000                     $REG3:  .WORD   0               ;;CONTAINS (($REGAD)+6)
(5)  001212  000000                     $REG4:  .WORD   0               ;;CONTAINS (($REGAD)+10)
(5)  001214  000000                     $REG5:  .WORD   0               ;;CONTAINS (($REGAD)+12)
(5)  001216  000000                     $TMP0:  .WORD   0               ;;USER DEFINED
(5)  001220  000000                     $TMP1:  .WORD   0               ;;USER DEFINED
(5)  001222  000000                     $TMP2:  .WORD   0               ;;USER DEFINED
(5)  001224  000000                     $TMP3:  .WORD   0               ;;USER DEFINED
(3)  001226  000000                     $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
(3)  001230     077                     $QUES:  .ASCII  /?/             ;;QUESTION MARK
(3)  001231     015                     $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
(3)  001232  000012                     $LF:    .ASCIZ  <12>            ;;LINE FEED
(4)                                     ;;**********************************************************************
(4)                                     .SBTTL  APT MAILBOX-ETABLE
(4)
```

```
(5)                                 ;;*****************************************************************
(4)                                 .EVEN
(4)  001234                         $MAIL:                      ;;APT MAILBOX
(4)  001234  000000                 $MSGTY: .WORD   AMSGTY      ;;MESSAGE TYPE CODE
(4)  001236  000000                 $FATAL: .WORD   AFATAL      ;;FATAL ERROR NUMBER
(4)  001240  000000                 $TESTN: .WORD   ATESTN      ;;TEST NUMBER
(4)  001242  000000                 $PASS:  .WORD   APASS       ;;PASS COUNT
(4)  001244  000000                 $DEVCT: .WORD   ADEVCT      ;;DEVICE COUNT
(4)  001246  000000                 $UNIT:  .WORD   AUNIT       ;;I/O UNIT NUMBER
(4)  001250  000000                 $MSGAD: .WORD   AMSGAD      ;;MESSAGE ADDRESS
(4)  001252  000000                 $MSGLG: .WORD   AMSGLG      ;;MESSAGE LENGTH
(4)  001254                         $ETABLE:                    ;;APT ENVIRONMENT TABLE
(4)  001254     000                 $ENV:   .BYTE   AENV        ;;ENVIRONMENT BYTE
(4)  001255     000                 $ENVM:  .BYTE   AENVM       ;;ENVIRONMENT MODE BITS
(4)  001256  000000                 $SWREG: .WORD   ASWREG      ;;APT SWITCH REGISTER
(4)  001260  000000                 $USWR:  .WORD   AUSWR       ;;USER SWITCHES
(4)  001262  000000                 $CPUOP: .WORD   ACPUOP      ;;CPU TYPE,OPTIONS
(4)                                 ;*                          BITS 15-11=CPU TYPE
(4)                                 ;*                                  11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
(4)                                 ;*                                  11/70=06,PDQ=07,Q=10
(4)                                 ;*                          BIT 10=REAL TIME CLOCK
(4)                                 ;*                          BIT  9=FLOATING POINT PROCESSOR
(4)                                 ;*                          BIT  8=MEMORY MANAGEMENT
(4)  0C1264     000                 $MAMS1: .BYTE   AMAMS1      ;;HIGH ADDRESS,M.S. BYTE
(4)  001265     000                 $MTYP1: .BYTE   AMTYP1      ;;MEM. TYPE,BLK#1
(4)                                 ;*                          MEM.TYPE BYTE   --  (HIGH BYTE)
(4)                                 ;*                                  900 NSEC CORE=001
(4)                                 ;*                                  300 NSEC BIPOLAR=002
(4)                                 ;*                                  500 NSEC MOS=003
(4)  001266  000000                 $MADR1: .WORD   AMADR1      ;;HIGH ADDRESS,BLK#1
(4)                                 ;*                            MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
(4)  001270     000                 $MAMS2: .BYTE   AMAMS2      ;;HIGH ADDRESS,M.S. BYTE
(4)  001271     000                 $MTYP2: .BYTE   AMTYP2      ;;MEM.TYPE,BLK#2
(4)  001272  000000                 $MADR2: .WORD   AMADR2      ;;MEM.LAST ADDRESS,BLK#2
(4)  001274     000                 $MAMS3: .BYTE   AMAMS3      ;;HIGH ADDRESS,M.S.BYTE
(4)  001275     000                 $MTYP3: .BYTE   AMTYP3      ;;MEM.TYPE,BLK#3
(4)  001276  000000                 $MADR3: .WORD   AMADR3      ;;MEM.LAST ADDRESS,BLK#3
(4)  001300     000                 $MAMS4: .BYTE   AMAMS4      ;;HIGH ADDRESS,M.S.BYTE
(4)  001301     000                 $MTYP4: .BYTE   AMTYP4      ;;MEM.TYPE,BLK#4
(4)  001302  000000                 $MADR4: .WORD   AMADR4      ;;MEM.LAST ADDRESS,BLK#4
(4)  001304  000000                 $VECT1: .WORD   AVECT1      ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
(4)  001306  000000                 $VECT2: .WORD   AVECT2      ;;INTERRUPT VECTOR#2BUS PRIORITY#2
(4)  001310  160010                 $BASE:  .WORD   ABASE       ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
(4)  001312  000000                 $DEVM:  .WORD   ADEVM       ;;DEVICE MAP
(4)  001314  000000                 $CDW1:  .WORD   ACDW1       ;;CONTROLLER DESCRIPTION WORD#1
(4)  001316  000000                 $CDW2:  .WORD   ACDW2       ;;CONTROLLER DESCRIPTION WORD#2
(4)  001320  000000                 $DDW0:  .WORD   ADDW0       ;;DEVICE DESCRIPTOR WORD#0
(4)  001322  000000                 $DDW1:  .WORD   ADDW1       ;;DEVICE DESCRIPTOR WORD#1
(4)  001324  000000                 $DDW2:  .WORD   ADDW2       ;;DEVICE DESCRIPTOR WORD#2
(4)  001326  000000                 $DDW3:  .WORD   ADDW3       ;;DEVICE DESCRIPTOR WORD#3
(4)  001330  000000                 $DDW4:  .WORD   ADDW4       ;;DEVICE DESCRIPTOR WORD#4
(4)  001332  000000                 $DDW5:  .WORD   ADDW5       ;;DEVICE DESCRIPTOR WORD#5
(4)  001334  000000                 $DDW6:  .WORD   ADDW6       ;;DEVICE DESCRIPTOR WORD#6
(4)  001336  000000                 $DDW7:  .WORD   ADDW7       ;;DEVICE DESCRIPTOR WORD#7
(4)  001340  000000                 $DDW8:  .WORD   ADDW8       ;;DEVICE DESCRIPTOR WORD#8
(4)  001342  000000                 $DDW9:  .WORD   ADDW9       ;;DEVICE DESCRIPTOR WORD#9
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(4)  001344  000000                $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
(4)  001346  000000                $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
(4)  001350  000000                $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
(4)  001352  000000                $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
(4)  001354  000000                $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
(4)  001356  000000                $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
(4)
(4)
(4)  001360                        $ETEND:
(4)
```

```
(3)                                  SBTTL  ERROR POINTER TABLE
(3)
(3)                                 ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(3)                                 ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(3)                                 ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(3)                                 ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
(3)                                 ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(3)
(3)                                 ;*      EM              ;;POINTS TO THE ERROR MESSAGE
(3)                                 ;*      DH              ;;POINTS TO THE DATA HEADER
(3)                                 ;*      DT              ;;POINTS TO THE DATA
(3)                                 ;*      DF              ;;POINTS TO THE DATA FORMAT
(3)
(3)
(3)  001360                         $ERRTB:
(2)
(2)                                         ;PROGRAM CONTROL PARAMETERS
(2)                                         ;--------      ---  -   - --
(2)
(2)  001360  000000                 NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
(2)  001362  000000                 LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
(2)
(2)                                         ;PROGRAM VARIABLES
(2)                                         ;-------- -------
(2)
(2)  001364  000377                 LINE:   377                     ;DEFAULT ALL EIGHT LINES RUNNING
(2)  001366  017070                 PAR:    17070                   ;PARAMETERS: 8 BITS/CHAR,2 STOP BITS, 9600 BAUD,NO PARIT
(2)  001370  000000                 MODE:   0                       ;DEFAULT MAINTENANCE MODE
(2)  001372  000000                 SAVLIN: 0                       ;LINE NUMBER
(2)  001374  000000                 XMTLIN: 0                       ;TRANSMISSION LINE NUMBER
(2)  001376  000000                 XMTCNT: 0                       ;COUNT OF WORDS IN A TRANSMISSION PATTERN
(2)  001400  000000                 REGIST: 0                       ;DEVICE ADDRESS STORAGE LOCATION
(2)  001402  000000                 SAVPC:  0                       ;PROGRAM COUNTER STORAGE
(2)  001404  000001                 DZACTV: .BLKW   1               ;*DZ11'S SELECTED ACTIVE.
(2)  001406  000001                 RUN:    1                       ;*POINTER ONE PAST RUNNING DEVICE.
(2)  001410  000001                 DZNUM:  .BLKB 1                 ;*OCTAL NUMBER OF DZ11'S.
(2)  001411     001                 SAVNUM: .BYTE 1                 ;*WORKABLE NUMBER.
(2)                                 .EVEN
(2)  001412  001500                 ACTIVE: DZ.MAP                  ;TABLE POINTER.
```

```
(2)
(2)                                     ;PROGRAM CONTROL FLAGS
(2)                                     ;- - ---   - ---------
(2)
(2)  001414     000             EIAFLG: .BYTE   0               ;0=EIA  100000=20MA
(2)  001415     000             INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
(2)  001416     000             HDRFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG FOR HEADER MAP
(2)  001417     000             MNTFLG: .BYTE   0               ;MAINTENANCE BIT SET FLAG
(2)  001420     000             DONFLG: .BYTE   0               ;TRANSMISSION COMPLETION FLAG
(2)          001422             .EVEN
(2)                             ;DATA VARIABLES
(2)  001422  000000             TD0:    .WORD   0
(2)  001424  000000             TD1:    .WORD   0
(2)  001426  000000             TD2:    .WORD   0
(2)  001430  000000             TD3:    .WORD   0
(2)  001432  000000             TD4:    .WORD   0
(2)  001434  000000             TD5:    .WORD   0
(2)  001436  000000             TD6:    .WORD   0
(2)  001440  000000             TD7:    .WORD   0
(2)  001442  000000             TR0:    .WORD   0
(2)  001444  000000             TR1:    .WORD   0
(2)  001446  000000             TR2:    .WORD   0
(2)  001450  000000             TR3:    .WORD   0
(2)  001452  000000             TR4:    .WORD   0
(2)  001454  000000             TR5:    .WORD   0
(2)  001456  000000             TR6:    .WORD   0
(2)  001460  000000             TR7:    .WORD   0
(2)  001462                     STOP:
(2)                             ;  - END 0 MACRO ==================
(2)                             .SBTTL  APT PARAMETER BLOCK
(2)
(3)                             ;;**********************************************************************
(2)                             ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(3)                             ;;**********************************************************************
(2)          001462                     .$X=.    ;;SAVE CURRENT LOCATION
(2)          000024                     .=24     ;;SET POWER FAIL TO POINT TO START OF PROGRAM
(2)  000024  000200                     200      ;;FOR APT START UP
(2)          000044                     .=44     ;;POINT TO APT INDIRECT ADDRESS PNTR.
(2)  000044  001462                     $APTHDR  ;;POINT TO APT HEADER BLOCK
(2)          001462                     .=.$X    ;;RESET LOCATION COUNTER
(3)                             ;;**********************************************************************
(2)                             ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
(2)                             ;INTERFACE SPEC.
(2)
(2)  001462                     $APTHD:
(2)  001462  000000             $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
(2)  001464  001234             $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0 15)
(2)  001466  000132             $TSTM:  .WORD   90.     ;;RUN TIM OF LONGEST TEST
(2)  001470  000137             $PASTM: .WORD   95.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
(2)  001472  000137             $UNITM: .WORD   95.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
(2)  001474  000052                     .WORD   $ETEND $MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
(1)                             ;DZ11 STATUS TABLE AND ADDRESS ASSIGNMENTS
(1)                             ;-- ----------- -   ---------- -   - ---
(1)
(1)          001500             .=1500
(1)  001500                     DZ.MAP:
```

```
(3)                                                     ; -$JUNK ***********************************
(3)
(3)  001500  000001             DZCR0:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 0
(3)  001502  000001             DZVC0:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 0
(3)  001504  000001             DZLV0:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001506  000001             LINE0:   .BLKW   1     ;ALL LINES SELECTED
(3)  001510  000001             PAR0:    .BLKW   1     ;PARAMETERS
(3)  001512  000001             MANT0:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ; -- END 0 MACRO ******************
(3)                                                     ; -$JUNK-***********************************
(3)
(3)  001514  000001             DZCR1:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 1
(3)  001516  000001             DZVC1:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 1
(3)  001520  000001             DZLV1:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001522  000001             LINE1:   .BLKW   1     ;ALL LINES SELECTED
(3)  001524  000001             PAR1:    .BLKW   1     ;PARAMETERS
(3)  001526  000001             MANT1:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ;    END 0 MACRO ******************
(3)                                                     ; -$JUNK-***********************************
(3)
(3)  001530  000001             DZCR2:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 2
(3)  001532  000001             DZVC2:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 2
(3)  001534  000001             DZLV2:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001536  000001             LINE2:   .BLKW   1     ;ALL LINES SELECTED
(3)  001540  000001             PAR2:    .BLKW   1     ;PARAMETERS
(3)  001542  000001             MANT2:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ; -- END 0 MACRO ******************
(3)                                                     ;  $JUNK-***********************************
(3)
(3)  001544  000001             DZCR3:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 3
(3)  001546  000001             DZVC3:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 3
(3)  001550  000001             DZLV3:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001552  000001             LINE3:   .BLKW   1     ;ALL LINES SELECTED
(3)  001554  000001             PAR3:    .BLKW   1     ;PARAMETERS
(3)  001556  000001             MANT3:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ;  - END 0 MACRO ******************
(3)                                                     ; -$JUNK-***********************************
(3)
(3)  001560  000001             DZCR4:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 4
(3)  001562  000001             DZVC4:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 4
(3)  001564  000001             DZLV4:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001566  000001             LINE4:   .BLKW   1     ;ALL LINES SELECTED
(3)  001570  000001             PAR4:    .BLKW   1     ;PARAMETERS
(3)  001572  000001             MANT4:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ; -- END 0 MACRO ******************
(3)                                                     ;  $JUNK-***********************************
(3)
(3)  001574  000001             DZCR5:   .BLKW   1     ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 5
(3)  001576  000001             DZVC5:   .BLKW   1     ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 5
(3)  001600  000001             DZLV5:   .BLKW   1     ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001602  000001             LINE5:   .BLKW   1     ;ALL LINES SELECTED
(3)  001604  000001             PAR5:    .BLKW   1     ;PARAMETERS
(3)  001606  000001             MANT5:   .BLKW   1     ;MAINTENANCE MODE FOR THIS DEVICE
(3)                              ;  - END 0 MACRO ******************
(3)                                                     ;  $JUNK-***********************************
(3)
```

```
(3)  001610  000001                DZCR6:   .BLKW   1        ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 6
(3)  001612  000001                DZVC6:   .BLKW   1        ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 6
(3)  001614  000001                DZLV6:   .BLKW   1        ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001516  000001                LINE6:   .BLKW   1        ;ALL LINES SELECTED
(3)  001620  000001                PAR6:    .BLKW   1        ;PARAMETERS
(3)  001622  000001                MANT6:   .BLKW   1        ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -- END 0 MACRO ******************
(3)                                                          ; -$JUNK-************************************
(3)
(3)  001624  000001                DZCR7:   .BLKW   1        ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 7
(3)  001626  000001                DZVC7:   .BLKW   1        ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 7
(3)  001630  000001                DZLV7:   .BLKW   1        ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001632  000001                LINE7:   .BLKW   1        ;ALL LINES SELECTED
(3)  001634  000001                PAR7:    .BLKW   1        ;PARAMETERS
(3)  001636  000001                MANT7:   .BLKW   1        ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -- END 0 MACRO ******************
(3)                                                          ;  $JUNK-*************************************
(3)
(3)  001640  000001                DZCR10: .BLKW   1         ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 10
(3)  001642  000001                DZVC10: .BLKW   1         ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 10
(3)  001644  000001                DZLV10: .BLKW   1         ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001646  000001                LINE10: .BLKW   1         ;ALL LINES SELECTED
(3)  001650  000001                PAR10:  .BLKW   1         ;PARAMETERS
(3)  001652  000001                MANT10: .BLKW   1         ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ;  - END 0 MACRO ********-**********
(3)                                                          ; -$JUNK-************************************
(3)
(3)  001654  000001                DZCR11: .BLKW   1         ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 11
(3)  001656  000001                DZVC11: .BLKW   1         ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 11
(3)  001660  000001                DZLV11: .BLKW   1         ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001662  000001                LINE11: .BLKW   1         ;ALL LINES SELECTED
(3)  001664  000001                PAR11:  .BLKW   1         ;PARAMETERS
(3)  001666  000001                MANT11: .BLKW   1         ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -- END 0 MACRO ******************
(3)                                                          ; -$JUNK-*********-************************-*********
(3)
(3)  001670  000001                DZCR12: .BLKW   1         ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 12
(3)  001672  000001                DZVC12: .BLKW   1         ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 12
(3)  001674  000001                DZLV12: .BLKW   1         ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001676  000001                LINE12: .BLKW   1         ;ALL LINES SELECTED
(3)  001700  000001                PAR12:  .BLKW   1         ;PARAMETERS
(3)  001702  000001                MANT12: .BLKW   1         ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ;    END 0 MACRO ******************
(3)                                                          ; -$JUNK *********-*****************************
(3)
(3)  001704  000001                DZCR13: .BLKW   1         ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 13
(3)  001706  000001                DZVC13: .BLKW   1         ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 13
(3)  001710  000001                DZLV13: .BLKW   1         ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001712  000001                LINE13: .BLKW   1         ;ALL LINES SELECTED
(3)  001714  000001                PAR13:  .BLKW   1         ;PARAMETERS
(3)  001716  000001                MANT13: .BLKW   1         ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -- END 0 MACRO ******************
(3)                                                          ;  $JUNK-*********************-**-***********
(3)
(3)  001720  000001                DZCR14: .BLKW   1         ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 14
(3)  001722  000001                DZVC14: .BLKW   1         ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 14
```

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(3)  001724  000001                DZLV14: .BLKW   1       ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001726  000001                LINE14: .BLKW   1       ;ALL LINES SELECTED
(3)  001730  000001                PAR14:  .BLKW   1       ;PARAMETERS
(3)  001732  000001                MANT14: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -- END O MACRO ******************
(3)                                                        ; -$JUNK-************************************
(3)
(3)  001734  000001                DZCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 15
(3)  001736  000001                DZVC15: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 15
(3)  001740  000001                DZLV15: .BLKW   1       ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001742  000001                LINE15: .BLKW   1       ;ALL LINES SELECTED
(3)  001744  000001                PAR15:  .BLKW   1       ;PARAMETERS
(3)  001746  000001                MANT15: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -  END O MACRO ******************
(3)                                                        ; -$JUNK-************************************
(3)
(3)  001750  000001                DZCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 16
(3)  001752  000001                DZVC16: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 16
(3)  001754  000001                DZLV16: .BLKW   1       ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001756  000001                LINE16: .BLKW   1       ;ALL LINES SELECTED
(3)  001760  000001                PAR16:  .BLKW   1       ;PARAMETERS
(3)  001762  000001                MANT16: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)                                ; -  END O MACRO ******************
(3)                                                        ; -$JUNK-************************************
(3)
(3)  001764  000001                DZCR17: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZ11 NUMBER 17
(3)  001766  000001                DZVC17: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZ11 NUMBER 17
(3)  001770  000001                DZLV17: .BLKW   1       ;PRIORITY LEVEL AND EIA FLAG SELECTOR
(3)  001772  000001                LINE17: .BLKW   1       ;ALL LINES SELECTED
(3)  001774  000001                PAR17:  .BLKW   1       ;PARAMETERS
(3)  001776  000001                MANT17: .BLKW   1       ;MAINTENANCE MODF FOR THIS DEVICE
(3)                                ; -  END O MACRO ********-*********
(1)
(1)  002000  177777                DZ.END: 177777
```

```
(1)                                     ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
(1)                                     ;POINTERS TO SUBROUTINES CAN BE FOUND
(1)                                     ;IN THE TABLE IMMEDIATELY FOLLOWING THE DEFINITIONS
(1)
(1)                                     ;:*****************************************************************************
(1)                                     ;--------- ------------------------------------------- ------ -- --
(1)  002002                             .TRPTAB:
(3)          104400                     ADVANCE=TRAP+0          ;CALL TO ADVANCE TO NEXT TEST( OR SCOPE THIS ONE)
(2)  002002  007206                             .ADVANCE
(2)                                     ; -- END 0 MACRO ******************
(3)          104401                     SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
(2)  002004  005376                             .SCOP1
(2)                                     ; -- END 0 MACRO ******************
(3)          104402                     TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
(2)  002006  005422                             .TYPE
(2)                                     ; -- END 0 MACRO ******************
(3)          104403                     INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
(2)  002010  006242                             .INSTR
(2)                                     ; -- END 0 MACRO ******************
(3)          104404                     INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
(2)  002012  006416                             .INSTER
(2)                                     ; -- END 0 MACRO ******************
(3)          104405                     PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
(2)  0C2014  006436                             .PARAM
(2)                                     ; -- END 0 MACRO ******************
(3)          104406                     SETFLG=TRAP+6           ;CALL TO  SET FLAG ROUTINE
(2)  002016  011142                             .SETFLG
(2)                                     ; -- END 0 MACRO ******************
(3)          104407                     SAV05=TRAP+7            ;CALL TO REGISTER SAVE ROUTINE
(2)  002020  006636                             .SAV05
(2)                                     ; -- END 0 MACRO ******************
(3)          104410                     RES05=TRAP+10           ;CALL TO REGISTER RESTORE ROUTINE
(2)  002022  006676                             .RES05
(2)                                     ; -- END 0 MACRO ******************
(3)          104411                     CONVRT=TRAP+11          ;CALL TO DATA OUTPUT ROUTINE
(2)  002024  006730                             .CONVRT
(2)                                     ; -- END 0 MACRO ******************
(3)          104412                     CNVRT=TRAP+12           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
(2)  002026  006734                             .CNVRT
(2)                                     ; -- END 0 MACRO ******************
(3)          104413                     DEVICE.CLR=TRAP+13              ;CALL TO ISSUE A DEVICE CLEAR
(2)  002030  007134                             .DEVICE.CLR
(2)                                     ; -- END 0 MACRO ******************
(3)          104414                     DELAY=TRAP+14           ;CALL TO DELAY FOR FAST CPU'S
(2)  002032  007166                             .DELAY
(2)                                     ; -- END 0 MACRO ******************
(3)          104415                     PARMD=TRAP+15           ;CONVERT DECIMAL STRING TO OCTAL
(2)  002034  026772                             .PARMD
(2)                                     ; -- END 0 MACRO ******************
(3)          104416                     PAWCH=TRAP+16           ;SET FLAG    ECHO OR  CABLE
(2)  002036  027166                             .PAWCH
(2)                                     ; -- END 0 MACRO ******************
(3)          104417                     DCLASM=TRAP+17          ;CLEAR DEVICE, SET MAINT. BIT IF I MODE
(2)  002040  007154                             .DCLASM
(2)                                     ; -- END 0 MACRO ******************
(1)
```

```
(1)                                     ;-------------------------------------------------------------------------
(1)                                     ;;*************************************************************************
```

```
(1)                                     ;DZ11 VECTOR AND REGISTER INDIRECT POINTERS
(1)                                     ;WORKING AREA
(1)
(1)  002042  160040            DZCSR:   160040  ;R/W
(1)  002044  160041            HDZCSR:  160041  ;R/W
(1)  002046  160042            DZRBUF:  160042  ;READ ONLY
(1)  002050  160043            HDZRBUF:         160043  ;READ ONLY
(1)  002052  160042            DZLPR:   160042  ;WRITE ONLY
(1)  002054  160043            HDZLPR:  160043  ;WRITE ONLY
(1)  002056  160044            DZTCR:   160044  ;R/W
(1)  002060  160045            HDZTCR:  160045  ;R/W
(1)  002062  160046            DZMSR:   160046  ;READ ONLY
(1)  002064  160047            HDZMSR:  160047  ;READ ONLY
(1)  002066  160046            DZTDR:   160046  ;WRITE ONLY
(1)  002070  160047            HDZTDR:  160047  ;WRITE ONLY
(1)                                     ;DEFAULT DZ VECTORS
(1)  002072  000300            DZRIV:   300     ;REC INTR VECTOR
(1)  002074  000302            DZRIS:   302     ;REC INTR STATUS
(1)  002076  000304            DZTIV:   304     ;XMIT INTR VECTOR
(1)  002100  000306            DZTIS:   306     ;XMIT INTR STATUS
(1)
(1)
```

```
(1)
(1)                                     ;TIME TABLE FOR RELATIVE TIMING TESTS
(1)                                     ;-----------------------------------
(1)
(1)  002102                             TMTBL:
(1)  002102  000000                     T50:    0
(1)  002104  000000                     T75:    0
(1)  002106  000000                     T110:   0
(1)  002110  000000                     T134:   0
(1)  002112  000000                     T150:   0
(1)  002114  000000                     T300:   0
(1)  002116  000000                     T600:   0
(1)  002120  000000                     T1200:  0
(1)  002122  000000                     T1800:  0
(1)  002124  000000                     T2000:  0
(1)  002126  000000                     T2400:  0
(1)  002130  000000                     T3600:  0
(1)  002132  000000                     T4800:  0
(1)  002134  000000                     T7200:  0
(1)  002136  000000                     T9600:  0
(1)  002140  000000                     TEIGHT:0
(1)  002142  000000                     TSEVEN: 0
(1)  002144  000000                     TSIX:   0
(1)  002146  000000                     TFIVE:  0
```

```
(1)
(1)                                     ;PROGRAM INITIALIZATION
(1)                                     ;LOCK OUT INTERRUPTS
(1)                                     ;SET UP PROCESSOR STACK
(1)                                     ;SET UP POWER FAIL VECTOR
(1)                                     ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
(1)                                     ;TYPE TITLE MESSAGE
(1)
(1)  002150                         .START:
(1)  002150  000005                     RESET                   ;CLEAR THE WORLD. START NEW ENVIRONMENT
(1)  002152  012706  001120              MOV     #STACK,SP       ;SET UP STACK
(1)  002156  106427  000340              MTPS    #PR7            ;LOCK OUT INTERRUPTS
(1)  002162  012737  010310  000024      MOV     #$PWRDN,@#24    ;SET UP POWER FAIL VECTOR
(1)  002170  012737  005122  000020      MOV     #$SCOPE,@#IOTVEC        ;SET VECTOR FOR SCOPE ROUTINE
(1)  002176  012737  000340  000022      MOV     #340,@#IOTVEC+2         ;LEVEL 7
(1)  002204  012737  007220  000030      MOV     #$ERROR,@#EMTVEC        ;SET VECTOR FOR ERROR ROUTINE
(1)  002212  012737  000340  000032      MOV     #340,@#EMTVEC+2         ;LEVEL 7
(1)  002220  012737  007112  000034      MOV     #.TRPSR,@#TRAPVEC       ;SET VECTOR FOR TRAP CALLS
(1)  002226  012737  000340  000036      MOV     #340,@#TRAPVEC+2        ;LEVEL 7
(1)  002234  012737  010310  000024      MOV     #$PWRDN,@#PWRVEC        ;SET VECTOR FOR POWER FAIL ROUTINE
(1)  002242  012737  000340  000026      MOV     #340,@#PWRVEC+2         ;LEVEL 7
(1)  002250  113737  001410  001411      MOVB    DZNUM,SAVNUM    ;SAVE NUMBER OF DEVICES IN SYSTEM.
(1)  002256  005037  001242              CLR     $PASS           ;CLEAR PASS COUNT
(1)  002262  105037  001123              CLRB    $ERFLG          ;CLEAR ERROR FLAG
(1)  002266  012737  001500  001412      MOV     #DZ.MAP,ACTIVE  ;GET MAP POINTER.
(1)  002274  012737  000001  001406      MOV     #1,RUN          ;POINT POINTER TO FIRST DEVICE.
(1)  002302  005037  001132              CLR     $ERTTL          ;CLEAR ERROR COUNT
(1)  002306  005037  001136              CLR     $ERRPC          ;CLEAR LAST ERROR POINTER
(1)  002312  005037  001122              CLR     $TSTNM          ;SET UP FOR TEST 1
(1)  002316  012737  002150  001126      MOV     #.START,$LPADR  ;SET UP FOR POWER FAIL BEFORE
(1)                                                             ;TESTING STARTS
(1)                                     ;SET UP FOR SMALL 11 SWITCH REGISTER COMPATIBILITY
(1)  002324  013746  000006              MOV     6 -(SP)         ;SAVE BUS ERROR PS
(1)  002330  013746  000004              MOV     4,-(SP)         ;SAVE BUS ERROR PC
(1)  002334  012737  002354  000004      MOV     #20$,4          ;SET UP TO TRAP TO THIS ROUTINE
(1)  002342  022777  177777  176610      CMP     #-1,@SWR        ;CAN 177570 BE REFERENCED?
(1)  002350  001402                      BEQ     22$             ;IF SO AND IT IS -1, TREAT LIKE SWITCHLESS
(1)  002352  000407                      BR      21$             ;IF YES,SKIP AROUND THE SETUP
(1)  002354  022626                  20$:MOV     POP2SP          ;REMOVE THE TRAP FROM THE STACK
(1)  002356  012737  000176  001160  22$: MOV     #SWREG,SWR      ;IF NO,TRAP COMES HERE.POINT TO SOFTWARE SWR
(1)  002364  012737  000174  001162      MOV     #DISPREG,DISPLAY ;POINT TO SOFTWARE DISPLAY REGISTER
(1)  002372  012637  000004          21$:MOV     (SP)+,4         ;RESTORE THE BUS ERROR VECTOR
(1)  002376  012637  000006              MOV     (SP)+,6
(1)  002402  105737  001415              TSTB    INIFLG          ;TITLE ALREADY PRINTED?
(1)  002406  001010                      BNE     29$             ;BRANCH IF YES
(1)  002410  023727  000042  005056      CMP     @#42,#$ENDAD    ;RUNNING UNDER ACT?
(1)  002416  001402                      BEQ     31$             ;IF YES DONT PRINT TITLE
(1)  002420  104402  001000              TYPE    ,MTITLE         ;PRINT THE DIAGNOSTIC'S TITLE
(1)  002424  105337  001415          31$:DECB    INIFLG          ;SET THE ONCE ONLY FLAG
(1)  002430  105737  001255          29$:TSTB    $ENVM           ;DETERMINE WHETHER APT SIZING SHOULD BE DONE
(1)  002434  100006                      BPL     30$             ;IF NOT, GO CHECK FOR AUTO SIZING
(1)  002436  004737  012102              JSR     PC,SETAPT       ;OTHERWISE, GO DO APT SIZING FROM ETABLE
(1)                                 ;REPLACE "CLRB HDRFLG" WITH NOP'S
(1)  002442  000240                      NOP
(1)  002444  000240                      NOP
(1)                                 ;       CLRB    HDRFLG          ;MAKE SURE STATUS TABLE IS PRINTED
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(1)  002446  000137  004420                    JMP     16$             ;GO PRINT DZ STATUS TABLE
(1)  002452  032777  000001  176500  30$:      BIT     #SW00,@SWR      ;RESELECT ?
(1)  002460  001011                            BNE     32$             ;IF YES, GO SET UP THE INFORMATION
(1)  002462  122737  000377  001415            CMPB    #377,INIFLG     ;ON 1ST START; MUST ANSWER QUESTION
(1)  002470  001003                            BNE     .+10            ;IF NOT ANSWERING QUESTIONS
(1)  002472  105777  176462                    TSTB    @SWR            ;ARE U AUTO SIZING?
(1)  002476  100402                            BMI     32$             ;NO AUTO SIZE! NO SW00=1 ON 1ST START!
(1)  002500  000137  003244                    JMP     73$             ;IF NO, SKIP THE INTERROGATION
(1)  002504  012700  001500            32$:    MOV     #DZ.MAP,R0      ;POINT TO THE BEGINNING OF THE MAP TABLE
(1)  002510  105037  001416                    CLRB    HDRFLG          ;MAKE SURE A MAP GETS PRINTED
(1)  002514  005020                    65$:    CLR     (R0)+           ;CLEAR A TABLE LOCATION
(1)  002516  020027  002000                    CMP     R0,#DZ.END      ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
(1)  002522  001374                            BNE     65$             ;IF NOT ,CLEAR THE NEXT LOCATION IN THE TABLE
(1)  002524  105337  001415                    DECB    INIFLG          ;INSURE NO AUTO SIZING IF QUESTIONS ANSWERED!
(1)
(1)                                    ;THE FOLLOWING ARE PARAMETERS USED TO FILL IN THE MAP
(1)                                    ;TABLE AND SET UP THE DIAGNOSTIC.
(1)
(1)                                            ;GET THE BASE ADDRESS OF THE DZ11'S
(1)
(1)  002530                            33$:
(2)                                                    ; -$GETPAR----------------------------------
(2)  002530  104403                            INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002532  003464                            66$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002534  104405                            PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002536  160000                            160000                  ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002540  163770                            163770                  ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002542  001500                            DZCR0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002544     007                            .BYTE   7               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002545     001                            .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)                                    ; -- END 0 MACRO ------------------
(1)  002546  013737  001500  001310            MOV     DZCR0,$BASE     ;COPY BASE ADDRESS TO ETABLE
(1)
(1)                                            ;GET THE BASE VECTOR ADDRESS
(1)
(1)  002554                            34$:
(2)                                                    ; -$GETPAR----------------------------------
(2)  002554  104403                            INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002556  003530                            67$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002560  104405                            PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002562  000300                            300                     ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002564  000776                            776                     ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002566  001502                            DZVC0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002570     003                            .BYTE   3               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002571     001                            .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)                                    ; -- END 0 MACRO ------------------
(1)  002572  013737  001502  001304            MOV     DZVC0,$VECT1    ;COPY VECTOR TO ETABLE
(1)
(1)                                            ;GET THE BUS REQUEST LEVEL
(1)
(2)                                                    ; -$GETPAR----------------------------------
(2)  002600  104403                            INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002602  003571                            68$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002604  104405                            PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002606  000004                            4                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002610  000007                            7                       ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
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(2)  002612  001504                          DZLVO                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002614     000                          .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002615     001                          .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)                                  ; -- END 0 MACRO ******************
(1)  002616  113737  001504  001305          MOVB    DZLVO,$VECT1+1  ;GET BUS REQUEST LEVEL INTO ETABLE
(1)  002624  106337  001305                  ASLB    $VECT1+1        ;ALIGN THE BITS PROPERLY
(1)  002630  106337  001305                  ASLB    $VECT1+1        ;ALIGN THE BITS PROPERLY
(1)  002634  106337  001305                  ASLB    $VECT1+1        ;ALIGN THE BITS PROPERLY
(1)  002640  106337  001305                  ASLB    $VECT1+1        ;ALIGN THE BITS PROPERLY
(1)  002644  106337  001305                  ASLB    $VECT1+1        ;ALIGN THE BITS PROPERLY
(1)
(1)                                          ;FIND OUT IF MODULE IS EIA OR 20 MA.
(1)
(1)  002650  104402  004260                  TYPE    .74$            ;PRINT EIA MESSAGE
(1)  002654  005037  001220                  CLR     $TMP1           ;USE $TMP1
(1)  002660  105777  176300          80$:    TSTB    @$TKS           ;IS KEYBOARD DONE?
(1)  002664  100375                  BPL     80$                     ;IF NOT, WAIT FOR IT
(1)  002666  017746  176274                  MOV     @$1KB,-(SP)     ;IF YES, PUT CHARACETR ON STACK
(1)  002672  042716  177600                  BIC     #177600,(SP)    ;STRIP DOWN CHARACTER           ;;DSH-BHL
(1)  002676  122716  000023                  CMPB    #$XOFF,(SP)     ;IS IT A XOFF?                  ;;DSH-BHL
(1)  002702  001014                          BNE     83$             ;BR IF NOT                      ;;DSH
(1)  002704  105777  176254          101$:   TSTB    @$TKS           ;WAIT FOR A CHARACTER           ;;DSH-BHL
(1)  002710  100375                  BPL     101$                    ;                               ;;DSH-BHL
(1)  002712  117716  176250                  MOVB    @$TKB,(SP)      ;GET CHARACTER                  ;;DSH-BHL
(1)  002716  042716  177600                  BIC     #177600,(SP)    ;STRIP DOWN CHARACTER           ;;DSH-BHL
(1)  002722  122716  000021                  CMPB    #$XON,(SP)      ;WAIT FOR A XON?                ;;DSH-BHL
(1)  002726  001366                          BNE     101$            ;GET NEXT CHAR IF NOT           ;;DSH-BHL
(1)  002730  005726                          TST     (SP)+           ;POP STACK                      ;;DSH
(1)  002732  000752                          BR      80$             ;WAIT FOR A CHAR                ;;DSH
(1)  002734  122716  000021          83$:    CMPB    #$XON,(SP)      ;IS IT A RANDOM XON             ;;DSH-BHL
(1)  002740  001002                          BNE     102$            ;BR IF NO                       ;;DSH-BHL
(1)  002742  005726                          TST     (SP)+           ;ELSE, POP STACK                ;;DSH-BHL
(1)  002744  000745                          BR      80$             ;GO GET NEXT CHAR               ;;DSH-BHL
(1)  002746  122726  000015          102$:   CMPB    #15,(SP)+       ;IS IT <CR> ?
(1)  002752  001414                          BEQ     81$             ;IF SO, GET OUT
(1)  002754  014677  176212                  MOV     -(SP),@$TPB     ;IF NOT, PRINT CHARACTER
(1)  002760  042737  100000  001504          BIC     #BIT15,DZLVO    ;CLEAR EIA FLAG
(1)  002766  122726  000102                  CMPB    #102,(SP)+      ;IS IT A B?
(1)  002772  001332                          BNE     80$             ;IF NOT, GO BACK FOR INPUT
(1)  002774  052737  100000  001504          BIS     #BIT15,DZLVO    ;IF SO, SET FLAG
(1)  003002  000726                          BR      80$             ;GET MORE INPUT
(1)  003004                          81$:
(1)
(1)                                          ;GET THE MODE OF OPERATION (E,I,S)
(1)
(2)                                                  ; -$GETFLG-----------------------------
(2)  003004  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  003006  004002                          72$                     ;POINTER TO THE MESSAGE TO BE PRINTED
(2)  003010  104406                          SETFLG                  ;CALL THE MAINTENANCE FLAG SETUP ROUTINE
(2)  003012  001512                          MANTO                   ;THIS IS THE FLAG BEING SETUP
(2)                                  ; -- END 0 MACRO ******************
(1)
(1)                                          ;GET THE NUMBER OF DZ11'S RUNNING
(1)
(2)                                                  ; -$GETPAR ---------------------------------
(2)  003014  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
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(2)  003016  003740                          71$                    ;POINTER TO MESSAGE TO BE PRINTED
(2)  003020  104405                          PARAM                  ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  003022  000001                          1                      ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003024  000020                          16.                    ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003026  001220                          $TMP1                  ;POINTER TO MAP LOCATION TO BE FILLED
(2)  003030     000                          .BYTE   0              ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  003031     001                          .BYTE   1              ;NUMBER OF PARAMETERS TO STORE
(2)                                  ;  - END 0 MACRO ****************
(1)
(1)  003032  012737  000377  001506          MOV     @377,LINE0     ;SET UP DEFAULT LINES
(1)  003040  012737  017070  001510          MOV     @17070,PAR0    ;SET UP DEFAULT LPR PARAMETER
(1)                                                                 ;RECEIVER ON; 9600 BAUD; 2STOP BITS; 8 BIT/CHAR
(1)  003046  012737  000001  007204          MOV     @1,DLYCNT      ;INITIALIZE DELAY COUNT
(1)  003054  032777  000010  176076          BIT     @SW03,@SWR     ;DO YOU WANT PARAMETERS?
(1)  003062  001402                          BEQ     40$            ;IF NO, SKIP THE PARAMETER CALL
(1)  003064  004737  003274                  JSR     PC,23$         ;GET PARAMETERS
(1)  003070  012737  000001  001312  40$:    MOV     @1,$DEVM       ;INITIALIZE ACTIVE DEVICE SELECTION PARAMETER
(1)  003076  113737  001220  001410          MOVB    $TMP1,DZNUM    ;COPY THE NUMBER OF DEVICES
(1)  003104  113737  001220  001411          MOVB    $TMP1,SAVNUM   ;COPY A BACKUP NUMBER
(1)  003112  005337  001220          62$:    DEC     $TMP1          ;$TMP1 CONTAINS THE COUNT OF UNINITIALIZED
(1)  003116  001404                          BEQ     61$            ; SELECTED DEVICES
(1)  003120  000261                          SEC                    ;SET A BIT FLAG TO INDICATE AN ACTIVE DEVICE
(1)  003122  006137  001312                  ROL     $DEVM          ;POINT TO THE NEXT DEVICE
(1)  003126  000771                          BR      62$            ;GO DO THIS PROCEDURE AGAIN
(1)  003130  013737  001312  001222  61$:    MOV     $DEVM,$TMP2    ;@ OF TIMES
(1)  003136  013737  001312  001404          MOV     $DEVM,DZACTV   ;COPY THE ACTIVE DEVICE PARAMETER
(1)  003144  012700  001500                  MOV     @DZCR0,R0      ;SET A POINTER TO THE SPECIFIED INFORMATION
(1)  003150  012701  001514                  MOV     @DZCR1,R1      ;POINT R1 TO THE REST OF THE MAP TABLE
(1)  003154  012702  001320                  MOV     @$DDW0,R2      ;POINT TO ETABLE'S DEVICE DESCRIPTOR WORDS
(1)  003160  000241                          CLC                    ;INITIALIZE THE "C" BIT FOR A ROTATION
(1)  003162  006037  001222                  ROR     $TMP2          ;SKIP MAPPING SETUP FOR DEVICE 0- IT'S DONE
(1)  003166  006237  001222          64$:    ASR     $TMP2          ;ISOLATE A SELECTION FLAG IN THE "C" BIT
(1)  003172  103404                          BCS     41$            ;IS THIS DEVICE SELECTED? IF YES, GO LOAD TABLE
(1)  003174  012711  177777                  MOV     @-1,(R1)       ;TERMINATE THE LIST
(1)  003200  000137  004374                  JMP     63$            ;GO TO THE NEXT BLOCK
(1)  003204  012011                  41$:    MOV     (R0)+,(R1)     ;ADDRESS
(1)  003206  062721  000010                  ADD     @10,(R1)+      ;POINT TO THE NEXT DZ11 ADDRESS VALUE
(1)  003212  012011                          MOV     (R0)+,(R1)     ;VECTOR
(1)  003214  062721  000010                  ADD     @10,(R1)+      ;POINT TO THE NEXT VECTOR VALUE
(1)  003220  012021                          MOV     (R0)+,(R1)+    ;LEVEL
(1)  003222  012021                          MOV     (R0)+,(R1)+    ;LINES
(1)  003224  016012  177774                  MOV     -4(R0),(R2)    ;GET THE EIA FLAG FROM THE PRIORITY WORD
(1)  003230  042712  077777                  BIC     @77777,(R2)    ;ISOLATE THAT FLAG
(1)  003234  051022                          BIS     (R0),(R2)+     ;ADD PARAMETERS TO DEVICE DESCRIPTOR WORD
(1)  003236  012021                          MOV     (R0)+,(R1)+    ;PARAMETERS
(1)  003240  012021                          MOV     (R0)+,(R1)+    ;MAINTENANCE MODE
(1)  003242  000751                          BR      64$
(1)  003244  032777  000010  175706  73$:    BIT     @SW03,@SWR     ;ASK PARAMETERS ?
(1)  003252  001002                          BNE     42$            ;IF NO, GO DO AUTO SIZING
(1)  003254  000137  004374                  JMP     63$            ;GO SET UP FOR AUTO SIZING
(1)  003260  004737  003274          42$:    JSR     PC,23$         ;GO ASK PARAMETERS
(1)  003264  105337  001415                  DECB    INIFLG         ;INSURE NO AUTO SIZE IF QUESTIONS ANSWERED
(1)  003270  000137  004420                  JMP     16$            ;GO TO THE NEXT BLOCK
(1)
(1)                                          ;GET THE ACTIVE LINES PARAMETER
(1)
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(1)  003274                          23$:
(2)                                                  ; -$GETPAR----------------------------------
(2)  003274  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  003276  003614                          69$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  003300  104405                          PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  003302  000001                          1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003304  000377                          377                     ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003306  001506                          LINE0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  003310     000                          .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  003311     001                          .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)                                  ;    END 0 MACRO ------------------
(1)  003312  105037  001416                  CLRB    HDRFLG          ;MAKE SURE THE CHANGES ARE PRINTED
(1)
(1)                                  ;THIS SEGMENT CHECKS TO MAKE SURE THE LINE PARAMETER JUST ENTERED
(1)                                  ;IS LEGITIMATE IN STAGGERED MODE OPERATION IF THAT MODE WAS SELECTED
(1)
(1)  003316  005737  001512                  TST     MANTO           ;IS STAGGERED THE MODE OF OPERATION?
(1)  003322  100021                          BPL     26$             ;IF NOT, SKIP THIS SEGMENT
(1)  003324  013703  001506                  MOV     LINE0,R3        ;GET A SCRATCH COPY OF THE ACTIVE LINES
(1)  003330  006003                  24$:    ROR     R3              ;GET A LINE SELECTION BIT(EVEN NUMBER LINE)
(1)  003332  103410                          BCS     25$             ;IF IT IS SELECTED, CHECK TO SEE IF THE NEXT IS TOO
(1)  003334  001414                          BEQ     26$             ;IF ALL HAVE BEEN CHECKED, CONTINUE PROCESSING
(1)  003336  006203                          ASR     R3              ;IF IT IS 0,CHECK TO SEE IF THE NEXT IS TOO
(1)  003340  103373                          BCC     24$             ;IF THIS ONE'S 0 TOO, GO CHECK THE NEXT PAIR
(1)  003342  104402  001230          27$:    TYPE    .$QUES          ;THIS IS AN INCORRECT PARAMETER
(1)  003346  104402  011065                  TYPE    .MBADLN         ;LET THE USER KNOW ABOUT IT
(1)  003352  000750                          BR      23$             ;GO GET THE CORRECT PARAMETER
(1)  003354  001772                  25$:    BEQ     27$             ;IF ANOTHER FLAG ISN'T SET, THERE'S AN ERROR
(1)  003356  006203                          ASR     R3              ;GET THE NEXT FLAG
(1)  003360  103370                          BCC     27$             ;IF IT ISN'T SET, THERE'S AN ERROR
(1)  003362  000241                          CLC                     ;INITIALIZE THE "C" BIT FOR TESTING OF THE NEXT PAIR
(1)  003364  000761                          BR      24$             ;GO TEST THE NEXT PAIR OF FLAGS
(1)
(1)                                          ;GET THE LINE PARAMETER REGISTER ARGUMENT
(1)
(1)  003366                          26$:
(2)                                                  ;  $GETPAR----------------------------------
(2)  003366  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  003370  003670                          70$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  003372  104405                          PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  003374  000000                          0                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003376  000017                          17                      ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003400  001510                          PAR0                    ;POINTER TO MAP LOCATION TO BE FILLED
(2)  003402     000                          .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  003403     001                          .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)                                  ; -- END 0 MACRO ------------------
(1)  003404  012702  001506                  MOV     #LINE0,R2       ;POINT TO THE LINE SELECTION PARAMETER
(1)  003410  012703  001510                  MOV     #PAR0,R3        ;POINT TO THE CHOSEN PARAMETERS
(1)  003414  011304                          MOV     (R3),R4         ;USE BAUD RATE AS AN INDEX IN DELAY TABLE
(1)  003416  006304                          ASL     R4              ;ALIGN INDEX ON WORD BOUNDARY
(1)  003420  016437  032444  007204          MOV     DLYTBL(R4),DLYCNT ;SET THE DELAY COUNT FOR THIS BAUD  ATE
(1)  003426  000313                          SWAB    (R3)            ;PLACE IN HIGH BYTE
(1)  003430  052713  010070                  BIS     #10070,(R3)     ;PLACE EXTRA PARAMETERS INTO LOC
(1)  003434  011262  000014          28$:    MOV     (R2),14(R2)     ;LOAD THE LINES
(1)  003440  011363  000014                  MOV     (R3),14(R3)     ;LOAD THE PARAMETERS
(1)  003444  062702  000014                  ADD     #14,R2          ;POINT TO THE NEXT SET
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(1) 003450 062703 000014                ADD     #14,R3          ; .. OF BOTH PARA ETERS
(1) 003454 020327 001774                CMP     R3,#PAR17       ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
(1) 003460 001365                       BNE     28$             ;IF NOT, GO LOAD SOME MORE PARAMETERS
(1) 003462 000207                       RTS     PC              ;RETURN TO CALLING BLOCK
(1) 003464 030600 052123 041440 66$:    .ASCIZ  <200>/1ST CSR ADDRESS (160000:163700):  /
(1) 003530 030600 052123 053040 67$:    .ASCIZ  <200>/1ST VECTOR ADDRESS (300:770):  /
(1) 003571    200 051102 046040 68$:    .ASCIZ  <200>/BR LEVEL (4:6):  /
(1) 003614 046200 047111 051505 69$:    .ASCIZ  <200>/LINES ACTIVE BY BIT <IN OCTAL>(001:377):  /
(1) 003670 042200 043105 052501 70$:    .ASCIZ  <200>/DEFAULT BAUD RATE <IN OCTAL>(00:16):  /
(1) 003740 021600 047440 020106 71$:    .ASCIZ  <200>/# OF DZ11'S <IN OCTAL> (1:20):  /
(1) 004002 046600 044501 052116 72$:    .ASCII  <200>/MAINTENANCE MODE/
(1) 004023    200 055440 054105         .ASCII  <200>/ [EXTERNAL  <H325>-EIA ONLY      (E)]/
(1) 004071    200 055440 047111         .ASCII  <200>/ [INTERNAL  <DZCSR03=1>          (I)]/
(1) 004137    200 055440 052123         .ASCII  <200>/ [STAGGERED <H3271> EIA ONLY     (S)]: /
(1) 004207    200 055440 052123         .ASCIZ  <200>/ [STAGGERED <H3190>-20MA ONLY    (S)]: /
(1) 004260 052200 050131 020105 74$:    .ASCIZ  <200>/TYPE "A" FOR EIA MODULE OR "B" FOR 20 MA (A:B): /
(1) 004342 042600 052116 051105 75$:    .ASCIZ  <200>/ENTER DELAY PARAMETER: /
(1)        004374                       .EVEN
(1) 004374                              63$:
(1) 004374 122737 000377 001415         CMPB    #377,INIFLG     ;ONLY DO AUTO SIZE ON 1ST START
(1) 004402 001006                       BNE     16$             ;
(1) 004404 032777 000200 174546         BIT     #BIT7,@SWR      ;BIT7=1??
(1) 004412 001002                       BNE     16$             ;BR IF NO AUTO SIZE
(1) 004414 004737 012254                JSR     PC,AUTO.SIZE    ;GO DO THE AUTO SIZE
(1) 004420 105737 001416         16$:   TSTB    HDRFLG          ;HAS THE TABLE BEEN TYPED YET?
(1) 004424 001021                       BNE     1$              ;IF SO, DON'T TYPE IT AGAIN
(1) 004426 105337 001416                DECB    HDRFLG          ;INDICATE THAT THE TABLE WILL BE TYPED
(1) 004432 104402 011040                TYPE    ,XHEAD          ;TYPE MAP HEADER
(1) 004436 012700 001500                MOV     #DZ.MAP,R0      ;SET POINTER
(1) 004442 010037 001220         5$:    MOV     R0,$TMP1        ;POINT TO THE MAP LOCATION
(1) 004446 012037 001222                MOV     (R0)+,$TMP2     ;SET DATA
(1) 004452 022737 177777 001222         CMP     #-1,$TMP2       ;END OF LIST?
(1) 004460 001403                       BEQ     1$              ;BR IF YES
(1) 004462 104411                17$:   CONVRT                  ;CALL THE OCTAL TO ASCII CONVERSION ROUTINE
(1) 004464 011130                       XSTATQ                  ;CONVERT THE DATA AT THIS ADDRESS
(1) 004466 000765                       BR      5$              ;GO PRINT THE NEXT PARAMETER
(1) 004470 005737 000042         1$:   TST     @#42            ;IS PROGRAM RUNNING UNDER MONITOR
(1) 004474 001026                       BNE     3$              ;YES
(1) 004476 032777 000100 174454         BIT     #SW06,@SWR      ;DESELECT SPECIFIC DEVICES??
(1) 004504 001422                       BEQ     3$              ;BR IF NO.
(1) 004506 104402 010761                TYPE    ,MNEW           ;TYPE THE MESSAGE.
(1) 004512 005000                       CLR     R0              ;ZERO DATA DISPLAY
(1) 004514 000000                       HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
(1) 004516 027737 174436 001312         CMP     @SWR,$DEVM      ;IS THE NUMBER VALID?
(1) 004524 101404                       BLOS    2$              ;BR IF NUMBER IS OK.
(1) 004526 104402 010633                TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
(1) 004532 000000                9$:    HALT                    ;STOP EVERY THING.
(1) 004534 000776                       BR      9$              ;RESTART THE PROGRAM AGAIN.
(1) 004536 017737 174416 001404  2$:    MOV     @SWR,DZACTV     ;GET NEW DEVICE PATTERN
(1) 004544 013700 001404                MOV     DZACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
(1) 004550 000000                       HALT                    ;CONTINUE DYNAMIC SWITCHES.
(1) 004552 032777 000020 174400  3$:    BIT     #SW04,@SWR      ;CHECK TO SEE IF DELAY COUNT CHANGES
(1) 004560 001407                       BEQ     18$             ;IF NOT, GO CLEAR VECTOR AREA
(2)                                                             ; -$GETPAR--=============================-
(2) 004562 104403                       INSTR                   ;CALL THE STRING INPUT ROUTINE
(2) 004564 004342                       75$                     ;POINTER TO MESSAGE TO BE PRINTED
```

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   (2)  004566  104405                        PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
   (2)  004570  000001                        1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
   (2)  004572  177777                        177777                  ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
   (2)  004574  007204                        DLYCNT                  ;POINTER TO MAP LOCATION TO BE FILLED
   (2)  004576     000                        .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
   (2)  004577     001                        .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
   (2)                                ;  - END 0 MACRO ******************
   (1)  004600  012700  000300       18$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
   (1)  004604  012701  000302                MOV     #302,R1         ;VECTOR AREA. 300-776
   (1)  004610  010120               4$:      MOV     R1,(R0)+        ;START PUTTING "PC+2 - HALT"
   (1)  004612  005021                        CLR     (R1)+           ;IN VECTOR AREA.
   (1)  004614  022021                        CMP     (R0)+,(R1)+     ;POP POINTERS
   (1)  004616  022700  001000                CMP     #1000,R0        ;ALL DONE??
   (1)  004622  001372                        BNE     4$              ;BR IF NO.
   (1)
   (1)                                ;TEST START AND RESTART
   (1)                                ;--------- -----------
   (1)
   (1)  004624  012706  001120       .BEGIN:  MOV     #STACK,SP       ;SET UP STACK
   (1)  004630  106427  000340                MTPS    #PR7            ;LOCK OUT INTERRUPTS
   (1)  004634  005737  000042                TST     @#42            ;IS PROGRAM UNDER MONITOR CONTROL
   (1)  004640  001015                        BNE     2$              ;BR IF YES
   (1)  004642  032777  000004  174310        BIT     #BIT2,@SWR      ;CHECK FOR LOCK ON TEST
   (1)  004650  001406                        BEQ     1$              ;BR IF NO LOCK DESIRED.
   (1)  004652  104402  010657                TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
   (1)  004656  012737  000240  005140        MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
   (1)  004664  000403                        BR      2$              ;CONTINUE ALONG.
   (1)  004666  013737  005372  005140  1$:   MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
   (1)  004674  012737  011532  001126  2$:   MOV     #CYCLE,$LPADR   ;START AT 'CYCLE" FIND WHICH DEVICE TO TEST
   (1)  004702  104402  010550                TYPE    ,MR             ;TYPE "RUNNING"
   (1)  004706  000177  174214                JMP     @$LPADR         ;START TESTING
   (1)                                ; -  END 0 MACRO =========-= -=-=-=-=
  3644                                                                ;  PRGEND =-=========-=-=-==========-==
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```
(2)                                     ;END OF PASS
(2)                                     ;TYPE NAME OF TEST
(2)                                     ;UPDATE PASS COUNT
(2)                                     ;CHECK FOR EXIT TO ACT-11
(2)                                     ;RESTART TEST
(3)                                 .SBTTL  END OF PASS ROUTINE
(3)
(4)                                 ;;**********************************************************************
(3)                                 ;*INCREMENT THE PASS NUMBER ($PASS)
(3)                                 ;*IF THERES A MONITOR GO TO IT
(3)                                 ;*IF THERE ISN'T JUMP TO CYCLE
(3)
(3)  004712                         $EOP:
(5)                                                             ; -PASEND-**********************************
(5)  004712  000004                         SCOPE
(5)  004714  005037  001136                 CLR     $ERRPC          ;CLEAR LAST ERROR PC
(5)  004720  105037  001123                 CLRB    $ERFLG          ;CLEAR ERROR FLAG
(5)  004724  104402  010525                 TYPE    ,MEPASS         ;TYPE END PASS
(5)  004730  104402  010706                 TYPE    ,MCSRX          ;TYPE CSR
(5)  004734  104412  005072                 CNVRT   ,XCSR           ;SHOW IT
(5)  004740  104402  010714                 TYPE    ,MVECX          ;TYPE VECTOR
(5)  004744  104412  005100                 CNVRT   ,XVEC           ;SHOW IT
(5)  004750  005237  001242                 INC     $PASS           ;RAISE PASS COUNT
(5)  004754  104402  010722                 TYPE    ,MPASSX         ;TYPE PASSES
(5)  004760  104412  005106                 CNVRT   ,XPASS          ;SHOW IT
(5)  004764  005337  001242                 DEC     $PASS           ;RESTORE PASS COUNT
(5)  004770  104402  010733                 TYPE    ,MERRX          ;TYPE ERRORS
(5)  004774  104412  005114                 CNVRT   ,XERR           ;SHOW IT
(5)  005000  105337  001411                 DECB    SAVNUM          ;ARE ALL DEVICES TESTED?
(5)  005004  001030                         BNE     $DOAGN          ;BR IF NO.
(5)  005006  113737  001410  001411         MOVB    DZNUM,SAVNUM    ;RESTORE THE COUNT
(3)  005014  005037  001226                 CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
(3)  005020  005237  001242                 INC     $PASS           ;;INCREMENT THE PASS NUMBER
(3)  005024  042737  100000  001242         BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
(3)  005032  005327                         DEC     (PC)+           ;;LOOP?
(3)  005034  000001                 $EOPCT: .WORD   1
(3)  005036  003013                         BGT     $DOAGN          ;;YES
(3)  005040  012737                         MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
(3)  005042  000001                 $ENDCT: .WORD   1
(3)  005044  005034                         $EOPCT
(3)  005046  013700  000042         $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
(3)  005052  001405                         BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
(3)  005054  000005                         RESET                   ;;CLEAR THE WORLD
(3)  005056  004710                 $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
(3)  005060  000240                         NOP                     ;;SAVE ROOM
(3)  005062  000240                         NOP                     ;;FOR
(3)  005064  000240                         NOP                     ;;ACT11
(3)  005066                         $DOAGN:
(3)  005066  000137                         JMP     @(PC)+          ;;RETURN
(3)  005070  011532                 $RTNAD: .WORD   CYCLE
(2)
(2)  005072  000001                 XCSR:   1
(2)  005074     006     002                 .BYTE   6,2
(2)  005076  002042                         DZCSR
(2)  005100  000001                 XVEC:   1
(2)  005102     003     002                 .BYTE   3,2
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(2)  005104  002072                          DZRIV
(2)  005106  000001                  XPASS:  1
(2)  005110     006     002                  .BYTE   6,2
(2)  005112  001242                          $PASS
(2)  005114  000001                  XERR:   1
(2)  005116     006     002                  .BYTE   6,2
(2)  005120  001132                          $ERTTL
(2)
(2)                                          ;SCOPE LOOP AND ITERATION HANDLER
(2)                                          ;--------- ----------------------
(2)
(3)                                  .SBTTL  SCOPE HANDLER ROUTINE
(3)
(4)                                  ;;**********************************************************************
(3)                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
(3)                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
(3)                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
(3)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
(3)                                  ;*SW14=1        LOOP ON TEST
(3)                                  ;*SW11=1        INHIBIT ITERATIONS
(3)                                  ;*CALL
(3)                                  ;*      SCOPE           ;;SCOPE=IOT
(3)
(3)  0C5122                          $SCOPE:
(5)                                                                  ; -SC-**********************************
(5)  005122  004737  007642          .SCOPC: JSR     PC,SERV.G       ;FIND OUT IF <^G> WAS HIT
(5)  005126  005037  001136                  CLR     $ERRPC          ;CLEAR LAST ERROR PC.
(5)  005132  022716  013040                  CMP     @TST1+2,(SP)    ;IS THIS THE SCOPE AT THE BEGINNING OF TST1?
(5)  005136  001417                          BEQ     $XTSTR          ;IF SO, DON'T LOOP ON IT
(5)  005140  000412                  TTST:   BR      1$              ;GOTO 1$    (IF LOCK SW02=1; THIS LOC =240)
(5)  005142  105777  174016                  TSTB    @$TKS           ;KEYBOARD DONE?
(5)  005146  100073                          BPL     $OVER           ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
(5)  005150  127727  174012  000021          CMPB    @$TKB,#$XON     ;IS CHAR A RANDOM XON ?         ;;DSH
(5)  005156  001467                          BEQ     $OVER           ;BR IF YES                      ;;DSH
(5)  005160  017766  174002  177776          MOV     @$TKB,-2(SP)
(5)                                  ; -- END O MACRO ****************
(3)  005166  032777  040000  173764  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
(3)  005174  001060                          BNE     $OVER           ;;YES IF SW14=1
(3)                                  ;#####START OF CODE FOR THE XOR TESTER#####
(3)  005176  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
(3)                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
(3)  005200  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
(3)  005204  012737  005224  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
(3)  005212  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
(3)  005216  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(3)  005222  000436                          BR      $SVLAD          ;;GO TO THE NEXT TEST
(3)  005224  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
(3)  005226  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(3)  005232  000441                          BR      $OVER           ;;LOOP ON THE PRESENT TEST
(3)  005234                          6$:;#####END OF CODE FOR THE XOR TESTER#####
(3)  005234  105737  001123          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
(3)  005240  001404                          BEQ     3$              ;;BR IF NO
(3)  005242  105037  001123          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
(3)  005246  005037  001226                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(3)  005252  032777  004000  173700  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
(3)  005260  001011                          BNE     1$              ;;BR IF YES
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(3)  005262  005737  001242                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
(3)  005266  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
(3)  005270  005237  001124                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
(3)  005274  023737  001226  001124          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
(3)  005302  002015                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
(3)  005304  012737  000001  001124  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
(3)  005312  013737  005374  001226          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
(3)  005320  105237  001122          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
(3)  005324  113737  001122  001240          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
(3)  005332  011637  001126                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
(3)  005336  013777  001122  173616  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
(3)  005344  013716  001126                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
(5)                                                                  ; -SC1-**********************************
(5)  005350  105037  001417          3$:     CLRB    MNTFLG          ;CLEAR THE MAINTENANCE BIT SETTER AFTER EACH TEST
(5)  005354  005737  001370                  TST     MODE            ;HAS THE MODE BEEN CHANGED?
(5)  005360  001003                          BNE     4$              ;IF NOT INTERNAL , GO DO A TEST
(5)  005362  112737  000010  001417          MOVB    #MAINT,MNTFLG   ;IF INTERNAL MODE NOW, SET THE MAINTENANCE BIT
(5)  005370  000002                  4$:     RTI                     ;GO DO THE TEST
(5)  005372  000406                  BRW:    406
(5)                                  ;  - END O MACRO ****************
(3)  005374  000005                  $MXCNT: 5                       ;;MAX. NUMBER OF ITERATIONS
(1)
(1)                                          ;CHECK FOR FREEZE ON CURRENT DATA
(1)                                          ;---------- - --- -- -----------
(1)
(1)  005376  032777  001000  173554  .SCOP1: BIT     #SW09,@SWR      ;IS SW09=1(SET)?
(1)  005404  001405                          BEQ     1$              ;BR IF NOT SET.
(1)  005406  005737  001362                  TST     LOCK            ;IS THER A TIGHT LOOP SPECIFIED?
(1)  005412  001402                          BEQ     1$              ;IF NO, RETURN
(1)  005414  013716  001362                  MOV     LOCK,(SP)       ;IF YES, GOTO THE ADDRESS IN LOCK.
(1)  005420  000002                  1$:     RTI                     ;GO BACK.
(1)
(1)  005422  032777  010000  173530  .TYPE:  BIT     #SW12,@SWR      ;INHIBIT ALL PRINTOUT??
(1)  005430  001403                          BEQ     1$              ;IF NOT, GO TYPE
(1)  005432  062716  000002                  ADD     #2,(SP)         ;SKIP OVER MESSAGE POINTER
(1)  005436  000002                          RTI                     ;RETURN TO WHERE PROCEDURE WAS INVOKED
(1)  005440                          1$:
(2)                                  .SBTTL  TYPE ROUTINE
(2)
(3)                                  ;;**************************************************************
(2)                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
(2)                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
(2)                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(2)                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(2)                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(2)                                  ;*
(2)                                  ;*CALL:
(2)                                  ;*1) USING A TRAP INSTRUCTION
(2)                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(2)                                  ;*OR
(2)                                  ;*      TYPE
(2)                                  ;*      MESADR
(2)                                  ;*
(2)
(2)  005440  105737  001177          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(2)  005444  100002                          BPL     1$              ;;BR IF YES
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(2)  005446  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
(2)  005450  000430                          BR      3$              ;;LEAVE
(2)  005452  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
(2)  005454  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(2)  005460  122737  000001  001254          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
(2)  005466  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
(2)  005470  132737  000100  001255          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
(2)  005476  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
(2)  005500  010037  005510                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
(2)  005504  004737  006002                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
(2)  005510  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
(2)  005512  132737  000040  001255  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
(2)  005520  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
(2)  005522  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(2)  005524  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(2)  005526  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(2)  005530  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
(2)  005532  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(2)  005536  000002                          RTI                     ;;RETURN
(2)  005540  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(2)  005544  001430                          BEQ     8$
(2)  005546  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
(2)  005552  001006                          BNE     5$
(2)  005554  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
(2)  005556  104402                          TYPE                    ;;TYPE A CR AND LF
(2)  005560  001231                          $CRLF
(2)  005562  105037  005770                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(2)  005566  000755                          BR      2$              ;;GET NEXT CHARACTER
(2)  005570  004737  005652          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(2)  005574  123726  001176          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(2)  005600  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
(2)  005602  013746  001174                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(2)                                                                  ;;AND THE NULL CHAR.
(2)  005606  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
(2)  005612  002770                          BLT     6$              ;;BR IF NO- GO POP THE NULL OFF OF STACK
(2)  005614  004737  005652                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
(2)  005620  105337  005770                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(2)  005624  000770                          BR      7$              ;;LOOP
(2)
(2)                                  ;HORIZONTAL TAB PROCESSOR
(2)
(2)  005626  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(2)  005632  004737  005652          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
(2)  005636  132737  000007  005770          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(2)  005644  001372                          BNE     9$              ;;TAB STOP
(2)  005646  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
(2)  005650  000724                          BR      2$              ;;GET NEXT CHARACTER
(2)  005652                          $TYPEC:
(2)  005652  105777  173306                  TSTB    @$TKS           ;;CHAR IN KYBD BUFFER?                  ;MJD001
(2)  005656  100022                          BPL     10$             ;;BR IF NOT                             ;MJD001
(2)  005660  017746  173302                  MOV     @$TKB,-(SP)     ;;GET CHAR                              ;MJD001
(2)  005664  042716  177600                  BIC     #177600,(SP)    ;;STRIP EXTRANEOUS BITS                 ;MJD001
(2)  005670  122716  000023                  CMPB    #$XOFF,(SP)     ;;WAS CHAR XOFF                         ;MJD001
(2)  005674  001012                          BNE     102$            ;;BR IF NOT                             ;MJD001
(2)  005676                          101$:                                                                   ;MJD001
(2)  005676  105777  173262                  TSTB    @$TKS           ;;WAIT FOR CHAR                         ;MJD001
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(2)  005702  100375                          BPL     101$                                    ;MJD001
(2)  005704  117716  173256                 MOVB    @$TKB,(SP)      ;;GET CHAR              ;MJD001
(2)  005710  042716  177600                 BIC     #177600,(SP)    ;;STRIP IT              ;MJD001
(2)  005714  122716  000021                 CMPB    #$XON,(SP)      ;;WAS IT XON?           ;MJD001
(2)  005720  001366                          BNE     101$            ;;BR IF NOT             ;MJD001
(2)  005722                          102$:                                                   ;MJD001
(2)  005722  005726                          TST     (SP)+           ;;FIX STACK             ;MJD001
(2)  005724                          10$:                                                    ;MJD001
(2)  005724  105777  173240                 TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(2)  005730  100375                          BPL     10$                                     ;MJD001
(2)  005732  116677  000002  173232         MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(2)  005740  122766  000015  000002         CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(2)  005746  001003                          BNE     1$              ;;BRANCH IF NO
(2)  005750  105037  005770                 CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(2)  005754  000406                          BR      $TYPEX          ;;EXIT
(2)  005756  122766  000012  000002  1$:    CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(2)  005764  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
(2)  005766  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
(2)  005770  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
(2)  005772  000207                  $TYPEX: RTS     PC
(2)
(2)                                  .SBTTL  APT COMMUNICATIONS ROUTINE
(2)
(3)                                  ;;**************************************************************
(2)  005774  112737  000001  006240  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
(2)  006002  112737  000001  006236  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
(2)  006010  000403                          BR      $ATYC
(2)  006012  112737  000001  006240  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
(2)  006020                          $ATYC:
(4)  006020  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  006022  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(2)  006024  105737  006236                 TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
(2)  006030  001450                          BEQ     5$              ;;IF NOT:  BR
(2)  006032  122737  000001  001254         CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
(2)  006040  001031                          BNE     3$              ;;IF NOT:  BR
(2)  006042  132737  000100  001255         BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
(2)  006050  001425                          BEQ     3$              ;;IF NOT:  BR
(2)  006052  017600  000004                 MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
(2)  006056  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(2)  006064  005737  001234          1$:    TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
(2)  006070  001375                          BNE     1$              ;;IF NOT:  WAIT
(2)  006072  010037  001250                 MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
(2)  006076  105720                  2$:    TSTB    (R0)+           ;;FIND END OF MESSAGE
(2)  006100  001376                          BNE     2$
(2)  006102  163700  001250                 SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
(2)  006106  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
(2)  006110  010037  001252                 MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
(2)  006114  012737  000004  001234         MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
(2)  006122  000413                          BR      5$
(2)  006124  017637  000004  006150  3$:    MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
(2)  006132  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
(4)  006140  013746  177776                 MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
(2)  006144  004737  005440                 JSR     PC,$TYPE        ;;CALL TYPE MACRO
(2)  006150  000000                  4$:    .WORD   0
(2)  006152                          5$:
(2)  006152  105737  006240          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
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(2)  006156  001416                          BEQ     12$             ;;IF NOT:  BR
(2)  006160  005737  001254                  TST     $ENV            ;;RUNNING UNDER APT?
(2)  006164  001413                          BEQ     12$             ;;IF NOT:  BR
(2)  006166  005737  001234          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
(2)  006172  001375                          BNE     11$             ;;IF NOT:  WAIT
(2)  006174  017637  000004  001236          MOV     @4(SP),$FATAL   ;;GET ERROR #
(2)  006202  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(2)  006210  005237  001234                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
(2)  006214  105037  006240          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
(2)  006220  105037  006237                  CLRB    $LFLG           ;;CLEAR LOG FLAG
(2)  006224  105037  006236                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
(4)  006230  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(4)  006232  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(2)  006234  000207                          RTS     PC              ;;RETURN
(2)  006236     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
(2)  006237     000          $LFLG:  .BYTE   0               ;;LOG FLAG
(2)  006240     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
(2)          006242                  .EVEN
(2)          000200          APTSIZE=200
(2)          000001          APTENV=001
(2)          000100          APTSPOOL=100
(2)          000040          APTCSUP=040
(1)
(1)                                  ;STRING INPUT ROUTINE
(1)                                  ;--------------------------
(1)
(1)  006242  010346          .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
(1)  006244  010446                  MOV     R4,-(SP)        ;SAVE R4 ON STACK
(1)  006246  017637  000004  006264  MOV     @4(SP),.MSG     ;GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
(1)  006254  062766  000002  000004  ADD     #2,4(SP)        ;POINT TO INSTRUCTION AFTER ADDRESS POINTER
(1)  006262  104402          .INST1: TYPE                    ;PRINT THE MESSAGE
(1)  006264  000000          .MSG:   0                       ;MESSAGE IS POINTED TO FROM HERE
(1)  006266  012704  011262          MOV     #INBUF,R4       ;POINT R4 TO THE INPUT BUFFER
(1)  006272  012703  000007          MOV     #7,R3           ;SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
(1)  006276  105777  172662  1$:     TSTB    @$TKS           ;HAS A CHARACTER BEEN RECEIVED?
(1)  006302  100375                  BPL     1$              ;IF NO, KEEP WAITING FOR IT
(1)  006304  117714  172656          MOVB    @$TKB,(R4)      ;IF YES, SAVE IT IN THE INPUT BUFFER
(1)  006310  142714  000200          BICB    #200,(R4)       ;KEEP ONLY THE 7-BIT ASCII INFORMATION
(1)  006314  122714  000023          CMPB    #$XOFF,(R4)     ;IS IT A XOFF?                  ;;DSH-BHL
(1)  006320  001014                  BNE     83$             ;BR IF NOT                      ;;DSH
(1)  006322  105777  172636  101$:   TSTB    @$TKS           ;WAIT FOR A CHARACTER           ;;DSH-BHL
(1)  006326  100375                  BPL     101$                                            ;;DSH-BHL
(1)  006330  117714  172632          MOVB    @$TKB,(R4)      ;GET CHARACTER                  ;;DSH-BHL
(1)  006334  142714  000200          BICB    #200,(R4)       ;STRIP DOWN CHARACTER           ;;DSH-BHL
(1)  006340  122714  000021          CMPB    #$XON,(R4)      ;WAIT FOR A XON?                ;;DSH-BHL
(1)  006344  001366                  BNE     101$            ;GET NEXT CHAR IF NOT           ;;DSH-BHL
(1)  006346  105724                  TSTB    (R4)+           ;POP STACK                      ;;DSH
(1)  006350  000752                  BR      1$              ;WAIT FOR A CHAR                ;;DSH
(1)  006352  122714  000021  83$:    CMPB    #$XON,(R4)      ;IS IT A RANDOM XON             ;;DSH-BHL
(1)  006356  001002                  BNE     102$            ;BR IF NO                       ;;DSH-BHL
(1)  006360  105724                  TSTB    (R4)+           ;ELSE, POP STACK                ;;DSH-BHL
(1)  006362  000745                  BR      1$              ;GO GET NEXT CHAR               ;;DSH-BHL
(1)  006364  122724  000015  102$:   CMPB    #15,(R4)+       ;IS IT <CR> ?
(1)  006370  001417                  BEQ     INSTR2          ;IF SO, TERMINATE THE INPUT SEQUENCE
(1)  006372  105777  172572  2$:     TSTB    @$TPS           ;IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
(1)  006376  100375                  BPL     2$              ;IF WE CAN'T, WAIT UNTIL WE CAN
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(1)  006400  017777  172562  172564          MOV     @$TKB,@$TPB     ;ECHO THE CHARACTER BACK
(1)  006406  005303                          DEC     R3              ;REDUCE THE NUMBER OF CHARACTERS RECEIVED
(1)  006410  001332                          BNE     1$              ;IF WE DON'T HAVE 7, GO GET SOME MORE
(1)  006412  012604                          MOV     (SP)+,R4        ;IF WE HAVE 7, RESTORE R4
(1)  006414  012603                          MOV     (SP)+,R3        ;RESTORE R3
(1)  006416  010346                .INSTE:   MOV     R3,-(SP)        ;SAVE R3 ON THE STACK
(1)  006420  010446                          MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  006422  104402  001230                  TYPE    ,$QUES          ;PRINT A QUESTION MARK... WHAT'S GOING ON?
(1)  006426  000715                          BR      .INST1          ;GO PRINT THE MESSAGE AGAIN
(1)  006430  012604                INSTR2:   MOV     (SP)+,R4        ;RESTORE R4
(1)  006432  012603                          MOV     (SP)+,R3        ;RESTORE R3
(1)  006434  000002                          RTI                     ;RETURN TO THE MAIN PROCEDURE
(1)
(1)                                          ;CONVERT ASCII STRING TO OCTAL
(1)                                          ;----------------------------
(1)
(1)  006436  010546                .PARAM:   MOV     R5,-(SP)        ;SAVE R5 ON THE STACK
(1)  006440  010446                          MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  006442  016605  000004                  MOV     4(SP),R5        ;GET THE SETUP INFORMATION POINTER
(1)  006446  012537  006626                  MOV     (R5)+,LOLIM     ;SET THE LOW LIMIT FOR THE INPUT
(1)  006452  012537  006630                  MOV     (R5)+,HILIM     ;SET THE HIGH LIMIT FOR THE INPUT
(1)  006456  012537  006632                  MOV     (R5)+,DEVADR    ;SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
(1)  006462  112537  006634                  MOVB    (R5)+,LOBITS    ;GET THE MASK OF THE INCORRECT BITS
(1)  006466  112537  006635                  MOVB    (R5)+,ADRCNT    ;GET THE COUNT OF ITEMS TO BE STORED
(1)  006472  010566  000004                  MOV     R5,4(SP)        ;POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
(1)  006476  005005                PARAM1:   CLR     R5              ;INITIALIZE THE ASCII TO OCTAL RESULT WORD
(1)  006500  012704  011262                  MOV     #INBUF,R4       ;POINT TO THE INPUT BUFFER
(1)  006504  122714  000015                  CMPB    #15,(R4)        ;IS THIS CHARACTER A CARRIAGE RETURN?
(1)  006510  001420                          BEQ     PARERR          ;IF SO, PRINT THE MESSAGE AGAIN
(1)  006512  121427  000060          1$:     CMPB    (R4),#60        ;IS THIS CHARACTER BELOW THE NUMERIC RANGE?
(1)  006516  002415                          BLT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  006520  121427  000067                  CMPB    (R4),#67        ;IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
(1)  006524  003012                          BGT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  006526  142714  000060                  BICB    #60,(R4)        ;ISOLATE THE NUMBER THE CHARACTER REPRESENTS
(1)  006532  152405                          BISB    (R4)+,R5        ;CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
(1)  006534  122714  000015                  CMPB    #15,(R4)        ;IS THE NEXT CHARACTER A CARRIAGE RETURN?
(1)  006540  001406                          BEQ     LIMITS          ;IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
(1)  006542  006305                          ASL     R5              ;CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
(1)  006544  006305                          ASL     R5              ;CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
(1)  006546  006305                          ASL     R5              ;MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
(1)                                                                  ;NEXT THREE BITS
(1)  006550  000760                          BR      1$              ;GO GET THE NEXT CHARACTER
(1)  006552  104404                PARERR:   INSTER                  ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
(1)  006554  000750                          BR      PARAM1          ;TRY GETTING THE PARAMETERS AGAIN
(1)
(1)                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(1)                                          ;-------------- ---- -- --------------
(1)
(1)  006556  020537  006630        LIMITS:   CMP     R5,HILIM        ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
(1)  006562  101373                          BHI     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  006564  020537  006626                  CMP     R5,LOLIM        ;IS THE RESULT LOWER THAN ALLOWED?
(1)  006570  103770                          BLO     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  006572  133705  006634                  BITB    LOBITS,R5       ;ARE ANY INCORRECT BITS SET IN THE RESULT?
(1)  006576  001365                          BNE     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)
(1)                                          ;STORE NUMBER AT SPECIFIED ADDRESS
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(1)
(1)  006600  013704  006632                  MOV     DEVADR,R4       ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
(1)  006604  010524                  1$:     MOV     R5,(R4)+        ;STORE THE RESULT
(1)  006606  062705  000002                  ADD     #2,R5           ;CALCULATE THE NEXT DATUM
(1)  006612  105337  006635                  DECB    ADRCNT          ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
(1)  006616  001372                         BNE     1$              ;IF NOT, GO STORE THE NEXT DATUM
(1)  006620  012604                         MOV     (SP)+,R4        ;RESTORE R4
(1)  006622  012605                         MOV     (SP)+,R5        ;RESTORE R5
(1)  006624  000002                         RTI                     ;RETURN TO THE MAIN PROGRAM
(1)
(1)  006626  000000                  LOLIM:  0                       ;LOWEST ACCEPTABLE VALUE
(1)  006630  000000                  HILIM:  0                       ;HIGHEST ACCEPTABLE
(1)  006632  000000                  DEVADR: 0                       ;LOCATION WHERE RESULT WILL BE STORED
(1)  006634     000                  LOBITS: .BYTE   0               ;INCORRECT BITS MASK
(1)  006635     000                  ADRCNT: .BYTE   0               ;COUNT OF ITEMS TO BE STORED
(1)
(1)                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
(1)                                          ;-------------------------------------
(1)
(1)  006636  016637  000004  001402  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
(1)
(1)                                          ;SAVE R0-R5
(1)
(1)  006644  010537  001214          SV05:   MOV     R5,$REG5        ;SAVE R5
(1)  006650  010437  001212                  MOV     R4,$REG4        ;SAVE R4
(1)  006654  010337  001210                  MOV     R3,$REG3        ;SAVE R3
(1)  006660  010237  001206                  MOV     R2,$REG2        ;SAVE R2
(1)  006664  010137  001204                  MOV     R1,$REG1        ;SAVE R1
(1)  006670  010037  001202                  MOV     R0,$REG0        ;SAVE R0
(1)  006674  000002                          RTI                     ;LEAVE.
(1)
(1)                                          ;RESTORE R0-R5
(1)
(1)  006676  013700  001202          .RES05: MOV     $REG0,R0        ;RESTORE R0
(1)  006702  013701  001204                  MOV     $REG1,R1        ;RESTORE R1
(1)  006706  013702  001206                  MOV     $REG2,R2        ;RESTORE R2
(1)  006712  013703  001210                  MOV     $REG3,R3        ;RESTORE R3
(1)  006716  013704  001212                  MOV     $REG4,R4        ;RESTORE R4
(1)  006722  013705  001214                  MOV     $REG5,R5        ;RESTORE R5
(1)  006726  000002                          RTI                     ;LEAVE
(1)
(1)                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
(1)                                          ;------------------------------------------ -----------
(1)
(1)  006730  104402  001231          .CONVR: TYPE    ,$CRLF          ;PRINT A CARRIAGE RETURN
(1)  006734  010046                  .CNVRT: MOV     R0,-(SP)        ;SAVE R0
(1)  006736  010146                          MOV     R1,-(SP)        ;SAVE R1
(1)  006740  010346                          MOV     R3,-(SP)        ;SAVE R3
(1)  006742  010446                          MOV     R4,-(SP)        ;SAVE R4
(1)  006744  010546                          MOV     R5,-(SP)        ;SAVE R5
(1)  006746  017601  000012                  MOV     @12(SP),R1      ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
(1)  006752  062766  000002  000012          ADD     #2,12(SP)       ;POINT TO WHERE MAIN PROGRAM WILL RESUME
(1)  006760  012137  007104                  MOV     (R1)+,WRDCNT    ;GET NUMBER OF WORDS TO BE PRINTED
(1)  006764  112105                  1$:     MOVB    (R1)+,R5        ;GET THE NUMBER OF CHARACTERS TO BE PRINTED
(1)  006766  112100                          MOVB    (R1)+,R0        ;GET THE NUMBER OF SPACES TO PRINT
(1)  006770  013104                          MOV     @(R1)+,R4       ;COPY THE WORD TO BE CONVERTED
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(1)  006772  110537  007106              MOVB    R5,CHRCNT       ;COPY THE CHARACTER COUNT
(1)  006776  010403                3$:   MOV     R4,R3           ;COPY THE ARGUMENT WORD AGAIN
(1)  007000  042703  177770              BIC     #^C<7>,R3       ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
(1)  007004  062703  000060              ADD     #060,R3         ;MAKE AN ASCII CHARACTER OUT OF THEM
(1)  007010  110346                      MOVB    R3,-(SP)        ;SAVE THAT CHARACTER
(1)  007012  006004                      ROR     R4              ;MOVE THE NEXT THREE BITS INTO PLACE
(1)  007014  006204                      ASR     R4              ;MOVE THEM AGAIN
(1)  007016  006204                      ASR     R4              ;AND FINALLY A THIRD TIME
(1)  007020  005305                      DEC     R5              ;REDUCE CHARACTER COUNT.ARE ALL CHARACTERS
(1)                                                              ;BUILT?
(1)  007022  001365                      BNE     3$              ;IF NO, GO BUILD THE NEXT ONE.
(1)  007024  012703  011366              MOV     #MDATA,R3       ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
(1)  007030  112623                4$:   MOVB    (SP)+,(R3)+     ;STORE THE CHARACTER, STARTING WITH THE MOST
(1)  007032  105337  007106              DECB    CHRCNT          ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
(1)  007036  001374                      BNE     4$              ;IF NO, GO TRANSFER ANOTHER
(1)  007040  105700                      TSTB    R0              ;ARE ANY SPACES TO BE PRINTED?
(1)  007042  001404                      BEQ     6$              ;IF NO, DON'T SET UP ANY
(1)  007044  112723  000040        5$:   MOVB    #040,(R3)+      ;ADD A SPACE TO THE OUTPUT BUFFER
(1)  007050  105300                      DECB    R0              ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
(1)  007052  001374                      BNE     5$              ;IF YES, GO ADD ANOTHER SPACE
(1)  007054  105013                6$:   CLRB    (R3)            ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
(1)  007056  104402  011366              TYPE    ,MDATA          ;PRINT THE STRING WE JUST BUILT
(1)  007062  005337  007104              DEC     WRDCNT          ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
(1)  007066  001336                      BNE     1$              ;IF YES, GO CONVERT THEM
(1)  007070  012605                      MOV     (SP)+,R5        ;RESTORE R5
(1)  007072  012604                      MOV     (SP)+,R4        ;RESTORE R4
(1)  007074  012603                      MOV     (SP)+,R3        ;RESTORE R3
(1)  007076  012601                      MOV     (SP)+,R1        ;RESTORE R1
(1)  007100  012600                      MOV     (SP)+,R0        ;RESTORE R0
(1)  007102  000002                      RTI                     ;RETURN TO THE MAIN PROGRAM
(1)  007104  000000                WRDCNT: 0
(1)  007106     000                CHRCNT: .BYTE                   ;NUMBER OF CHARACTERS TO PRINT
(1)  007107     000                SPACNT: .BYTE   0               ;NUMBER OF SPACES TO PRINT
(1)
(1)  007110  000000                BINWRD: 0
(1)
(1)
(1)                                      ;TRAP DISPATCH SERVICE
(1)                                      ;ARGUMENT OF TRAP IS EXTRACTED
(1)                                      ;AND USED AS OFFSET TO OBTAIN POINTER
(1)                                      ;TO SELECTED SUBROUTINE
(1)
(1)  007112  010046                .TRPSR: MOV     R0,-(SP)        ;SAVE R0. USE R0 TO FIND TRAP ROUTINE
(1)  007114  016600  000002              MOV     2(SP),R0        ;GET TRAP ADDRESS
(1)  007120  005740                      TST     -(R0)           ;GET TRAP
(1)  007122  111000                      MOVB    (R0),R0         ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
(1)  007124  006300                      ASL     R0              ;POSITION OFFSET FOR TABLE INDEXING
(1)  007126  016000  002002              MOV     .TRPTAB(R0),R0  ;PLACE INDEXED ADDRESS OF TABLE IN R0
(1)  007132  000200                      RTS     R0              ;TRANSFER TO THAT ADDRESS AND RESTORE OLD R0
(1)
(1)                                      ;DEVICE CLEAR ROUTINE
(1)                                      ;ISSUE A DEVICE CLEAR
(1)                                      ;--------------------
(1)  007134                        .DEVICE.CLR:
(1)  007134  052777  000020  172700      BIS     #DCLR,@DZCSR    ;SET DCLR
(1)  007142  032777  000020  172672  1$:  BIT     #DCLR,@DZCSR    ;DID IT CLEAR?
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(1)  007150  001374                        BNE     1$              ;BR IF NO
(1)  007152  000002                        RTI                     ;EXIT ROUTINE
(1)
(1)                                        ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
(1)                                        ;------------------- ---  - --- --------------  ------- ---
(1)  007154  104413              .DCLASM:DEVICE.CLR              ;ISSUE A DEVICE CLEAR
(1)  007156  153777  001417  172656        BISB    MNTFLG,@DZCSR   ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
(1)  007164  000002                        RTI                     ;RETURN TO CALLING ROUTINE
(1)
(1)  007166                      .DELAY:
(1)  007166  010046                        MOV     R0,-(SP)        ;SAVE R0
(1)  007170  013700  007204                MOV     DLYCNT,R0       ;SET COUNT
(1)  007174  005300              1$:       DEC     R0              ;DELAY
(1)  007176  001376                        BNE     1$              ;
(1)  007200  012600                        MOV     (SP)+,R0        ;RESTORE R0
(1)  007202  000002                        RTI                     ;LEAVE ROUTINE
(1)  007204  000001              DLYCNT:   .WORD     1             ;PATCHABLE LOC FOR MORE TIME
(1)
(1)                                        ;ADVANCE TO NEXT TEST HANDLER
(1)                                        ;--  -- ------ - -- ----   -
(1)
(1)  007206  013716  001360      .ADVANCE:MOV     NEXT,(SP)       ;CRUNCH STACK WITH ADDRESS OF SCOPE CALL
(1)  007212  005037  001362                CLR     LOCK            ;RESET TIGHT LOOP ADDRESS
(1)  007216  000002                        RTI                     ;CHECK TO SEE IF OLD TEST GETS REPEATED
(1)
(1)                                        ;ERROR HANDLER
(1)                                        ;-------------
(1)
(1)  007220  004737  007642      $ERROR:   JSR     PC,SERV.G       ;FIND OUT IF <^G> WAS HIT
(1)  007224  032777  010000  171726        BIT     #SW12,@SWR      ;BELL ON ERROR?
(1)  007232  001406                        BEQ     XBX             ;BR IF NO BELL
(1)  007234  105777  171730                TSTB    @$TPS           ;TTY READY.
(1)  007240  100003                        BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
(1)  007242  112777  000207  171722        MOVB    #207,@$TPB      ;PUSH A BELL AT THE TTY.
(1)  007250  032777  020000  171702  XBX:   BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
(1)  007256  001113                        BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
(1)  007260  021637  001136                CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
(1)  007264  001404                        BEQ     1$              ;BR IF YES
(1)  007266  011637  001136                MOV     (SP),$ERRPC     ;RECORD BEING HERE
(1)  007272  105037  001123                CLRB    $ERFLG          ;PREPARE HEADER
(1)  007276  104407              1$:       SAV05                   ;SAVE ALL PROC REGISTERS
(1)  007300  011605                        MOV     (SP),R5         ;GET THE PC OF ERROR
(1)  007302  162705  000002                SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
(1)  007306  011504                        MOV     (R5),R4         ;GET ERROR INSTRUCTION
(1)  007310  110437  001134                MOVB    R4,$ITEMB       ;COPY TEST NUMBER FOR APT HANDLING
(1)  007314  006304                        ASL     R4              ;MULT BY TWO
(1)  007316  061504                        ADD     (R5),R4         ;DOUBLE IT
(1)  007320  006304                        ASL     R4              ;MULT AGAIN
(1)  007322  042704  177001                BIC     #177001,R4      ;CLEAR JUNK
(1)  007326  062704  030340                ADD     #.ERRTAB,R4     ;GET POINTER
(1)  007332  012437  007456                MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
(1)  007336  012437  007470                MOV     (R4)+,DATAHD    ;GET DATA HEADRER
(1)  007342  011437  007502                MOV     (R4),DATABP     ;GET DATA TABLE
(1)  007346  105737  001123                TSTB    $ERFLG          ;TYPE HEADER
(1)  007352  001403                        BEQ     TYPMSG          ;BR IF YES
(1)  007354  005737  007502                TST     DATABP          ;DOES DATA TABLE EXIST?
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(1) 007360 001044                      BNE     TYPDAT          ;BR IF YES.
(1) 007362 104402 001231       TYPMSG: TYPE    .$CRLF          ;TYPE A CARRIAGE RETURN
(1) 007366 104402 001231               TYPE    .$CRLF          ;AND TYPE ANOTHER
(1) 007372 005737 001362               TST     LOCK
(1) 007376 001402                      BEQ     1$
(1) 007400 104402 010756               TYPE    .MASTEK
(1) 007404 104402 010744       1$:     TYPE    .MTSTN
(1) 007410 104412 007634               CNVRT   .XTSTN          ;SHOW IT
(1) 007414 104402 011033               TYPE    .MERRPC         ;TYPE PC.
(1) 007420 104412 007626               CNVRT   .ERTABO         ;SHOW IT
(1) 007424 104402 010706               TYPE    .MCSRX
(1) 007430 104412 005072               CNVRT   .XCSR
(1) 007434 104402 001231               TYPE    .$CRLF          ;GIVE A CR/LF
(1) 007440 112737 177777 001123        MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
(1) 007446 005737 007456               TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
(1) 007452 001402                      BEQ     WTBS.FM         ;BR IF NO.
(1) 007454 104402                      TYPE                    ;TYPE
(1) 007456 000000              ERRMSG: 0                       ;    ERROR MESSAGE
(1) 007460                     WTBS.FM:                        ;
(1) 007460 005737 007470               TST     DATAHD          ;DATA HEADER?
(1) 007464 001402                      BEQ     TYPDAT          ;BR IF NO
(1) 007466 104402                      TYPE                    ;TYPE
(1) 007470 000000              DATAHD: 0                       ;    DATA HEADER
(1) 007472 005737 007502       TYPDAT: TST     DATABP          ;DATA TABLE?
(1) 007476 001402                      BEQ     RESREG          ;BR IF NO.
(1) 007500 104411                      CONVRT                  ;SHOW
(1) 007502 000000              DATABP: 0                       ;    DATA TABLE
(1) 007504 104410              RESREG: RES05                   ;RESTORE PROC REGISTERS
(1) 007506 122737 000001 001254 HALTS: CMPB    #APTENV,$ENV    ;IS APT RUNNING?
(1) 007514 001007                      BNE     2$              ;SKIP APT CALL IF NOT
(1) 007516 113737 001134 007530        MOVB    $ITEMB,7$       ;COPY ERROR NUMBER
(1) 007524 004737 006012               JSR     PC,$ATY4        ;CALL APT SERVICE
(1) 007530 000000              7$:     .WORD   0               ;ERROR NUMBER STUCK HERE
(1) 007532 000777              8$:     BR      8$              ;LOCK UP HERE
(1) 007534 022737 005056 000042 2$:    CMP     #$ENDAD,@#42    ;CHECK TO SEE IF IN ACT-11 MODE
(1) 007542 001403                      BEQ     1$              ;IF SO, HANDLE ACCORDINGLY
(1) 007544 005777 171410               TST     @SWR            ;HALT ON ERROR?
(1) 007550 100004                      BPL     EXITER          ;BR IF NO HALT ON ERROR
(1) 007552 016677 000002 171402 1$:    MOV     2(SP),@DISPLAY  ;SHOW ERROR PC IN DATA DISPLAY
(1) 007560 000000                      HALT                    ;HALT
(1) 007562 005237 001132       EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
(1) 007566 032777 000400 171364        BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
(1) 007574 001007                      BNE     1$              ;BR IF YES
(1) 007576 032777 002000 171354        BIT     #SW10,@SWR      ;GOTO NEXT TEST?
(1) 007604 001407                      BEQ     2$              ;BR IF NO
(1) 007606 013737 001360 001126        MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
(1) 007614 012706 001120       1$:     MOV     #STACK,SP       ;RESET SP
(1) 007620 000177 171302               JMP     @$LPADR         ;GOTO SPECIFIED TEST
(1) 007624 000002              2$:     RTI                     ;RETURN
(1) 007626 000001              ERTABO: 1
(1) 007630     006     002             .BYTE   6,2
(1) 007632 001402                      SAVPC
(1) 007634 000001              XTSTN:  1
(1) 007636     002     002             .BYTE   2,2
(1) 007640 001122                      $TSTNM
(1) 007642 022737 177570 001160 SERV.G: CMP     #177570,SWR     ;IS THE SWITCH REGISTER HARDWIRED?
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(1)  007650  001002                    BNE     99$             ;IF SO, IGNORE ↑G
(1)  007652  000137  010260            JMP     6$                                      ;;DSH BHL
(1)  007656  017746  171304    99$:    MOV     @$TKB,-(SP)     ;OTHERWISE, GET THE LAST CHARACTER TYPED
(1)  007662  042716  177600            BIC     #177600,(SP)    ;STRIP CHAR             ;;DSH-BHL
(1)  007666  122716  000023            CMPB    #$XOFF,(SP)     ;IS IT A XOFF           ;;DSH-BHL
(1)  007672  001012                    BNE     102$            ;BR IF NO              ;;DSH-BHL
(1)
(1)  007674  105777  171264    101$:   TSTB    @$TKS           ;WAIT FOR A CHAR        ;;DSH-BHL
(1)  007700  100375                    BPL     101$                                    ;;DSH BHL
(1)  007702  117716  171260            MOVB    @$TKB,(SP)      ;GET THE CHAR           ;;DSH BHL
(1)  007706  042716  177600            BIC     #177600,(SP)    ;STRIP CHAR             ;;DSH-BHL
(1)  007712  122716  000021            CMPB    #$XON,(SP)      ;IS IT A XON            ;;DSH-BHL
(1)  007716  001366                    BNE     101$            ;BR IF NO              ;;DSH-BHL
(1)
(1)  007720  122716  000021    102$:   CMPB    #$XON,(SP)      ;IS IT RANDOM XON ?     ;;DSH
(1)  007724  001002                    BNE     7$              ;BR IF NOT              ;;DSH
(1)  007726  005726                    TST     (SP)+           ;POP STACK              ;;DSH
(1)  007730  000553                    BR      6$              ;IGNORE XON CHAR        ;;DSH
(1)
(1)  007732  122726  000007    7$:     CMPB    #7,(SP)+        ;IS IT ↑G?
(1)  007736  001150                    BNE     6$              ;IF NOT, IGNORE INPUT
(1)  007740  032777  004000  171216    BIT     #4000,@$TKS     ;RX BUSY?
(1)  007746  001335                    BNE     SERV.G          ;BR IF YES
(1)  007750  017737  171204  010302    MOV     @SWR,90$        ;SAVE (SWR).
(1)  007756  013777  010302  171174  1$:     MOV     90$,@SWR        ;
(1)  007764  104402  010262            TYPE    ,89$            ;
(1)  007770  104412  010274            CNVRT   ,88$            ;
(1)  007774  104402  010304            TYPE    ,91$            ;
(1)  010000  105777  171160    9$:     TSTB    @$TKS           ;WAIT FOR DONE.
(1)  010004  100375                    BPL     . 4
(1)  010006  017746  171154            MOV     @$TKB, (SP)     ;
(1)  010012  042716  177600            BIC     #177600,(SP)    ;STRIP CHAR             ;;DSH-BHL
(1)  010016  122716  000023            CMPB    #$XOFF,(SP)     ;IS IT A XOFF           ;;DSH-BHL
(1)  010022  001012                    BNE     112$            ;BR IF NO              ;;DSH-BHL
(1)
(1)  010024  105777  171134    111$:   TSTB    @$TKS           ;WAIT FOR A CHAR        ;;DSH-BHL
(1)  010030  100375                    BPL     111$                                    ;;DSH-BHL
(1)  010032  117716  171130            MOVB    @$TKB,(SP)      ;GET THE CHAR           ;;DSH-BHL
(1)  010036  042716  177600            BIC     #177600,(SP)    ;STRIP CHAR             ;;DSH-BHL
(1)  010042  122716  000021            CMPB    #$XON,(SP)      ;IS IT A XON            ;;DSH-BHL
(1)  010046  001366                    BNE     111$            ;BR IF NO              ;;DSH-BHL
(1)
(1)  010050  122716  000021    112$:   CMPB    #$XON,(SP)      ;IS IT RANDOM XON ?     ;;DSH
(1)  010054  001002                    BNE     8$              ;BR IF NOT              ;;DSH
(1)  010056  005726                    TST     (SP)+           ;POP STACK              ;;DSH
(1)  010060  000747                    BR      9$              ;IGNORE XON CHAR        ;;DSH
(1)
(1)  010062  122726  000015    8$:     CMPB    #15,(SP)+       ;
(1)  010066  001472                    BEQ     5$              ;
(1)  010070  005077  171064            CLR     @SWR            ;
(1)  010074  105777  171070    2$:     TSTB    @$TPS           ;
(1)  010100  100375                    BPL     .-4
(1)  010102  016677  177776  171062    MOV     -2(SP),@$TPB    ;
(1)  010110  000241                    CLC                     ;
(1)  010112  006177  171042            ROL     @SWR            ;
(1)  010116  006177  171036            ROL     @SWR            ;
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(1)  010122  006177  171032                ROL     @SWR            ;
(1)  010126  103713                        BCS     1$              ;ERROR
(1)  010130  026627  177776  000060        CMP     -2(SP),#60      ;
(1)  010136  002707                        BLT     1$              ;
(1)  010140  026627  177776  000067        CMP     -2(SP),#67      ;
(1)  010146  003303                        BGT     1$              ;
(1)  010150  042766  177770  177776        BIC     #^C<7>,-2(SP)   ;
(1)  010156  056677  177776  170774        BIS      2(SP),@SWR     ;
(1)  010164  105777  170774          12$:  TSTB    @$TKS           ;
(1)  010170  100375                        BPL     .-4             ;
(1)  010172  017746  170770                MOV     @$TKB,-(SP)
(1)  010176  042716  177600                BIC     #177600,(SP)    ;STRIP CHAR                     ;;DSH-BHL
(1)  010202  122716  000023                CMPB    #$XOFF,(SP)     ;IS IT A XOFF                   ;;DSH-BHL
(1)  010206  001012                        BNE     122$            ;BR IF NO                       ;;DSH-BHL
(1)
(1)  010210  105777  170750          121$: TSTB    @$TKS           ;WAIT FOR A CHAR                ;;DSH-BHL
(1)  010214  100375                        BPL     121$                                            ;;DSH BHL
(1)  010216  117716  170744                MOVB    @$TKB,(SP)      ;GET THE CHAR                   ;;DSH-BHL
(1)  010222  042716  177600                BIC     #177600,(SP)    ;STRIP CHAR                     ;;DSH-BHL
(1)  010226  122716  000021                CMPB    #$XON,(SP)      ;IS IT A XON                    ;;DSH BHL
(1)  010232  001366                        BNE     121$            ;BR IF NO                       ;;DSH-BHL
(1)
(1)  010234  122716  000021          122$: CMPB    #$XON,(SP)      ;IS IT RANDOM XON ?             ;;DSH
(1)  010240  001002                        BNE     10$             ;BR IF NOT                      ;;DSH
(1)  010242  005726                        TST     (SP)+           ;POP STACK                      ;;DSH
(1)  010244  000747                        BR      12$             ;IGNORE XON CHAR                ;;DSH
(1)
(1)  010246  122726  000015          10$:  CMPB    #15,(SP)+
(1)  010252  001310                        BNE     2$              ;
(1)  010254  104402  001231          5$:   TYPE    ,$CRLF          ;
(1)  010260  000207                  6$:   RTS     PC
(1)
(1)  010262  020200  051450  051127  89$:   .ASCIZ  <200>? (SWR)=/?
(1)  010270  036451  000057
(1)                                        .EVEN
(1)  010274  000001                  88$:   1
(1)  010276     006     000                .BYTE   6,0
(1)  010300  010302                        90$
(1)  010302  000000                  90$:   .WORD   0
(1)  010304  036457  000057          91$:   .ASCIZ  ?/=/?
(1)                                        .EVEN
(2)                                        .SBTTL  POWER DOWN AND UP ROUTINES
(2)
(3)                                        ;;*****************************************************************
(2)                                        ;POWER DOWN ROUTINE
(2)  010310  012737  010454  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
(2)  010316  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
(4)  010324  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  010326  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(4)  010330  010246                          MOV     R2, (SP)        ;;PUSH R2 ON STACK
(4)  010332  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(4)  010334  010446                          MOV     R4, (SP)        ;;PUSH R4 ON STACK
(4)  010336  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(4)  010340  017746  170614                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
(2)  010344  010637  010460                  MOV     SP,$SAVR6       ;;SAVE SP
(2)  010350  012737  010362  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
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(2)  010356  000000                          HALT
(2)  010360  000776                          BR      .-2             ;;HANG UP
(2)
(3)                                  ;;*****************************************************************
(2)                                  ;POWER UP ROUTINE
(2)  010362  012737  010454  000024  $PWRUP: MOV     @$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
(2)  010370  013706  010460                  MOV     $SAVR6,SP       ;;GET SP
(2)  010374  005037  010460                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
(2)  010400  005237  010460          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
(2)  010404  001375                          BNE     1$              ;;OF  WORD
(4)  010406  012677  170546                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
(4)  010412  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
(4)  010414  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
(4)  010416  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
(4)  010420  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
(4)  010422  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(4)  010424  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(2)  010426  012737  010310  000024          MOV     @$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
(2)  010434  012737  000340  000026          MOV     @340,@#PWRVEC+2 ;;PRIO:7
(2)  010442  104402                          TYPE                    ;;REPORT THE POWER FAILURE
(2)  010444  010462                  $PWRMG: .WORD   MPFAIL          ;;POWER FAIL MESSAGE POINTER
(2)  010446  012716                          MOV     (PC)+,(SP)      ;;RESTART AT RESTART
(2)  010450  012076                  $PWRAD: .WORD   RESTART         ;;RESTART ADDRESS
(2)  010452  000002                          RTI
(2)  010454  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
(2)  010456  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
(2)  010460  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
(2)  010462  050200  051127  043040  MPFAIL: .ASCIZ  <200>/PWR FAILED. RESTART AT LAST TEST /
(2)  010525     200  047105  020104  MEPASS: .ASCIZ  <200>/END PASS CZDZA-I  /
(2)  010550  051200  047125  044516  MR:     .ASCIZ  <200>/RUNNING   /
(2)  010564  050200  047522  051107  MERR2:  .ASCIZ  <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2)  010633     200  047111  052523  MERR3:  .ASCIZ  <200>/INSUFFICIENT DATA!/
(2)  010657     200  047514  045503  MLOCK:  .ASCIZ  <200>/LOCK ON SELECTED TEST/
(2)  010706  051503  035122  000040  MCSRX:  .ASCIZ   /CSR: /
(2)  010714  042526  035103  000040  MVECX:  .ASCIZ  /VEC: /
(2)  010722  040520  051523  051505  MPASSX: .ASCIZ  /PASSES: /
(2)  010733     105  051122  051117  MERRX:  .ASCIZ  /ERRORS: /
(2)  010744  042524  052123  047040  MTSTN:  .ASCIZ  /TEST NO: /
(2)  010756  020052     000         MASTEK: .ASCIZ  /* /
(2)  010761     200  042523  020124  MNEW:   .ASCIZ  <200>/SET SWITCH REG TO DZ11'S DESIRED ACTIVE./
(2)  011033     120  035103  000040  MERRPC: .ASCIZ  /PC: /
(2)  011040  046600  050101  047440  XHEAD:  .ASCIZ  <200>/MAP OF DZ11 STATUS/<200>
(2)  011065     200  046111  042514  MBADLN: .ASCIZ  <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2)          011130                  .EVEN
(2)  011130  000002                  XSTATQ: 2
(2)  011132     006     003                  .BYTE   6,3
(2)  011134  001220                          $TMP1
(2)  011136     006     002                  .BYTE   6,2
(2)  011140  001222                          $TMP2
(1)                                  .EVEN
(2)                                                  ; -$SETFLG-------------------------------
(2)                                  ;THIS ROUTINE ESTABLISHES WHICH MAINTENANCE MODE THE DEVICE IS IN
(2)                                  ;-------------------------- - -------------------------
(2)                                  ;E=EXTERNAL LOOP BACK
(2)                                  ;I=INTERNAL LOOP BACK
(2)                                  ;S=STAGGERED LOOP BACK
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(2)  011142  017605  000000          .SETFLG:MOV     @(SP),R5        ;PICK UP ADDRESS OF TAG
(2)  011146  042737  000040  011262          BIC     #40,INBUF       ;STRIP LOWER CASE
(2)  011154  122737  000105  011262          CMPB    #'E,INBUF       ;IS IT EXTERNAL LOOP BACK ?
(2)  011162  001005                          BNE     4$              ;NO
(2)  011164  013715  011254                  MOV     1$,(R5)         ;YES STORE INFO
(2)  011170  105037  001417                  CLRB    MNTFLG          ;SET MAINT BIT =0
(2)  011174  000422                          BR      7$              ;GET OUT
(2)  011176  122737  000111  011262  4$:     CMPB    #'I,INBUF       ;IS IT INTERNAL LOOP BACK ?
(2)  011204  001006                          BNE     5$              ;NO
(2)  011206  013715  011256                  MOV     2$,(R5)         ;YES STORE INFO
(2)  011212  112737  000010  001417          MOVB    #MAINT,MNTFLG   ;SET UP THE MAINTENANCE FLAG LOADER
(2)  011220  000410                          BR      7$              ;GET OUT
(2)  011222  122737  000123  011262  5$:     CMPB    #'S,INBUF       ;IS IT STAGGERED LOOP BACK ?
(2)  011230  001007                          BNE     6$              ;WHAT ?
(2)  011232  013715  011260                  MOV     3$,(R5)         ;YES STORE INFO
(2)  011236  105037  001417                  CLRB    MNTFLG          ;ZERO BITS
(2)  011242  062716  000002          7$:     ADD     #2,(SP)         ;POP AROUND
(2)  011246  000002                          RTI
(2)  011250  104404                  6$:     INSTER                  ;RETRY
(2)  011252  000733                          BR      .SETFLG         ;DITTO
(2)  011254  000200                  1$:     .WORD   200             ;EXTERNAL = E
(2)  011256  000000                  2$:     .WORD   0               ;INTERNAL = I
(2)  011260  100000                  3$:     .WORD   100000          ;STAGGERED = S
(2)                                  ; -  END 0 MACRO ******************
(2)                                                                  ; -$BUFFER-**********************************
(2)
(2)                                      ;BUFFERS FOR INPUT-OUTPUT
(2)
(2)  011262  000000                  INBUF:  0
(2)          011324                  .=.+40
(2)  011324  000000                  TEMP:   0
(2)          011366                  .=.+40
(2)  011366  000000                  MDATA:  0
(2)          011430                  .=.+40
(2)
(2)  011430  011637  011526          SET.PS: MOV     (SP),3$
(2)  011434  162737  000002  011526          SUB     #2,3$
(2)  011442  017737  000060  011530          MOV     @3$,4$
(2)  011450  022737  106427  011530          CMP     #106427,4$
(2)  011456  001003                          BNE     1$
(2)  011460  011637  011526                  MOV     (SP),3$
(2)  011464  000412                          BR      2$
(2)  011466  022737  106437  011530  1$:     CMP     #106437,4$
(2)  011474  001401                          BEQ     .+4
(2)  011476  000000                          HALT            ;RESERVED INSTRUCTION NOT "MTPS"
(2)  011500  011637  011526                  MOV     (SP),3$
(2)  011504  017737  000016  011526          MOV     @3$,3$
(2)  011512  062716  000002          2$:     ADD     #2,(SP)
(2)  011516  017766  000004  000002          MOV     @3$,2(SP)
(2)  011524  000002                          RTI
(2)  011526  000000                  3$:     0
(2)  011530  000000                  4$:     0
```

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(2)                                 ;  - END O MACRO ****************
(2)                                                     ; -$CYCLE-****************************
(2)
(2)                                 ;
(2)                                 ;ROUTINE USED TO "CYCLE" THROUGH UP TO SIXTEEN DZ11'S
(2)                                 ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
(2)                                 ;AND RUNS THE SPECIFIED DZ11'S.   THIS ROUTINE *MUST*
(2)                                 ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
(2)                                 ;SETUP NECESSARY.
(2)                                 ;
(2)  011532  005737  001404         CYCLE:  TST     DZACTV          ;ARE ANY DZ11'S TO BE TESTED?
(2)  011536  001004                         BNE     1$              ;BR IF OK.
(2)  011540  104402  010564                 TYPE    ,MERR2          ;NO DZ11'S SELECTED!!
(2)  011544  000000                         HALT                    ;STOP THE SHOW.
(2)  011546  000776                         BR      .-2             ;DISQUALIFY CONT. SW.
(2)  011550  013737  005374  001226   1$:    MOV     $MXCNT,$TIMES   ;RESTORE THE NUMBER OF ITERATIONS TO MAKE
(2)  011556  033737  001406  001404         BIT     RUN,DZACTV      ;IS THIS ONE "ACTIVE"
(2)  011564  001020                         BNE     2$              ;BR IF GOOD ONE FOUND.
(2)  011566  000241                         CLC
(2)  011570  006137  001406                 ROL     RUN             ;UPDATE POINTER
(2)  011574  005537  001406                 ADC     RUN             ;CATCH CARRY FROM RUN
(2)  011600  062737  000014  001412         ADD     #14,ACTIVE      ;UPDATE ADDRESS POINTER.
(2)  011606  022737  002000  001412         CMP     #DZ.END,ACTIVE  ;HAVE WE PASSED THE END OF THE MAP?
(2)  011614  001355                         BNE     1$              ;IF NO, KEEP GOING; NOT ALL TESTED FOR.
(2)  011616  012737  001500  001412         MOV     #DZ.MAP,ACTIVE  ;RESET ADDRESS POINTER.
(2)  011624  000751                         BR      1$              ;KEEP LOOKING FOR ACTIVE DZ11
(2)  011626  000241                 2$:     CLC
(2)  011630  006137  001406                 ROL     RUN             ;UPDATE POINTER.
(2)  011634  005537  001406                 ADC     RUN             ;CATCH CARRY.
(2)  011640  013700  001412                 MOV     ACTIVE,R0       ;GET ADDRESS POINTER.
(2)  011644  062737  000014  001412         ADD     #14,ACTIVE      ;UPDATE.
(2)  011652  022737  002000  001412         CMP     #DZ.END,ACTIVE
(2)                                                                 ;ALL DONE?
(2)  011660  001003                         BNE     3$              ;BR IF NO.
(2)  011662  012737  001500  001412         MOV     #DZ.MAP,ACTIVE  ;RESTORE POINTER.
(2)  011670  012037  001310          3$:    MOV     (R0)+,$BASE     ;LOAD SYSTEM CTRL. REG
(2)  011674  012037  002072                 MOV     (R0)+,DZRIV     ;LOAD VECTOR
(2)  011700  012037  030334                 MOV     (R0)+,DZPRT     ;LOAD PRIORITY
(2)  011704  113737  030335  001414         MOVB    DZPRT+1,EIAFLG  ;EIA OR 20MA
(2)  011712  042737  100000  030334         BIC     #BIT15,DZPRT    ;CLEAR FLAG
(2)  011720  012037  001364                 MOV     (R0)+,LINE      ;SET UP LINE DZ LINES ACTIVE
(2)  011724  012037  001366                 MOV     (R0)+,PAR       ;SET UP PARAMETERIZATION
(2)  011730  012037  001370                 MOV     (R0)+,MODE      ;SET UP MAINTENANCE MODE
(2)  011734  004737  030126                 JSR     PC,DZLEV        ;SET UP
(2)  011740  005737  000042                 TST     @#42            ;ARE WE UNDER MONITOR CONTROL?
(2)  011744  001051                         BNE     4$              ;IF YES, SKIP THIS SETUP
(2)  011746  032777  000002  167204         BIT     #SW01,@SWR      ;IF SW01=1, GET STARTING TEST #
(2)  011754  001445                         BEQ     4$              ;BR IF NO TEST IS TO BE INPUTTED
(2)  011756  104402  001231          7$:    TYPE    ,$CRLF
(3)                                                     ;  $GETPAR-********************************
(3)  011762  104403                         INSTR                   ;CALL THE STRING INPUT ROUTINE
(3)  011764  010744                         MTSTN                   ;POINTER TO MESSAGE TO BE PRINTED
(3)  011766  104405                         PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(3)  011770  000001                         1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(3)  011772  001000                         1000                    ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
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```
(3)  011774  001122                        $TSTNM                  ;POINTER TO MAP LOCATION TO BE FILLED
(3)  011776     000                        .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(3)  011777     001                        .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(3)                                ; -- END O MACRO ****************
(2)  012000  012700  013036                MOV     #TST1,R0
(2)  012004  022710  000004        5$:     CMP     #4,(R0)
(2)  012010  001020                        BNE     6$
(2)  012012  022760  012737  000002        CMP     #12737,2(R0)
(2)  012020  001014                        BNE     6$
(2)  012022  023760  001122  000004        CMP     $TSTNM,4(R0)    ;IS THIS THE TEST ?
(2)  012030  001010                        BNE     6$              ;IF NOT, DON'T PROCESS NUMBER
(2)  012032  010037  001126                MOV     R0,$LPADR       ;SAVE PC
(2)  012036  062737  000002  001126        ADD     #2,$LPADR       ;POP OVER SCOPE
(2)  012044  104402  001231                TYPE    ,$CRLF
(2)  012050  000412                        BR      8$
(2)  012052  005720                6$:     TST     (R0)+
(2)  012054  020027  023730                CMP     R0,#TLAST+10
(2)  012060  001351                        BNE     5$
(2)  012062  104402  001230                TYPE    ,$QUES
(2)  012066  000733                        BR      7$
(2)  012070  012737  013036  001126  4$:     MOV     #TST1,$LPADR    ;PREPARE TEST ADDRESS
(2)  012076                        8$:
(2)  012076  000177  167024        RESTART:JMP     @$LPADR         ;GO START TESTING.***WARNING!****
(2)                                                                ;THIS JUMP IS USED BY POWER UP ROUTINE!!!!
(2)
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```
(2)                                     ;-ROUTINE USED TO SET UP THE DIAGNOSTIC VIA APT.
(2)                                     ; IF BIT7 IN THE ENVIRONMENT MODE ($ENVM) BYTE IS SET,
(2)                                     ; THE PROGRAM WILL LOAD ITS PARAMETERS FROM THE ETABLE.
(2)
(2)  012102  012700  001500     SETAPT: MOV     #DZ.MAP,R0      ;POINT TO THE DEVICE MAP TABLE
(2)  012106  013701  001310             MOV     $BASE,R1        ;BUILD DEVICE ADDRESSES IN R1
(2)  012112  013702  001304             MOV     $VECT1,R2       ;BUILD DEVICE VECTORS IN R2
(2)  012116  042702  177007             BIC     #^C<770>,R2     ;STRIP AWAY OTHER INFORMATION
(2)
(2)  012122  113703  001305             MOVB    $VECT1+1,R3     ;LOAD THE INTERRUPT PRIORITY FROM R3
(2)  012126  106003                     RORB    R3              ;ALIGN THE NUMBER
(2)  012130  106003                     RORB    R3              ;ALIGN THE NUMBER
(2)  012132  106003                     RORB    R3              ;ALIGN THE NUMBER
(2)  012134  106003                     RORB    R3              ;ALIGN THE NUMBER
(2)  012136  106003                     RORB    R3              ;ALIGN THE NUMBER
(2)  012140  042703  177770             BIC     #^C<7>,R3       ;REMOVE ALL BUT BUS LEVEL NUMBER
(2)  012144  012704  001320             MOV     #$DDW0,R4       ;POINT TO THE BEGINNING OF DEVICE PARAMETERS
(2)  012150  013705  001312             MOV     $DEVM,R5        ;GET THE MAP OF ACTIVE DEVICES
(2)  012154  010537  001404             MOV     R5,DZACTV       ;SAVE THE BIT MAP
(2)  012160  006005                 1$: ROR     R5              ;GET A DEVICE SELECTION BIT
(2)  012162  103407                     BCS     3$              ;IF IT IS SELECTED, GO SET UP A MAP
(2)  012164  001425                     BEQ     5$              ;IF NO MORE ARE SELECTED, GET OUT OF SETUP
(2)  012166  005724                     TST     (R4)+           ;POINT TO NEXT DEVICE DESCRIPTOR
(2)  012170  062701  000010         2$: ADD     #10,R1          ;SET UP THE NEXT ADDRESS
(2)  012174  062702  000010             ADD     #10,R2          ;SET UP THE NEXT VECTOR GROUP
(2)  012200  000767                     BR      1$              ;GO SEE IF MORE DEVICES REMAIN
(2)  012202  010120                 3$: MOV     R1,(R0)+        ;LOAD DEVICE ADDRESS
(2)  012204  010220                     MOV     R2,(R0)+        ;LOAD THE VECTOR ADDRESS
(2)  012206  010320                     MOV     R3,(R0)+        ;LOAD THE INTERRUPT PRIORITY LEVEL
(2)  012210  013720  001314             MOV     $CDW1,(R0)+     ;GET THE NUMBER OF LINES IN OPERATION
(2)  012214  012420                     MOV     (R4)+,(R0)+     ;LOAD DEVICE PARAMETERS
(2)  012216  100006                     BPL     4$              ;IF 20MA MODE SELECTED, SET IT UP
(2)  012220  052760  100000  177772     BIS     #100000,-6(R0)  ;SET THE 20MA FLAG IN DZLVN
(2)  012226  042760  100000  177776     BIC     #100000,-2(R0)  ;CLEAR THE FLAG IN DZPARN
(2)  012234  005020                 4$: CLR     (R0)+           ;DEFAULT OPERATION TO INTERNAL MAINTENANCE MODE
(2)  012236  000754                     BR      2$              ;GO BUILD THE NEXT ADDRESS
(2)  012240  012710  177777         5$: MOV     #-1,(R0)        ;TERMINATE THE DEVICE MAP
(2)  012244  012737  001256  001160     MOV     #$SWREG,SWR     ;SET TO SOFTWARE APT SWITCH REGISTER
(2)  012252  000207                     RTS     PC              ;RETURN TO PRINT STATUS TABLE
(2)
(2)
(2)                                     ;*ROUTINE USED TO "AUTO SIZE" THE DZ11
(2)                                     ;*CSR AND VECTOR.
(2)                                     ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
(2)                                     ;*      ADDRESS RANGE (160000:163700)
(2)                                     ;*      AND THE VECTOR MAY BE ANY WHERE IN THE
(2)                                     ;*      FLOATING VECTOR RANGE (300:770)
(2)                                     ;*
(2)
(2)  012254                     AUTO.SIZE:
(2)  012254  000005                     RESET                   ;INSURE A BUS INIT.
(2)  012256  105337  001415             DECB    INIFLG          ;SHOW THAT I WAS HERE
(2)  012262  012702  001500     CSRMAP: MOV     #DZ.MAP,R2      ;LOAD MAP POINTER.
(2)  012266  012703  001320             MOV     #$DDW0,R3       ;POINT TO ETABLE DEVICE DESCRIPTOR WORDS
(2)  012272  005022                 1$: CLR     (R2)+           ;ZERO ENTIRE MAP
(2)  012274  022702  002000             CMP     #DZ.END,R2      ;ALL DONE?
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(2)  012300  001374                        BNE     1$              ;BR IF NO
(2)  012302  105037  001410                CLRB    DZNUM           ;SET OCTAL NUMBER OF DZ11'S TO 0
(2)  012306  012702  001500                MOV     #DZ.MAP,R2
(2)  012312  012701  160000                MOV     #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
(2)  012316  012737  012636  000004        MOV     #6$,@#4         ;SET FOR NON-EXISTENT DEVICE TIME OUT
(2)  012324  052711  000040          2$:   BIS     #BIT5,(R1)      ;TRY TO SET MASTER SCAN ENABLE
(2)  012330  052761  000200  000004        BIS     #BIT7,4(R1)     ;TRY TO TRANSMIT ON LINE 7
(2)  012336  005000                        CLR     R0              ;USE R0 AS A COUNTER
(2)  012340  005711                  7$:   TST     (R1)            ;HAS TRANSMITTER READY COME UP?
(2)  012342  100403                        BMI     8$              ;IF SO, GO GET A FINAL CHECK
(2)  012344  005300                        DEC     R0              ;REDUCE COUNT. TIME UP?
(2)  012346  001374                        BNE     7$              ;IF NOT, KEEP WAITING
(2)  012350  000463                        BR      3$              ;ASSUME IT'S NOT A DZ11
(2)  012352  032761  000200  000004  8$:   BIT     #BIT7,4(R1)     ;IS LINE 7 ENABLE STILL SET? IT SHOULD BE
(2)  012360  001457                        BEQ     3$              ;IF IT'S NOT, ASSUME IT'S NOT A DZ11
(2)  012362  032711  000040                BIT     #BIT5,(R1)      ;IS MASTER SCAN ENABLE STILL SET?
(2)  012366  001454                        BEQ     3$              ;IF NOT, ASSUME IT'S NOT A DZ11
(2)  012370  005000                        CLR     R0
(2)  012372  052711  000020                BIS     #20,(R1)        ;SET DEVICE CLEAR
(2)  012376  032711  000020                BIT     #20,(R1)        ;SHOULD STAY SET FOR A WHILE IF DZ
(2)  012402  001446                        BEQ     3$              ;BR IF NOT DZ11
(2)  012404  032711  000020                BIT     #20,(R1)        ;WAIT FOR BIT TO CLEAR
(2)  012410  001404                        BEQ     .+12            ;BR WHEN CLEARED
(2)  012412  104414                        DELAY
(2)  012414  005200                        INC     R0
(2)  012416  001372                        BNE     .-12
(2)  012420  000437                        BR      3$              ;BIT NOT CLEARED! MUST NOT BE DZ11
(2)  012422  005011                        CLR     (R1)            ;GET RID OF MASTER SCAN ENABLE
(2)  012424  005061  000004                CLR     4(R1)           ;GET RID OF LINE 7 ENABLE
(2)                              ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DZ11 CSR ADDRESS.
(2)  012430  010122                        MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
(2)  012432  005722                        TST     (R2)+           ;POP OVER VECTOR STORE AREA
(2)  012434  012722  000005                MOV     #5,(R2)+        ;SET THE DEFAULT BUS LEVEL
(2)  012440  052761  177400  000004        BIS     #177400,4(R1)   ;TRY TO SET ALL DTR BITS
(2)  012446  032761  177400  000004        BIT     #177400,4(R1)   ;IF ANY SET ASSUME EIA BOARD
(2)  012454  001003                        BNE     9$              ;IF NONE SET ASSUME BOARD IS
(2)  012456  052762  100000  177776        BIS     #BIT15,-2(R2)   ;20 MA, SET 20 MA FLAG
(2)  012464  012722  000377          9$:   MOV     #377,(R2)+      ;SET THE DEFAULT LINE SELECTION PARAMETER
(2)  012470  012712  017070                MOV     #17070,(R2)     ;SET THE DEFAULT PARAMETERS
(2)  012474  012223                        MOV     (R2)+,(R3)+     ;COPY PARAMETERS INTO ETABLE DESCRIPTOR
(2)  012476  005022                        CLR     (R2)+           ;SET THE DEFAULT MODE OF OPERATION
(2)  012500  012712  177777                MOV     #-1,(R2)        ;TERMINATE LIST
(2)  012504  105237  001410                INCB    DZNUM           ;UPDATE DEVICE COUNTER
(2)  012510  122737  000020  001410        CMPB    #20,DZNUM       ;ARE MAX. NO. OF DEV FOUND?
(2)  012516  001405                        BEQ     100$            ;YES DON'T LOOK FOR ANY MORE.
(2)  012520  062701  000010          3$:   ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
(2)  012524  022701  163700                CMP     #163700,R1
(2)  012530  001275                        BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
(2)  012532                          100$:
(2)  012532  105737  001410                TSTB    DZNUM           ;WERE ANY DZ11'S FOUND AT ALL?
(2)  012536  001432                        BEQ     5$              ;ERROR AUTO SIZER FOUND NO DZ11'S IN THIS SYS.
(2)  012540  113701  001410                MOVB    DZNUM,R1
(2)  012544  110137  001411                MOVB    R1,SAVNUM       ;SAVE NUMBER OF DEVICES
(2)  012550  012737  000001  001404        MOV     #1,DZACTV
(2)  012556  005301                  4$:   DEC     R1
(2)  012560  001404                        BEQ     98$
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(2)  012562  000261                          SEC
(2)  012564  006137  001404                  ROL     DZACTV
(2)  012570  000772                          BR      4$
(2)  012572  013737  001500  001310  98$:    MOV     DZCRO,$BASE     ;POINT TO THE ADDRESS OF FIRST DEVICE
(2)  012600  013737  001512  001314          MOV     MANTO,$CDW1     ;INDICATE TO ETABLE WHAT MODE IS BEING USED
(2)  012606  012737  000006  000004  99$:    MOV     #6,@#4          ;RESTORE TRAP VECTOR
(2)  012614  013737  001404  001312          MOV     DZACTV,$DEVM    ;SAVE ACTIVE REGISTER
(2)  012622  000410                          BR      VECMAP          ;GO FIND THE VECTOR NOW.
(2)  012624  104402  010564          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DZ11'S FOUND.
(2)  012630  005000                          CLR     R0              ;MAKE DATA DISPLAY ZERO
(2)  012632  000000                          HALT                    ;STOP THE SHOW
(2)  012634  000776                          BR      .-2             ;DISABLE CONT. SW.
(2)  012636  012716  012520          6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTENT TIME-OUT
(2)  012642  000002                          RTI                     ;RETURN TO MAINSTREAM
(2)
(2)  012644  012737  000340  000022  VECMAP: MOV     #340,@#22       ;SET IOT TRAP PRIORITY TO 7
(2)  012652  012737  012770  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
(2)  012660  012702  001500                  MOV     #DZ.MAP,R2      ;SET SOFTWARE POINTER
(2)  012664  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
(2)  012670  012701  000302                  MOV     #302,R1         ;PC OF IOT INSTR.
(2)  012674  010120                  1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
(2)  012676  012721  000004                  MOV     #4,(R1)+        ;WITH .+2; IOT
(2)  012702  022021                          CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
(2)  012704  020127  001000                  CMP     R1,#1000        ;HAS THE VECTOR AREA BEEN EXCEEDED?
(2)  012710  101771                          BLOS    1$              ;BR IF MORE TO FILL
(2)  012712  013704  001404                  MOV     DZACTV,R4       ;STORE TEMPORARILY
(2)  012716  000241                  2$:     CLC
(2)  012720  006004                          ROR     R4              ;BRING OUT A BIT
(2)  012722  103036                          BCC     5$              ;BR IF ALL DONE
(2)  012724  106427  000000                  MTPS    #0              ;ZERO CPU PRIO
(2)  012730  012772  040040  000000          MOV     #BIT14+BIT5,@(R2)
(2)  012736  011201                          MOV     (R2),R1         ;GET CSR
(2)  012740  112761  000200  000004          MOVB    #BIT7,4(R1)     ;SET THE TCR BIT!
(2)                                                                  ;ATTEMPT TO FORCE AN INTERRUPT
(2)  012746  005200                          INC     R0              ;STALL
(2)  012750  001376                          BNE     .-2             ;       FOR TIME TO INTERRUPT
(2)  012752  012762  000300  000002          MOV     #300,2(R2)      ;NO INTERRUPT ASSUME 300 AND FIX DZ11 LATER
(2)  012760  000005                  3$:     RESET                   ;INIT
(2)  012762  062702  000014                  ADD     #14,R2          ;POP SOFTWARE POINTER
(2)  012766  000753                          BR      2$              ;KEEP GOING
(2)  012770  011662  000002          4$:     MOV     (SP),2(R2)      ;GET VECTOR ADDRESS
(2)  012774  162762  000010  000002          SUB     #10,2(R2)       ;POINT BACK TO THE CORRECT VECTOR
(2)  013002  042762  000007  000002          BIC     #7,2(R2)        ;CLEAR JUNK
(2)  013010  022626                          POP2SP                  ;POP IOT JUNK OFF STACK
(2)  013012  012716  012760                  MOV     #3$,(SP)        ;SET FOR RETURN
(2)  013016  000002                          RTI
(2)  013020  013737  001502  001304  5$:     MOV     DZVC0,$VECT1    ;COPY VECTOR OF FIRST DEVICE INTO ETABLE
(2)  013026  012737  005122  000020          MOV     @.SCOPE,IOTVEC  ;RESTORE THE SCOPE TRAP
(2)  013034  000207                          RTS     PC              ;ALL DONE WITH 'AUTO SIZING"
(2)
(2)                                  ; -- END O MACRO ******************
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 8648
 8649                                                   ; -$UNIBUS-*************************
  (2)                                                   ; -$XZ-*****************************
  (3)                                ;********************** TEST 1 ************************
  (1)                                ;*THIS TEST PROVES THE SLAVE SYNC RESPONSE
  (1)                                ;*DURING A READ OR WRITE TO THE FOLLOWING ADDRESS:
  (1)                                ;*      DZCSR, DZRBUF, DZTCR, DZMSR
  (2)                                                   ; -$XZ-*****************************
  (3)                           ;:*  TEST 1
  (6)                           ;;*********************************************************************
  (5)  013036  000004           TST1:   SCOPE
  (3)  013040  012737  000001  001122           MOV     #1,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
  (3)                           ; -- END 0 MACRO ******************
  (3)  013046  012737  013226  001360           MOV     #TST2,NEXT      ;POINT TO THE START OF THE NEXT TEST
  (1)  013054  012737  013214  000004           MOV     #5$,4           ;SET TRAP VECTOR
  (1)  013062  012737  000340  000006           MOV     #PR7,6          ;SET PRIORITY TO LEVEL 7
  (1)  013070  012737  013076  001362           MOV     #1$,LOCK        ;SET RETURN IF SW09=11
  (1)  013076  013700  002042          1$:      MOV     DZCSR,R0        ;SET ADDRESS TO TEST
  (1)  013102  011001                           MOV     (R0),R1         ;READ THE ADDRESS
  (1)  013104  000240                           NOP                     ;WASTE TIME
  (1)  013106  005010                           CLR     (R0)            ;WRITE THE ADDRESS
  (1)  013110  000240                           NOP                     ;WASTE TIME
  (1)  013112  012737  013120  001362           MOV     #2$,LOCK        ;SET RETURN ADDRESS FOR SW09
  (1)  013120  013700  002046          2$:      MOV     DZRBUF,R0       ;SET ADDRESS TO TEST
  (1)  013124  011001                           MOV     (R0),R1         ;READ THE ADDRESS
  (1)  013126  000240                           NOP                     ;
  (1)  013130  005010                           CLR     (R0)            ;WRITE THE ADDRESS
  (1)  013132  000240                           NOP                     ;WASTE TIME
  (1)  013134  012737  013142  001362           MOV     #3$,LOCK        ;SET RETURN ADDRESS FOR SW09
  (1)  013142  013700  002056          3$:      MOV     DZTCR,R0        ;SET ADDRESS TO TEST
  (1)  013146  011001                           MOV     (R0),R1         ;READ THE ADDRESS
  (1)  013150  000240                           NOP
  (1)  013152  005010                           CLR     (R0)            ;WRITE THE ADDRESS
  (1)  013154  000240                           NOP
  (1)  013156  012737  013164  001362           MOV     #4$,LOCK        ;SET RETURN ADDRESS
  (1)  013164  013700  002062          4$:      MOV     DZMSR,R0        ;SET ADDRESS TO TEST
  (1)  013170  011001                           MOV     (R0),R1         ;READ FROM ADDRESS
  (1)  013172  000240                           NOP
  (1)  013174  005010                           CLR     (R0)            ;WRITE THE ADDRESS
  (1)  013176  000240                           NOP                     ;
  (1)  013200  012737  000006  000004           MOV     #6,4            ;SET TRAP CATCHER BACK TO NORMAL
  (1)  013206  005037  000006                   CLR     6               ;
  (1)  013212  104400                           ADVANCE                 ;SCOPE THIS TEST
  (1)  013214  011601                  5$:      MOV     (SP),R1         ;SAVE PC OF TRAP
  (1)  013216  022626                           CMP     (SP)+,(SP)+     ;POP TRAP OFF STACK
  (1)  013220  104001                           ERROR   1               ;*NO SLAVE SYNC RESPONSE.
  (1)  013222  104401                           SCOP1                   ;SW09=1?
  (1)  013224  000111                           JMP     (R1)            ;RTI
  (1)                           ; -- END 0 MACRO ******************
 8650                                                   ; -$XZ-*****************************
  (2)                                ;********************** TEST 2 ************************
 8651                                ;*THIS TEST PROVES THAT BIT "DCLR"
 8652                                ;*CAN BE SET AND THAT IT WILL CLEAR
 8653                                ;*BY ITSELF AFTER A PERIOD OF TIME.
 8654                                                   ; -$XZ-*****************************
 8655                           ;:*  TEST 2
```

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 (5)                                ;;*****************************************************************
 (4)  013226  000004                TST2:   SCOPE
 (2)  013230  012737  000002  001122        MOV     #2,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
 (2)                                ; -- END 0 MACRO ******************
 (2)  013236  012737  013312  001360        MOV     #TST3,NEXT      ;POINT TO THE START OF THE NEXT TEST
8656  013244  013700  002042                MOV     DZCSR,R0        ;SET POINTER
8657  013250  012705  000020                MOV     #DCLR,R5        ;SET DCLR
8658  013254  010510                        MOV     R5,(R0)         ;WRITE DCLR INTO DZCSR
8659  013256  011004                        MOV     (R0),R4         ;READ BACK DZCSR
8660  013260  020504                        CMP     R5,R4           ;DZCSR OK?
8661  013262  001401                        BEQ     1$              ;IF IT IS SET SKIP THE ERROR CALL
8662  013264  104002                        ERROR   2               ;*DCLR SHOULD BE SET..MOMENTARILY
8663                                    ;NOW LETS WATCH IT DISAPPEAR
8664  013266  005002                1$:     CLR     R2              ;SET COUNTER TO 0
8665  013270  005005                        CLR     R5              ;SET EXPECTED TO 0
8666  013272  005003                        CLR     R3              ;DUAL LOOP COUNTER
8667  013274  011004                2$:     MOV     (R0),R4         ;IS DCLR CLEAR?
8668  013276  001405                        BEQ     3$              ;IF YES , GO TO THE NEXT TEST
8669  013300  005203                        INC     R3              ;IF NO,COUNT 1 OF 65535 TICKS
8670                                                                ;THE WORD CREATED BY THE IMMEDIATE 0 WILL BE
8671                                                                ;THE COUNTER
8672  013302  001374                        BNE     2$              ;HAS THE TIME EXPIRED? IF NO, GO TEST BIT AGAIN
8673  013304  005302                        DEC     R2              ;HAS THE TOTAL TIME EXPIRED?
8674  013306  001372                        BNE     2$              ;IF NO, CHECK THE BIT AGAIN
8675  013310  104002                        ERROR   2               ;*DCLR FAILED TO CLEAR
8676  013312                         3$:
8680                                                                ; -$MRRW----------------------------------
 (3)                                                                ; -$XZ------------------------------
 (4)                                    ;********************** TEST 3 *********************************
 (2)                                    ;*TEST TO VERIFY THAT BIT "MAINT" CAN
 (2)                                    ;*BE SET. THEN VERIFY THAT BIT "MAINT" CAN
 (2)                                    ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
 (2)                                    ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
 (2)                                    ;*CLEARED BY A "DEVICE CLEAR"
 (3)                                                                ; -$XZ------------------------------
 (4)                                ;:*  TEST 3
 (7)                                ;;*****************************************************************
 (6)  013312  000004                TST3:   SCOPE
 (4)  013314  012737  000003  001122        MOV     #3,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
 (4)                                ; -- END 0 MACRO ******************
 (4)  013322  012737  013404  001360        MOV     #TST4,NEXT      ;POINT TO THE START OF THE NEXT TEST
 (2)  013330  013700  002042                MOV     DZCSR,R0        ;GET BASE ADDRESS
 (2)  013334  012705  000010                MOV     #MAINT,R5       ;SET BIT
 (2)  013340  010510                        MOV     R5,(R0)         ;SET SET IN DEVICE
 (2)  013342  011004                        MOV     (R0),R4         ;READ THE BIT FROM DEVICE
 (2)  013344  020504                        CMP     R5,R4           ;WAS BIT SET?
 (2)  013346  001401                        BEQ     1$              ;BR IF YES
 (2)  013350  104002                        ERROR   2               ;*BIT R/W FAILURE
 (2)  013352  040510                1$:     BIC     R5,(R0)         ;CLEAR THE BIT.
 (2)  013354  011004                        MOV     (R0),R4         ;READ DEVICE
 (2)  013356  001404                        BEQ     2$              ;BR IF BITS WERE CLEARED.
 (2)  013360  010546                        MOV     R5,-(SP)        ;SAVE THE BIT
 (2)  013362  005005                        CLR     R5              ;SET EXPECTED RESULTS TO 0
 (2)  013364  104002                        ERROR   2               ;*BIT FAILED TO CLEAR
 (2)  013366  012605                        MOV     (SP)+,R5        ;RESTORE THE BIT.
 (2)  013370  010510                2$:     MOV     R5,(R0)         ;SET THE BIT AGAIN
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(2)  013372  104413                    DEVICE.CLR              ;ISSUE DEVICE CLEAR
(2)  013374  011004                    MOV     (R0),R4         ;READ THE BIT.
(2)  013376  001402                    BEQ     3$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
(2)  013400  005005                    CLR     R5              ;SET EXPECTED TO ZERO
(2)  013402  104002                    ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAP
(2)  013404                        3$:
(2)                                ;  - END 0 MACRO ******************
(1)                                ;  - END 0 MACRO ******************
(2)                                                            ; -$MRRW-**********************************
(3)                                                            ; -$XZ-*****************************
(4)                                    ;************************ TEST 4 ********************************
(2)                                    ;*TEST TO VERIFY THAT BIT "MSENAB" CAN
(2)                                    ;*BE SET. THEN VERIFY THAT BIT "MSENAB" CAN
(2)                                    ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
(2)                                    ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
(2)                                    ;*CLEARED BY A "DEVICE CLEAR"
(3)                                                            ; -$XZ *************************
(4)                                ;:*  TEST 4
(7)                                ;;**************************************************************
(6)  013404  000004                TST4:   SCOPE
(4)  013406  012737  000004  001122        MOV     #4,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
(4)                                ; -- END 0 MACRO ******************
(4)  013414  012737  013476  001360        MOV     #TST5,NEXT      ;POINT TO THE START OF THE NEXT TEST
(2)  013422  013700  002042                MOV     DZCSR,R0        ;GET BASE ADDRESS
(2)  013426  012705  000040                MOV     #MSENAB,R5      ;SET BIT
(2)  013432  010510                        MOV     R5,(R0)         ;SET SET IN DEVICE
(2)  013434  011004                        MOV     (R0),R4         ;READ THE BIT FROM DEVICE
(2)  013436  020504                        CMP     R5,R4           ;WAS BIT SET?
(2)  013440  001401                        BEQ     1$              ;BR IF YES
(2)  013442  104002                        ERROR   2               ;*BIT R/W FAILURE
(2)  013444  040510                1$:     BIC     R5,(R0)         ;CLEAR THE BIT.
(2)  013446  011004                        MOV     (R0),R4         ;READ DEVICE
(2)  013450  001404                        BEQ     2$              ;BR IF BITS WERE CLEARED.
(2)  013452  010546                        MOV     R5,-(SP)        ;SAVE THE BIT
(2)  013454  005005                        CLR     R5              ;SET EXPECTED RESULTS TO 0
(2)  013456  104002                        ERROR   2               ;*BIT FAILED TO CLEAR
(2)  013460  012605                        MOV     (SP)+,R5        ;RESTORE THE BIT.
(2)  013462  010510                2$:     MOV     R5,(R0)         ;SET THE BIT AGAIN
(2)  013464  104413                        DEVICE.CLR              ;ISSUE DEVICE CLEAR
(2)  013466  011004                        MOV     (R0),R4         ;READ THE BIT.
(2)  013470  001402                        BEQ     3$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
(2)  013472  005005                        CLR     R5              ;SET EXPECTED TO ZERO
(2)  013474  104002                        ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAR
(2)  013476                        3$:
(2)                                ; -- END 0 MACRO ******************
(1)                                ; -- END 0 MACRO ******************
(2)                                                            ; -$MRRW-**********************************
(3)                                                            ; -$XZ-*****************************
(4)                                    ;************************ TEST 5 ********************************
(2)                                    ;*TEST TO VERIFY THAT BIT "SILOEN" CAN
(2)                                    ;*BE SET. THEN VERIFY THAT BIT "SILOEN" CAN
(2)                                    ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
(2)                                    ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
(2)                                    ;*CLEARED BY A "DEVICE CLEAR'
(3)                                                            ; -$XZ *************************-*********
(4)                                ;:*  TEST 5
```

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(7)
(6)  013476  000004                        ;;**********************************************************************
(6)  013500  012737  000005  001122  TST5:  SCOPE
(4)                                         MOV     #5,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
(4)                                 ;    END 0 MACRO ******************
(4)  013506  012737  013570  001360         MOV     #TST6,NEXT      ;POINT TO THE START OF THE NEXT TEST
(2)  013514  013700  002042                 MOV     DZCSR,R0        ;GET BASE ADDRESS
(2)  013520  012705  010000                 MOV     #SILOEN,R5      ;SET BIT
(2)  013524  010510                         MOV     R5,(R0)         ;SET SET IN DEVICE
(2)  013526  011004                         MOV     (R0),R4         ;READ THE BIT FROM DEVICE
(2)  013530  020504                         CMP     R5,R4           ;WAS BIT SET?
(2)  013532  001401                         BEQ     1$              ;BR IF YES
(2)  013534  104002                         ERROR   2               ;*BIT R/W FAILURE
(2)  013536  040510                 1$:     BIC     R5,(R0)         ;CLEAR THE BIT.
(2)  013540  011004                         MOV     (R0),R4         ;READ DEVICE
(2)  013542  001404                         BEQ     2$              ;BR IF BITS WERE CLEARED.
(2)  013544  010546                         MOV     R5,-(SP)        ;SAVE THE BIT
(2)  013546  005005                         CLR     R5              ;SET EXPECTED RESULTS TO 0
(2)  013550  104002                         ERROR   2               ;*BIT FAILED TO CLEAR
(2)  013552  012605                         MOV     (SP)+,R5        ;RESTORE THE BIT.
(2)  013554  010510                 2$:     MOV     R5,(R0)         ;SET THE BIT AGAIN
(2)  013556  104413                         DEVICE.CLR              ;ISSUE DEVICE CLEAR
(2)  013560  011004                         MOV     (R0),R4         ;READ THE BIT.
(2)  013562  001402                         BEQ     3$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
(2)  013564  005005                         CLR     R5              ;SET EXPECTED TO ZERO
(2)  013566  104002                         ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAR
(2)  013570                         3$:
(2)                                 ; -- END 0 MACRO ******************
(1)                                 ; -- END 0 MACRO ************ *****
(2)                                                 ;  $MRRW-***********************************
(3)                                                 ; -$XZ-*****************************
(4)                                 ;************************ TEST 6 *******************************
(2)                                 ;*TEST TO VERIFY THAT BIT "RIE" CAN
(2)                                 ;*BE SET. THEN VERIFY THAT BIT "RIE" CAN
(2)                                 ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
(2)                                 ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
(2)                                 ;*CLEARED BY A 'DEVICE CLEAR"
(3)                                                 ; -$XZ-*****************************
(4)                                 ;:*  TEST 6
(7)                                 ;;**********************************************************************
(6)  013570  000004                 TST6:   SCOPE
(4)  013572  012737  000006  001122         MOV     #6,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
(4)                                 ; -- END 0 MACRO ******************
(4)  013600  012737  013662  001360         MOV     #TST7,NEXT      ;POINT TO THE START OF THE NEXT TEST
(2)  013606  013700  002042                 MOV     DZCSR,R0        ;GET BASE ADDRESS
(2)  013612  012705  000100                 MOV     #RIE,R5 ;SET BIT
(2)  013616  010510                         MOV     R5,(R0)         ;SET SET IN DEVICE
(2)  013620  011004                         MOV     (R0),R4         ;READ THE BIT FROM DEVICE
(2)  013622  020504                         CMP     R5,R4           ;WAS BIT SET?
(2)  013624  001401                         BEQ     1$              ;BR IF YES
(2)  013626  104002                         ERROR   2               ;*BIT R/W FAILURE
(2)  013630  040510                 1$:     BIC     R5,(R0)         ;CLEAR THE BIT.
(2)  013632  011004                         MOV     (R0),R4         ;READ DEVICE
(2)  013634  001404                         BEQ     2$              ;BR IF BITS WERE CLEARED.
(2)  013636  010546                         MOV     R5,-(SP)        ;SAVE THE BIT
(2)  013640  005005                         CLR     R5              ;SET EXPECTED RESULTS TO 0
(2)  013642  104002                         ERROR   2               ;*BIT FAILED TO CLEAR
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(2)  013644  012605                        MOV     (SP)+,R5        ;RESTORE THE BIT.
(2)  013646  010510                2$:     MOV     R5,(R0)         ;SET THE BIT AGAIN
(2)  013650  104413                        DEVICE.CLR              ;ISSUE DEVICE CLEAR
(2)  013652  011004                        MOV     (R0),R4         ;READ THE BIT.
(2)  013654  001402                        BEQ     3$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
(2)  013656  005005                        CLR     R5              ;SET EXPECTED TO ZERO
(2)  013660  104002                        ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAR
(2)  013662                        3$:
(2)                                ; -- END 0 MACRO ******************
(1)                                ; -- END 0 MACRO ******************
(2)                                                        ;  $MRRW-**********************************
(3)                                                        ; -$XZ-****************************
(4)                                    ;************************ TEST 7 ********************************
(2)                                    ;*TEST TO VERIFY THAT BIT "TIE" CAN
(2)                                    ;*BE SET. THEN VERIFY THAT BIT "TIE" CAN
(2)                                    ;*BE CLEARED (WRITTEN TO A ZERO). AND FINALLY
(2)                                    ;*VERIFY THAT AFTER BEING SET AGAIN IT CAN BE
(2)                                    ;*CLEARED BY A "DEVICE CLEAR"
(3)                                                        ; -$XZ-****************************
(4)                                ;:*  TEST 7
(7)                                ;;*********************************************************************
(6)  013662  000004                TST7:   SCOPE
(4)  013664  012737  000007  001122        MOV     #7,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
(4)                                ; -- END 0 MACRO ******************
(4)  013672  012737  013754  001360        MOV     #TST10,NEXT     ;POINT TO THE START OF THE NEXT TEST
(2)  013700  013700  002042                MOV     DZCSR,R0        ;GET BASE ADDRESS
(2)  013704  012705  040000                MOV     #TIE,R5 ;SET BIT
(2)  013710  010510                        MOV     R5,(R0)         ;SET SET IN DEVICE
(2)  013712  011004                        MOV     (R0),R4         ;READ THE BIT FROM DEVICE
(2)  013714  020504                        CMP     R5,R4           ;WAS BIT SET?
(2)  013716  001401                        BEQ     1$              ;BR IF YES
(2)  013720  104002                        ERROR   2               ;*BIT R/W FAILURE
(2)  013722  040510                1$:     BIC     R5,(R0)         ;CLEAR THE BIT.
(2)  013724  011004                        MOV     (R0),R4         ;READ DEVICE
(2)  013726  001404                        BEQ     2$              ;BR IF BITS WERE CLEARED.
(2)  013730  010546                        MOV     R5, (SP)        ;SAVE THE BIT
(2)  013732  005005                        CLR     R5              ;SET EXPECTED RESULTS TO 0
(2)  013734  104002                        ERROR   2               ;*BIT FAILED TO CLEAR
(2)  013736  012605                        MOV     (SP)+,R5        ;RESTORE THE BIT.
(2)  013740  010510                2$:     MOV     R5,(R0)         ;SET THE BIT AGAIN
(2)  013742  104413                        DEVICE.CLR              ;ISSUE DEVICE CLEAR
(2)  013744  011004                        MOV     (R0),R4         ;READ THE BIT.
(2)  013746  001402                        BEQ     3$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
(2)  013750  005005                        CLR     R5              ;SET EXPECTED TO ZERO
(2)  013752  104002                        ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAR
(2)  013754                        3$:
(2)                                ; -- END 0 MACRO ******************
(1)                                ; -- END 0 MACRO ******************
8681                                                       ;  $TCR-*****************************************
(2)                                                        ;  $XZ-*******-*****-*****************
(3)                                    ;************************ TEST 10 *******************************
(1)                                    ;*THIS TESTS THAT ALL OF THE FOLLOWING
(1)                                    ;*BITS CAN BE: SET, CLEARED, CLEARED BY "DEVICE CLEAR "
(1)                                    ;*BITS TESTED ARE:
(1)                                    ;* TCR0, TCR1, TCR2, TCR3, TCR4, TCR5, TCR6, TCR7
(2)                                                        ;  $XZ -  *  ---  -*--*-*************
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(3)                                     ;:*  TEST 10
(6)                                     ;;*****************************************************************
(5)  013754  000004                     TST10:  SCOPE
(3)  013756  012737  000010  001122             MOV     #10,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)                                     ; -- END 0 MACRO ******************
(3)  013764  012737  014112  001360             MOV     #TST11,NEXT     ;POINT TO THE START OF THE NEXT TEST
(1)  013772  013700  002056                     MOV     DZTCR,R0        ;SET DEVICE ADDRESS
(1)  013776  012705  000001                     MOV     #TCR0,R5        ;SET EXPECTED RESULTS
(1)  014002  012737  014010  001362             MOV     #1$,LOCK        ;SET FOR SW09
(1)  014010  010510                     1$:     MOV     R5,(R0)         ;SET THE BIT
(1)  014012  011004                             MOV     (R0),R4         ;READ THE BIT FROM THE DEVICE
(1)  014014  042704  177400                     BIC     #^C<377>,R4     ;CLEAR HIGH BYTE
(1)  014020  020504                             CMP     R5,R4           ;WAS BIT OK?
(1)  014022  001401                             BEQ     2$              ;BR IF YES
(1)  014024  104002                             ERROR   2               ;*BIT FAILED TO SET.
(1)  014026  040510                     2$:     BIC     R5,(R0)         ;CLEAR THE BIT
(1)  014030  011004                             MOV     (R0),R4         ;READ THE REGISTER
(1)  014032  042704  177400                     BIC     #^C<377>,R4     ;CLEAR HIGH BYTE
(1)  014036  005704                             TST     R4              ;BITS CLEAR?
(1)  014040  001404                             BEQ     3$              ;BR IF YES
(1)  014042  010546                             MOV     R5,-(SP)        ;SAVE GOOD RESULTS
(1)  014044  005005                             CLR     R5              ;SET EXPECTED TO 0
(1)  014046  104002                             ERROR   2               ;*REPORT BIT NOT CLEAR
(1)  014050  012605                             MOV     (SP)+,R5        ;RESTORE R5
(1)  014052  010510                     3$:     MOV     R5,(R0)         ;SET THE BIT AGAIN.
(1)  014054  104413                             DEVICE.CLR              ;ISSUE DEVICE CLEAR
(1)  014056  011004                             MOV     (R0),R4         ;READ THE REGISTER
(1)  014060  042704  177400                     BIC     #^C<377>,R4     ;CLEAR HIGH BYTE
(1)  014064  005704                             TST     R4              ;BITS CLEAR?
(1)  014066  001404                             BEQ     4$              ;BR IF YES
(1)  014070  010546                             MOV     R5, (SP)        ;SAVE GOOD RESULTS
(1)  014072  005005                             CLR     R5              ;SET EXPECTED TO 0
(1)  014074  104002                             ERROR   2               ;*REPORT BIT NOT CLEAR
(1)  014076  012605                             MOV     (SP)+,R5        ;RESTORE R5
(1)  014100  104401                     4$:     SCOP1                   ;LOCK ON BIT? SET SW09=1
(1)  014102  106305                             ASLB    R5              ;CHANGE TO NEXT BIT
(1)  014104  001341                             BNE     1$              ;CONTINUE TESTING
(1)  014106  005037  001362                     CLR     LOCK            ;MAKE SURE TIGHT LOOP IS CLEANED UP
(1)                                     ; -- END 0 MACRO ******************
8682                                            ; -$TCR-=========================================-=-=======
(2)                                             ; -$XZ-=============================
(3)                                     ;************************ TEST 11 *******************************
(1)                                     ;*THIS TESTS THAT ALL OF THE FOLLOWING
(1)                                     ;*BITS CAN BE: SET, CLEARED, CLEARED BY "RESET INSTR *NOT* DEVICE CLEAR "
(1)                                     ;*BITS TESTED ARE:
(1)                                     ;* DTR0, DTR1, DTR2, DTR3, DTR4, DTR5, DTR6, DTR7
(1)                                     ;*THIS TEST IS NOT DONE IF MODULE IS 20MA VERSION
(2)                                             ;  $XZ-=-=-=========================
(3)                                     ;:*  TEST 11
(6)                                     ;;*****************************************************************
(5)  014112  000004                     TST11:  SCOPE
(3)  014114  012737  000011  001122             MOV     #11,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)                                     ;    END 0 MACRO ******************-=
(3)  014122  012737  014274  001360             MOV     #TST12,NEXT     ;POINT TO THE START OF THE NEXT TEST
(1)  014130  013700  002056                     MOV     DZTCR,R0        ;SET DEVICE ADDRESS
(1)  014134  012705  000400                     MOV     #DTR0,R5        ;SET EXPECTED RESULTS
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(1)  014140  012737  014156  001362          MOV     #1$,LOCK        ;SET FOR SW09
(1)  014146  105737  001414                  TSTB    EIAFLG          ;20MA OR EIA
(1)  014152  100001                          BPL     1$              ;BR IF EIA
(1)  014154  104400                          ADVANCE                 ;EXIT TEST
(1)  014156  010510                  1$:     MOV     R5,(R0)         ;SET THE BIT
(1)  014160  011004                          MOV     (R0),R4         ;READ THE BIT FROM THE DEVICE
(1)  014162  105004                          CLRB    R4              ;CLEAR LOW BYTE
(1)  014164  020504                          CMP     R5,R4           ;WAS BIT OK?
(1)  014166  001401                          BEQ     2$              ;BR IF YES
(1)  014170  104002                          ERROR   2               ;*BIT FAILED TO SET.
(1)  014172  040510                  2$:     BIC     R5,(R0)         ;CLEAR THE BIT
(1)  014174  011004                          MOV     (R0),R4         ;READ THE REGISTER
(1)  014176  105004                          CLRB    R4              ;CLEAR LOW BYTE
(1)  014200  005704                          TST     R4              ;BITS CLEAR?
(1)  014202  001404                          BEQ     3$              ;BR IF YES
(1)  014204  010546                          MOV     R5,-(SP)        ;SAVE GOOD RESULTS
(1)  014206  005005                          CLR     R5              ;SET EXPECTED TO 0
(1)  014210  104002                          ERROR   2               ;*REPORT BIT NOT CLEAR
(1)  014212  012605                          MOV     (SP)+,R5        ;RESTORE R5
(1)  014214  010510                  3$:     MOV     R5,(R0)         ;SET THE BIT AGAIN.
(1)  014216  104413                          DEVICE.CLR              ;ISSUE DEVICE CLEAR
(1)  014220  011004                          MOV     (R0),R4         ;READ THE REGISTER
(1)  014222  105004                          CLRB    R4              ;CLEAR LOW BYTE
(1)  014224  030510                          BIT     R5,(R0)         ;WAS BIT CLEARED BY DEVICE.CLR?
(1)  014226  001001                          BNE     4$              ;BR IF NO (IT SHOULDN'T BE CLEAR)
(1)  014230  104002                          ERROR   2               ;*BIT CLEARED BY DEVICE.CLR
(1)  014232  104401                  4$:     SCOP1                   ;LOCK ON BIT? SW09=1
(1)  014234  006305                          ASL     R5              ;CHANGE TO NEXT BIT
(1)  014236  001347                          BNE     1$              ;IF NOT DONE LOOP
(1)  014240  012710  177400                  MOV     #177400,(R0)    ;SET ALL DTR BITS
(1)  014244  005005                          CLR     R5              ;CLEAR LOCATION FOR ERROR PRINTOUT
(1)  014246  005227  000000          5$:     INC     #0              ;ACT DELAY LOOP FOR
(1)  014252  001375                          BNE     5$              ;RESET INSTRUCTION
(1)  014254  000005                          RESET                   ;ISSUE A BUS INIT
(1)  014256  011004                          MOV     (R0),R4         ;READ REGISTER
(1)  014260  105004                          CLRB    R4              ;CLEAR LOW BYTE
(1)  014262  005704                          TST     R4              ;DTR BITS CLEAR?
(1)  014264  001401                          BEQ     .+4             ;IF YES CONTINUE
(1)  014266  104002                          ERROR   2               ;IF NO PRINT ERROR
(1)  014270  005037  001362                  CLR     LOCK            ;MAKE SURE TIGHT LOOP IS CLEANED UP
(1)                              ; -- END 0 MACRO ==========
8683                                         ; $MRR-==========
(2)                                          ;  $XZ-==========
(3)                              ;************************ TEST 12 ********************************
(1)                              ;*THIS TEST PERFORMS RESET TESTING &
(1)                              ;*TESTING OF WRITE ONLY OR READ ONLY BIT
(1)                              ;* TEST BITS "RDONE, BIT11, BIT10, BIT9, BIT8, BIT2, BIT1
(1)                              ;*            BIT0, SILOAL' ARE READ ONLY AND THAT TRDY IS
(1)                              ;*            ZERO UNTIL A LINE IS SELECTED AND MSENAB IS SET.
(1)                              ;*
(2)                                          ; -$XZ-==========
(3)                              ;:*  TEST 12
(6)                              ;;*************************************************************
(5)  014274  000004              TST12:  SCOPE
(3)  014276  012737  000012  001122          MOV     #12,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)                              ;    END 0 MACRO ==========
```

```
   (3)  014304  012737  014412  001360          MOV     #TST13,NEXT     ;POINT TO THE START OF THE NEXT TEST
   (1)  014312  013700  002042                  MOV     DZCSR,R0        ;SET ADDRESS TO R0
   (1)  014316  005005                          CLR     R5              ;SET EXPECTED TO 0
   (1)  014320  012710  027607                  MOV     #RDONE+BIT11+BIT10+BIT9+BIT8+BIT2+BIT1+BIT0+SILOAL,(R0)
   (1)                                                                  ;WRITE THE BITS
   (1)  014324  011004                          MOV     (R0),R4         ;READ BACK THE BITS
   (1)  014326  001401                          BEQ     1$              ;BR IF NONE ARE SET.
   (1)  014330  104002                          ERROR   2               ;*BITS WERE SET.
   (1)  014332  012710  100000          1$:     MOV     #TRDY,(R0)      ;ATTEMPT TO WRITE TRDY
   (1)  014336  011004                          MOV     (R0),R4         ;READ TRDY
   (1)  014340  001401                          BEQ     2$              ;BR IF NOT SET
   (1)  014342  104002                          ERROR   2               ;*
   (1)  014344  012705  100000          2$:     MOV     #TRDY,R5        ;SET EXPECTED BIT
   (1)  014350  005077  165476                  CLR     @DZLPR          ;LOAD LINE 0
   (1)  014354  052777  000001  165474          BIS     #TCR0,@DZTCR    ;SET TCR BIT
   (1)  014362  052710  000040                  BIS     #MSENAB,(R0)    ;
   (1)  014366  052705  000040                  BIS     #MSENAB,R5      ;SET SCAN ENABLE
   (1)  014372  005002                          CLR     R2              ;SET COUNTER TO ZERO
   (1)  014374  011004                  3$:     MOV     (R0),R4         ;READ THE REGISTER
   (1)  014376  020504                          CMP     R5,R4           ;BIT SET?
   (1)  014400  001404                          BEQ     4$              ;BR IF YES
   (1)  014402  104414                          DELAY                   ;STALL TIME
   (1)  014404  005202                          INC     R2              ;UPDATE COUNTER
   (1)  014406  001372                          BNE     3$              ;BR IF COUNTER NOT DONE.
   (1)  014410  104002                          ERROR   2               ;*TRDY NOT SET!
   (1)  014412                          4$:
   (1)                                  ; - END 0 MACRO ==================
  8684                                                                  ; -$XZ-============================
   (2)                                  ;************************ TEST 13 ********************************
  8685                                  ;*THIS TEST PERFORMS RESET TESTING AND
  8686                                  ;*TESTING OF READ ONLY AND WRITE ONLY BITS
  8687                                  ;* IN REGISTER DZCSR
  8688                                  ;*VERIFY THAT "TIE", "SILOEN", "RIE", "MSENAB", "MAINT"
  8689                                  ;*ARE THE ONLY R/W BITS IN THE DZCSR.
  8690                                  ;*THEN VERIFY THAT A RESET WILL CLEAR THESE BITS
  8691                                  ;*THIS TEST ALSO CHECKS BYTE OPERATIONS ON THE CSR
  8692                                                                  ; -$XZ ============================
  8693                                  ;:*  TEST 13
   (5)                                  ;;*****************************************************************
   (4)  014412  000004                  TST13:  SCOPE
   (2)  014414  012737  000013  001122          MOV     #13,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
   (2)                                  ; -- END 0 MACRO ==================
   (2)  014422  012737  014542  001360          MOV     #TST14,NEXT     ;POINT TO THE START OF THE NEXT TEST
  8694  014430  104413                          DEVICE.CLR
  8695  014432  013700  002042                  MOV     DZCSR,R0        ;SET UP FOR ERROR MESSAGE
  8696  014436  012710  177757                  MOV     #^C<DCLR>,(R0)  ;TRY TO WRITE
  8697  014442  012705  050150                  MOV     #TIE!SILOEN!RIE!MSENAB!MAINT,R5 ;MAKE EXPECTED
  8698  014446  011004                          MOV     (R0),R4         ;ACTUAL
  8699  014450  020405                          CMP     R4,R5           ;CMP EXPECTED VS ACTUAL
  8700  014452  001401                          BEQ     1$              ;YES
  8701  014454  104002                          ERROR   2               ;*NO
  8702  014456  105010                  1$:     CLRB    (R0)            ;CLEAR LOWER BYTE OF CSR
  8703  014460  105005                          CLRB    R5              ;SET EXPECTED
  8704  014462  011004                          MOV     (R0),R4         ;READ CSR BITS
  8705  014464  020405                          CMP     R4,R5           ;COMPARE ACTUAL TO EXPECTED
  8706  014466  001401                          BEQ     3$              ;BRANCH IF SAME
```

```
 8707  014470  104002                        ERROR   2               ;OTHERWISE PRINT ERROR
 8708  014472  012710  177757          3$:   MOV     @#C<DCLR>,(R0)  ;RESET CSR BITS
 8709  014476  105077  165342                CLRB    @#HDZCSR        ;CLEAR HIGH BYTE OF CSR
 8710  014502  012705  000150                MOV     #RIE!MSENAB!MAINT,R5
 8711                                                                 ;SET R5 TO EXPECTED RESULTS
 8712  014506  011004                        MOV     (R0),R4         ;READ CSR
 8713  014510  020405                        CMP     R4,R5           ;ACTUAL = EXPECTED?
 8714  014512  001401                        BEQ     4$              ;BRANCH IF SAME
 8715  014514  104002                        ERROR   2               ;OTHERWISE PRINTOUT ERROR
 8716  014516  012710  177757          4$:   MOV     @#C<DCLR>,(R0)  ;RESET CSR BITS
 8717  014522  005005                        CLR     R5              ;SET R5 TO EXPECTED RESULTS
 8718  014524  005227  000000          5$:   INC     #0              ;DELAY TIMER FOR
 8719  014530  001375                        BNE     5$              ;ACT-11 COMPATIBILITY
 8720  014532  000005                        RESET                   ;ISSUE BUS INIT
 8721  014534  011004                        MOV     (R0),R4         ;READ CSR REGISTER
 8722  014536  001401                        BEQ     2$              ;BRANCH IF CSR IS CLEAR
 8723  014540  104002                        ERROR   2               ;IF NOT PRINT ERROR
 8724  014542                          2$:
 8725                                                                 ; -$MRWD-==========================
  (2)                                                                ; -$XZ-============================
  (3)                                    ;************************ TEST 14 ********************************
  (1)                                    ;*THIS TEST PERFORMS RESET TESTING AND
  (1)                                    ;*TESTING OF READ ONLY REGISTER DZRBUF
  (1)                                    ;*AND TESTING OF WRITE ONLY REGISTER DZLPR
  (2)                                                                ; -$XZ-============================
  (3)                                TST14:  SCOPE
  (6)                                ;;****************************************************************
  (5)  014542  000004                        SCOPE
  (3)  014544  C12737  000014  001122        MOV     #14,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (3)                                ; -- END 0 MACRO ******************
  (3)  014552  012737  014632  001360        MOV     #TST15,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  014560  104413                        DEVICE.CLR              ;CLEAR DZ11
  (1)  014562  013700  002046                MOV     DZRBUF,R0               ;SET UP FOR ERROR MESSAGE
  (1)  014566  011005                        MOV     (R0),R5         ;SET EXPECTED
  (1)  014570  012777  177777  165254        MOV     #-1,@DZLPR      ;TRY TO WRITE ALL 1'S
  (1)  014576  011004                        MOV     (R0),R4         ;ACTUAL
  (1)  014600  042705  104000                BIC     #DVALID!BIT11,R5 ;DITTO
  (1)  014604  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
  (1)  014606  001401                        BEQ     1$              ;IF YES,GO CONTINUE PROCESSING
  (1)  014610  104002                        ERROR   2               ;*ERROR- BIT PATTERN NOT CORRECT
  (1)  014612  010403                  1$:   MOV     R4,R3           ;GET A COPY OF THE ACTUAL BIT PATTERN
  (1)  014614  005103                        COM     R3              ;GET THE LOGICAL INVERSE OF THE BIT PATTERN
  (1)  014616  010377  165230                MOV     R3,@DZLPR       ;TRY TO WRITE
  (1)  014622  011004                        MOV     (R0),R4         ;ACTUAL
  (1)  014624  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
  (1)  014626  001401                        BEQ     2$              ;IF YES, GET OUT OF THIS TEST
  (1)  014630  104002                        ERROR   2               ;*NO
  (1)  014632                          2$:
  (1)                                ;  - END 0 MACRO ******************
 8726                                                                 ; -$MRWD-==========================
  (2)                                                                ; -$XZ-============================
  (3)                                    ;************************ TEST 15 ********************************
  (1)                                    ;*THIS TEST PERFORMS RESET TESTING AND
  (1)                                    ;*TESTING OF READ ONLY REGISTER DZMSR
  (1)                                    ;*AND TESTING OF WRITE ONLY REGISTER DZTDR
  (2)                                                                ; -$XZ-============================
```

```
   (3)                                  ;:*  TEST 15
   (6)                                  ;;*****************************************************************
   (5)  014632  000004                  TST15:  SCOPE
   (3)  014634  012737  000015  001122          MOV     #15,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
   (3)                                  ; -- END 0 MACRO ******************
   (3)  014642  012737  014716  001360          MOV     #TST16,NEXT     ;POINT TO THE START OF THE NEXT TEST
   (1)  014650  104413                          DEVICE.CLR              ;CLEAR DZ11
   (1)  014652  013700  002062                  MOV     DZMSR,R0                ;SET UP FOR ERROR MESSAGE
   (1)  014656  011005                          MOV     (R0),R5         ;SET EXPECTED
   (1)  014660  012777  177777  165200          MOV     #-1,@DZTDR      ;TRY TO WRITE ALL 1'S
   (1)  014666  011004                          MOV     (R0),R4         ;ACTUAL
   (1)  014670  020405                          CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
   (1)  014672  001401                          BEQ     1$              ;IF YES,GO CONTINUE PROCESSING
   (1)  014674  104002                          ERROR   2               ;*ERROR- BIT PATTERN NOT CORRECT
   (1)  014676  010403                  1$:     MOV     R4,R3           ;GET A COPY OF THE ACTUAL BIT PATTERN
   (1)  014700  005103                          COM     R3              ;GET THE LOGICAL INVERSE OF THE BIT PATTERN
   (1)  014702  010377  165160                  MOV     R3,@DZTDR       ;TRY TO WRITE
   (1)  014706  011004                          MOV     (R0),R4         ;ACTUAL
   (1)  014710  020405                          CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
   (1)  014712  001401                          BEQ     2$              ;IF YES, GET OUT OF THIS TEST
   (1)  014714  104002                          ERROR   2               ;*NO
   (1)  014716                          2$:
   (1)                                  ; -- END 0 MACRO ******************
  8727
  8728
  8729                                                  ; -$XZ-****************************
   (2)                                  ;*********************\***** TEST 16 *********************************
  8730                                  ;*VERIFY THAT IF WE ARE IN "STAGGERED" MODE
  8731                                  ;*THAT SETTING "DTR" FOR A LINE WILL
  8732                                  ;*BRING UP "RING" AND "CARRIER" FOR THE
  8733                                  ;*ASSOCIATED LINE IN WHICH WE ARE STAGGERED!
  8734                                  ;*  LINE0 DTR= LINE1 RING AND CARRIER
  8735                                  ;*  LINE1 DTR= LINE0 RING AND CARRIER
  8736                                  ;*  LINE2 DTR= LINE3 RING AND CARRIER
  8737                                  ;*  LINE3 DTR= LINE 4 RING AND CARRIER
  8738                                  ;*               ETC...
  8739                                                  ; -$XZ-****************************
  8740
  8741                                  ;:*  TEST 16
   (5)                                  ;;*****************************************************************
   (4)  014716  000004                  TST16:  SCOPE
   (2)  014720  012737  000016  001122          MOV     #16,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
   (2)                                  ; -- END 0 MACRO ******************
   (2)  014726  012737  015112  001360          MOV     #TST17,NEXT     ;POINT TO THE START OF THE NEXT TEST
   (1)  014734  012737  015006  001362          MOV     #1$,LOCK        ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
  8742  014742  105737  001414                  TSTB    EIAFLG          ;EIA OR 20MA?
  8743  014746  100001                          BPL     10$             ;BR IF EIA
  8744  014750  104400                          ADVANCE                 ;EXIT TEST
  8745  014752  013700  002062          10$:    MOV     DZMSR,R0        ;SET REGISTER
  8746  014756  104413                          DEVICE.CLR              ;INIT DZ11
  8747  014760  005003                          CLR     R3              ;ZERO LINE NUMBER
  8748  014762  012702  000001                  MOV     #1,R2           ;SET POINTER
  8749  014766  005737  001370                  TST     MODE            ;ARE WE IN STAGGERED MODE?
  8750  014772  100405                          BMI     1$              ;YES WE ARE!
  8751  014774  013737  001360  001126          MOV     NEXT,$LPADR     ;LEAVE THIS TEST! NOT STAGGERED
  8752  015002  000177  164120                  JMP     @$LPADR         ;EXIT
```

```
 8753  015006  130237  001364          1$:     BITB    R2,LINE         ;TEST THIS LINE?
 8754  015012  001004                          BNE     3$              ;YES
 8755  015014  005203                  2$:     INC     R3              ;LINE #
 8756  015016  106302                          ASLB    R2              ;GET NEXT LINE
 8757  015020  103372                          BCC     1$              ;KEEP TESTING
 8758  015022  104400                          ADVANCE                 ;ADVANCE THIS TEST
 8759  015024  010204                  3$:     MOV     R2,R4           ;SAVE BINARY BIT FOR LINE #
 8760  015026  032703  000001                  BIT     #BIT0,R3        ;GET STAGGERED COMPANION LINE
 8761  015032  001402                          BEQ     4$              ;BR IF LINE EVEN
 8762  015034  006204                          ASR     R4              ;ADJUST LINE
 8763  015036  000401                          BR      5$              ;
 8764  015040  006304                  4$:     ASL     R4              ;ADJUST LINE
 8765  015042  005005                  5$:     CLR     R5              ;SET EXPECTED
 8766  015044  150405                          BISB    R4,R5           ;
 8767  015046  000305                          SWAB    R5              ;
 8768  015050  150405                          BISB    R4,R5           ;
 8769  015052  150277  165002                  BISB    R2,@HDZTCR      ;SET DTR
 8770  015056  104414                          DELAY                   ;CABLE DELAY
 8771  015060  011004                          MOV     (R0),R4         ;READ MSR REGISTER
 8772  015062  020504                          CMP     R5,R4           ;OK?
 8773  015064  001401                          BEQ     6$              ;YES
 8774  015066  104002                          ERROR   2               ;*ERROR IN RING OR CARRIER
 8775  015070  140277  164764          6$:     BICB    R2,@HDZTCR      ;CLEAR DTR
 8776  015074  104414                          DELAY                   ;CABLE DELAY
 8777  015076  011004                          MOV     (R0),R4         ;READ MSR
 8778  015100  001402                          BEQ     7$              ;BR IF THEY CLEARED
 8779  015102  005005                          CLR     R5              ;SET EXPECTED TO 0
 8780  015104  104002                          ERROR   2               ;*BITS NOT CLEARED
 8781  015106  104401                  7$:     SCOP1                   ;LOCK ON SIGNAL?
 8782  015110  000741                          BR      2$              ;CONTINUE TEST
 8783
 8784                                          ; -$XZ-=============================
  (2)                                         ;********************** TEST 17 ******************************
 8785                                         ;*TEST TO VERIFY THAT IF IN "EXTERNAL"
 8786                                         ;*MODE; SETTING DTR FOR SELECTED LINES
 8787                                         ;*WILL BRING UP "CARRIER" AND "RING"
 8788                                         ;*FOR THAT SAME LINE. NOTE: IF YOU HAVE
 8789                                         ;*SELECTED MODE AS "EXTERNAL"; THE H325 TEST CONNECTER
 8790                                         ;*MUST BE USED ON ALL SPECIFIED LINES.
 8791                                         ;*LINES MAY BE SPECIFIED BY SWR03=1
 8792                                         ;*AND SWR00=1 AT START TIME OR ALTERING
 8793                                         ;*STATUS MAP.
 8794                                                 ; -$XZ-=============================
 8795                                 ;:*  TEST 17
  (5)                                 ;;*****************************************************************
  (4)  015112  000004                 TST17:  SCOPE
  (2)  015114  012737  000017  001122         MOV     #17,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                 ; -- END 0 MACRO ================-==
  (2)  015122  012737  015250  001360         MOV     #TST20,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  015130  012737  015164  001362         MOV     #3$,LOCK        ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
 8796  015136  105737  001370                 TSTB    MODE            ;EXTERNAL?
 8797  015142  100401                         BMI     2$              ;BR IF YES
 8798  015144  104400                 1$:     ADVANCE                 ;EXIT TEST
 8799  015146  105737  001414         2$:     TSTB    EIAFLG          ;YOU BETTER BE IN
 8800  015152  100774                         BMI     1$              ;EIA MODE FOR THIS TEST.
 8801  015154  013700  002062                 MOV     DZMSR,R0        ;SET REGISTER
```

```
8802  015160  012702  000001                  MOV     #1,R2           ;SET LINE POINTER
8803  015164  130237  001364          3$:     BITB    R2,LINE         ;LINE SELECTED?
8804  015170  001003                          BNE     5$              ;BR IF YES
8805  015172  106302                  4$:     ASLB    R2              ;NEXT LINE
8806  015174  103373                          BCC     3$              ;CONTINUE TEST
8807  015176  104400                          ADVANCE                 ;ADVANCE THIS TEST
8808  015200  005005                  5$:     CLR     R5              ;SET EXPECTED
8809  015202  150205                          BISB    R2,R5           ;
8810  015204  000305                          SWAB    R5              ;
8811  015206  150205                          BISB    R2,R5           ;
8812  015210  150277  164644                  BISB    R2,@HDZTCR      ;SET DTR
8813  015214  104414                          DELAY                   ;CABLE DELAY
8814  015216  011004                          MOV     (R0),R4         ;READ MSR
8815  015220  020504                          CMP     R5,R4           ;BITS OK?
8816  015222  001401                          BEQ     6$              ;BR IF YES
8817  015224  104002                          ERROR   2               ;CARRIER OR RING ERROR
8818  015226  140277  164626          6$:     BICB    R2,@HDZTCR      ;CLEAR DTR
8819  015232  104414                          DELAY                   ;CABLE DELAY
8820  015234  011004                          MOV     (R0),R4         ;READ MSR
8821  015236  001402                          BEQ     7$              ;BR IF BITS CLEARED
8822  015240  005005                          CLR     R5              ;CLEAR EXPECTED LOC.
8823  015242  104002                          ERROR   2               ;BITS NOT CLEARED.
8824  015244  104401                  7$:     SCOP1                   ;LOCK ON LINE?
8825  015246  000751                          BR      4$              ;CONTINUE TEST
8826
8827
 (2)                                          ; -$TLINE-==================================
 (3)                                          ; -$XZ-================ -==========
 (1)                                  ;************************ TEST 20 ******************************
 (1)                                  ;* THIS TEST VERIFIES THAT TRDY IS SET WHEN A LINE
 (1)                                  ;* IS READY TO BE LOADED, AND THAT THE LINE SPECI-
 (1)                                  ;* FIED IN BITS 8-10 OF DZCSR CORRESPOND
 (2)                                  ;* TO THE LINE SELECTED IN DZTCR
 (3)                                          ; -$XZ-============================
 (6)                                  ;;*  TEST 20
 (5)  015250  000004                  ;;**********************************************************************
 (3)  015252  012737  000020  001122  TST20:  SCOPE
 (3)                                          MOV     #20,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (3)                                  ; -  END 0 MACRO ==================
 (3)  015260  012737  015374  001360          MOV     #TST21,NEXT     ;POINT TO THE START OF THE NEXT TEST
 (1)  015266  104413                          DEVICE.CLR              ;ISSUE A "DEVICE CLEAR" (RESET)
 (1)  015270  013700  002042                  MOV     DZCSR,R0        ;SET POINTER
 (1)  015274  012705  100040                  MOV     #MSENAB!TRDY,R5 ;START THE EXPECTED LINE NUMBER AT 0
 (1)  015300  005037  001372                  CLR     SAVLIN          ;SET UP FOR ERROR PRINTOUTS
 (1)  015304  012702  000001                  MOV     #1,R2           ;USING R2 AS A BIT POINTER, POINT TO LINE 0
 (1)  015310  130237  001364          1$:     BITB    R2,LINE         ;IS THIS LINE SELECTED?
 (1)  015314  001420                          BEQ     5$              ;IF NO, SKIP THE STARTUP
 (1)  015316  050277  164534          2$:     BIS     R2,@DZTCR       ;SET THE GO BIT FOR THIS LINE
 (1)  015322  052710  000040                  BIS     #MSENAB,(R0)    ;START THE SCANNER
 (1)  015326  005004                          CLR     R4              ;SET FOR DELAY
 (1)  015330  032710  100000          3$:     BIT     #TRDY,(R0)      ;TX READY?
 (1)  015334  001004                          BNE     4$              ;BR IF YES
 (1)  015336  104414                          DELAY                   ;DELAY
 (1)  015340  005204                          INC     R4              ;COUNTER
 (1)  015342  001372                          BNE     3$              ;BR IF <>0!
 (1)  015344  104003                          ERROR   3               ;*TX NOT READY!
 (1)  015346  011004                  4$:     MOV     (R0),R4         ;GET THE LINE POINTED TO BY THE SCANNER
```

```
  (1)  015350  020405                        CMP     R4,R5           ;IS THE LINE NUMBER WHAT IT SHOULD BE?
  (1)  015352  001401                        BEQ     5$              ;IF YES,GO WORK ON THE NEXT LINE
  (1)  015354  104002                        ERROR   2               ;*LINE NUMBER DID NOT MATCH TCR BIT
  (1)  015356  062705  000400          5$:   ADD     #400,R5         ;POINT TO THE NEXT EXPECTED LINE
  (1)  015362  104413                        DEVICE.CLR              ;ISSUE A "DEVICE CLEAR" (RESET)
  (1)  015364  005237  001372                INC     SAVLIN          ;ADJUST FOR NEXT LINE
  (1)  015370  106302                        ASLB    R2              ;POINT TO THE NEXT LINE.ARE ALL LINES TESTED?
  (1)  015372  103346                        BCC     1$              ;IF NOT, GO DO THE NEXT LINE
  (1)  015374                          6$:
  (1)                                  ; -- END 0 MACRO ******************
 8828                                                                 ; -$XZ-****************************
  (2)                                         ;************************ TEST 21 ********************************
 8829                                         ;*TEST TO TRANSMIT ONE CHAR AND
 8830                                         ;*RECEIVE ONE CHAR ON ONE LINE
 8831                                         ;*AT A TIME. THE CHAR IS "252" AND
 8832                                         ;*ALL SELECTED LINES WILL BE TURNED ON
 8833                                         ;*ONE AT A TIME. THIS IS THE FIRST TIME ANY
 8834                                         ;*DATA IS CHECKED IN THE RECEIVER.
 8835                                         ;*USING SWITCH NINE WITH THIS TEST CREATES A TIGHT SCOPE LOOP
 8836                                         ;*WHICH TRANSMITS A STEADY STREAM OF CHARACTERS.
 8837                                                                 ; -$XZ-****************************
 8838                                 ;:*  TEST 21
  (5)                                 ;;*****************************************************************
  (4)  015374  000004                 TST21:  SCOPE
  (2)  015376  012737  000021  001122         MOV     #21,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                 ; -- END 0 MACRO ******************
  (2)  015404  012737  015732  001360         MOV     #TST22,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  015412  012737  015710  001362         MOV     #16$,LOCK       ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
 8839                                                                 ;$LINEUP-*****************************
  (2)                                                                 ; -$MRESET-***************************
  (2)  015420  104417                         DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (2)                                 ;  - END 0 MACRO ******************
  (1)  015422  013701  001366                 MOV     PAR,R1          ;PICK UP PARAMETERS
  (1)  015426  012702  000001                 MOV     #1,R2           ;PICK UP INIT POINTER
  (1)  015432  030237  001364          1$:    BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
  (1)  015436  001402                         BEQ     2$              ;NO
  (1)  015440  010177  164406                 MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
  (1)  015444  005201                  2$:    INC     R1              ;POSITION POINTER TO THE NEXT LINE
  (1)  015446  106302                         ASLB    R2              ;GOT 'EM ALL ?
  (1)  015450  103370                         BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
  (1)  015452  005037  001372                 CLR     SAVLIN          ;CLEAR LINE # INDICATOR
  (1)                                 ; -- END 0 MACRO ******************
 8840  015456  012702  000001                 MOV     #1,R2           ;LINE POINTER
 8841  015462  052777  000040  164352         BIS     #MSENAB,@DZCSR  ;START SCANNER
 8842  015470  030237  001364          3$:    BIT     R2,LINE         ;VALID LINE ?
 8843  015474  001462                         BEQ     14$             ;NO SET UP NEXT LINE
 8844  015476  010277  164354                 MOV     R2,@DZTCR       ;SET TCR BIT
 8845  015502  032777  000200  164332  4$:    BIT     #RDONE,@DZCSR   ;IS REC DONE = 0 ?
 8846  015510  001401                         BEQ     5$              ;IF YES, ALLOW TIME FOR TRDY TO SET
 8847  015512  104020                         ERROR   20              ;*REC DONE SHOULD = 0
 8848  015514  005005                  5$:    CLR     R5
 8849  015516  032777  100000  164316  6$:    BIT     #TRDY,@DZCSR
 8850  015524  001004                         BNE     7$
 8851  015526  104414                         DELAY
 8852  015530  105205                         INCB    R5
 8853  015532  001371                         BNE     6$
```

```
 8854  015534  104003                          ERROR   3               ;*TRDY FAILED TO SET!
 8855  015536  112777  000252  164322  7$:     MOVB    #252,@DZTDR     ;LOAD CHARACTER
 8856  015544  013705  001372                  MOV     SAVLIN,R5       ;MAKE EXPECTED LINE #
 8857                                          ; -$STAG-**********************************
  (1)  015550  105737  001371                  TSTB    MODE+1          ;IS THIS TEST IN STAGGERED MODE?
  (1)  015554  001406                          BEQ     10$             ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                          ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  015556  006205                          ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  015560  103402                          BCS     8$              ;IF IT IS SET, GO CLEAR IT
  (1)  015562  000261                          SEC                     ;IF IT IS CLEAR SET IT HERE
  (1)  015564  000401                          BR      9$              ;SKIP THE CLEARING
  (1)  015566  000241                  8$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
  (1)  015570  006105                  9$:     ROL     R5              ;GET THE NEW BIT BACK INTO R5
  (1)                                  ; -- END O MACRO **************
 8858  015572  000305                  10$:    SWAB    R5              ;MOVE THE LINE NUMBER TO THE UPPER BYTE
 8859  015574  152705  000252                  BISB    #252,R5         ;ADD CHARACTER
 8860  015600  052705  100000                  BIS     #DVALID,R5      ;ADD DATA VALID
 8861  015604  005003                          CLR     R3
 8862  015606  032777  000200  164226  11$:    BIT     #RDONE,@DZCSR
 8863  015614  001004                          BNE     12$
 8864  015616  104414                          DELAY
 8865  015620  005203                          INC     R3
 8866  015622  001371                          BNE     11$
 8867  015624  104004                          ERROR   4               ;*RDONE FAILED TO SET!
 8868  015626  017704  164214          12$:    MOV     @DZRBUF,R4      ;LOAD THE VALUE ACTUALLY RECEIVED
 8869  015632  020405                          CMP     R4,R5           ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
 8870  015634  001401                          BEQ     13$             ;IF YES, GO DO THE NEXT LINE
 8871  015636  104006                          ERROR   6               ;*NO DATA/CONTENTS DID NOT COMPARE
 8872  015640  104401                  13$:    SCOP1                   ;CHECK TO SEE IF SWITCH NINE IS SET
 8873  015642  040277  164210          14$:    BIC     R2,@DZTCR       ;CLEAR TCR BIT FOR THAT LINE.
 8874  015646  005237  001372          15$:    INC     SAVLIN          ;INC EXPECTED LINE
 8875  015652  013700  001372                  MOV     SAVLIN,R0       ;SET UP CHARACTER OFFSET
 8876  015656  006300                          ASL     R0              ;MAKE THE OFFSET A POWER OF TWO
 8877  015660  106302                          ASLB    R2              ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
 8878  015662  103302                          BCC     3$              ;IF NO, GO AROUND AGAIN FOR NEXT LINE
 8879  015664  005003                          CLR     R3              ;THIS CODE HAS BEEN INSERTED
 8880  015666  104414                  17$:    DELAY                   ;TO DETECT A PROBLEM FOUND IN FAULT
 8881  015670  105203                          INCB    R3              ;INSERTION. IF AN ERROR OCCURS MORE
 8882  015672  001375                          BNE     17$             ;THAN ONE WORD WAS RECIEVED ON
 8883  015674  032777  000200  164140          BIT     #RDONE,@DZCSR   ;LINE 7.
 8884  015702  001401                          BEQ     18$
 8885  015704  104020                          ERROR   20
 8886  015706  104400                  18$:    ADVANCE                 ;GO TO NEXT TEST
 8887
 8888                                  ;TIGHT SCOPE LOOP FOR THIS TEST. LOOP TRANSMITS CHARACTERS ONLY
 8889
 8890  015710  032777  100000  164124  16$:    BIT     #TRDY,@DZCSR    ;IS TRANSMITTER READY?
 8891  015716  001774                          BEQ     16$             ;IF NOT, WAIT FOR IT
 8892  015720  112777  000252  164140          MOVB    #252,@DZTDR     ;LOAD THE CHARACTER
 8893  015726  104401                          SCOP1                   ;LOOP AGIN IF SW09=1
 8894  015730  000744                          BR      14$             ;OTHERWISE, GO PICK UP THE TEST NORMALLY
 8895
 8896                                          ; -$XZ-***********************************
  (2)                                         ;************************ TEST 22 ********************************
```

```
 8897                                   ;* THIS TEST PROVES THAT THE TRANSMITTER TRANSMITS
 8898                                   ;*CHARACTERS (FLAG MODE)AND THE RECEIVER RECEIVES (FLAG MODE)
 8899                                   ;*(ONE LINE AT A TIME   BASED UPON VALID LINES)
 8900                                   ;*THIS IS THE FIRST TIME THAT ALL DATA IS CHECKED
 8901                                                   ; -$XZ-----------------------------
 8902                                ;:*  TEST 22
  (5)                                ;;*****************************************************************
  (4)  015732  000004                TST22:  SCOPE
  (2)  015734  012737  000022  001122        MOV     #22,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                ; -- END 0 MACRO ------------------
  (2)  015742  012737  016260  001360        MOV     #TST23,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  015750  012737  016064  001362        MOV     #4$,LOCK        ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
 8903                                                   ;$LINEUP--------------------------------
  (2)                                                   ; -$MRESET-----------------------------
  (2)  015756  104417                        DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (2)                                ; -- END 0 MACRO ------------------
  (1)  015760  013701  001366                MOV     PAR,R1          ;PICK UP PARAMETERS
  (1)  015764  012702  000001                MOV     #1,R2           ;PICK UP INIT POINTER
  (1)  015770  030237  001364        1$:     BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
  (1)  015774  001402                        BEQ     2$              ;NO
  (1)  015776  010177  164050                MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
  (1)  016002  005201                2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
  (1)  016004  106302                        ASLB    R2              ;GOT 'EM ALL ?
  (1)  016006  103370                        BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
  (1)  016010  005037  001372                CLR     SAVLIN          ;CLEAR LINE # INDICATOR
  (1)                                ; -- END 0 MACRO ------------------
 8904  016014  012700  001422                MOV     #TDO,R0         ;POINT TO THE DATA AREA
 8905  016020  005020                        CLR     (R0)+           ;CLEAR A DATA WORD
 8906  016022  022700  001462                CMP     #STOP,R0        ;FINISHED ?
 8907  016026  001374                        BNE     .-6             ;NO
 8908  016030  005000                        CLR     R0              ;CLEAR OFFSET
 8909  016032  013737  002046  001400        MOV     DZRBUF,REGIST   ;SAVE FOR ERROR MSG
 8910  016040  012702  000001                MOV     #1,R2           ;LINE POINTER
 8911  016044  052777  000040  163770        BIS     #MSENAB,@DZCSR  ;START SCANNER
 8912  016052  030237  001364          3$:   BIT     R2,LINE         ;VALID LINE ?
 8913  016056  001465                        BEQ     14$             ;NO SET UP NEXT LINE
 8914  016060  010277  163772                MOV     R2,@DZTCR       ;SET TCR BIT
 8915  016064  032777  000200  163750  4$:   BIT     #RDONE,@DZCSR   ;IS REC DONE = 0 ?
 8916  016072  001401                        BEQ     5$              ;IF YES, ALLOW TIME FOR TRDY TO SET
 8917  016074  104020                        ERROR   20              ;*REC DONE SHOULD = 0
 8918  016076  005005                  5$:   CLR     R5
 8919  016100  032777  100000  163734  6$:   BIT     #TRDY,@DZCSR
 8920  016106  001004                        BNE     7$
 8921  016110  104414                        DELAY
 8922  016112  105205                        INCB    R5
 8923  016114  001371                        BNE     6$
 8924  016116  104003                        ERROR   3               ;*TRDY FAILED TO SET!
 8925  016120  116077  001422  163740  7$:   MOVB    TDO(R0),@DZTDR  ;LOAD CHARACTER
 8926  016126  013705  001372                MOV     SAVLIN,R5       ;MAKE EXPECTED LINE #
 8927                                                   ; -$STAG--------------------------------
  (1)  016132  105737  001371                TSTB    MODE+1          ;IS THIS TEST IN STAGGERED MODE?
  (1)  016136  001406                        BEQ     10$             ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  016140  006205                        ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
```

```
 (1)  016142  103402                        BCS     8$              ;IF IT IS SET, GO CLEAR IT
 (1)  016144  000261                        SEC                     ;IF IT IS CLEAR SET IT HERE
 (1)  016146  000401                        BR      9$              ;SKIP THE CLEARING
 (1)  016150  000241                8$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
 (1)  016152  006105                9$:     ROL     R5              ;GET THE NEW BIT BACK INTO R5
 (1)                                ; -- END O MACRO ****************
8928  016154  000305                10$:    SWAB    R5              ;MOVE THE LINE NUMBER TO THE UPPER BYTE
8929  016156  156005  001422               BISB    TDO(R0),R5      ;ADD CHARACTER
8930  016162  052705  100000               BIS     #DVALID,R5      ;ADD DATA VALID
8931  016166  005003                        CLR     R3
8932  016170  032777  000200  163644 11$:  BIT     #RDONE,@DZCSR
8933  016176  001004                        BNE     12$
8934  016200  104414                        DELAY
8935  016202  005203                        INC     R3
8936  016204  001371                        BNE     11$
8937  016206  104004                        ERROR   4               ;*RDONE FAILED TO SET!
8938  016210  017704  163632         12$:   MOV     @DZRBUF,R4      ;LOAD THE VALUE ACTUALLY RECEIVED
8939  016214  020405                        CMP     R4,R5           ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
8940  016216  001401                        BEQ     13$             ;IF YES, GO DO THE NEXT LINE
8941  016220  104006                        ERROR   6               ;*NO DATA/CONTENTS DID NOT COMPARE
8942  016222  104401                13$:    SCOP1                   ;CHECK TO SEE IF SWITCH NINE IS SET
8943  016224  105260  001422               INCB    TDO(R0)         ;INCREMENT BINARY PATTERN FOR THIS LINE
8944  016230  001315                        BNE     4$              ;GO 'ROUND AGAIN FOR NEXT CHARACTER
8945  016232  040277  163620         14$:   BIC     R2,@DZTCR       ;CLEAR TCR BIT FOR THAT LINE.
8946  016236  005237  001372         15$:   INC     SAVLIN          ;INC EXPECTED LINE
8947  016242  013700  001372                MOV     SAVLIN,R0       ;SET UP CHARACTER OFFSET
8948  016246  006300                        ASL     R0              ;MAKE THE OFFSET A POWER OF TWO
8949  016250  106302                        ASLB    R2              ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
8950  016252  103277                        BCC     3$              ;IF NO, GO AROUND AGAIN FOR NEXT LINE
8951  016254  005037  001362               CLR     LOCK            ;MAKE SURE LOCK IS CLEAR FOR NEXT TEST
8952
8953
8954                                                                ; -$XZ-***************************
 (2)                                    ;*********************** TEST 23 ********************************
8955                                    ;*THIS TEST WILL PROVE THAT EACH RECEIVING LINE CAN
8956                                    ;*BE DISABLED BY SETTING THE RCVON BIT TO ZERO
8957                                    ;*FOR EACH LINE IN THE LPR REGISTER.  IT ALSO
8958                                    ;*VERIFIES THAT MASTER CLEAR WILL ZERO DVALID FOR
8959                                    ;*CHARACTERS STORED IN THE SILO.
8960                                                                ; -$XZ-***************************
8961                                ;:*  TEST 23
 (5)                                ;;*****************************************************************
 (4)  016260  000004                TST23:  SCOPE
 (2)  016262  012737  000023  001122        MOV     #23,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (2)                                ; -- END O MACRO ****************
 (2)  016270  012737  016612  001360        MOV     #TST24,NEXT     ;POINT TO THE START OF THE NEXT TEST
8962  016276  105037  001420                CLRB    DONFLG          ;INITIALIZE FOR FIRST TEST LOOP
8963  016302  005037  001372                CLR     SAVLIN          ;ZERO LINE NO. FOR ERROR PEPORT
8964  016306  104417                        DCLASM                  ;EXECUTE MASTER CLEAR
8965  016310  013701  001366                MOV     PAR,R1          ;STORE DEFAULT PARAMETERS
8966  016314  042701  010000                BIC     #RCVON,R1       ;CLEAR RCVON BIT
8967  016320  012702  000001         1$:    MOV     #1,R2           ;INIT LINE POINTER
8968  016324  010177  163522         2$:    MOV     R1,@DZLPR       ;LOAD LINE PARAMETER REGISTER
8969  016330  005201                        INC     R1              ;SET R1 FOR NEXT LINE
8970  016332  106302                        ASLB    R2              ;SHIFT R2 TO NEXT LINE
8971  016334  103373                        BCC     2$              ;ALL LINES LOADED?
```

```
8972  016336  012701  000252          MOV     #252,R1         ;LOAD TRANSMITTING CHARACTER
8973  016342  013702  001364          MOV     LINE,R2         ;COPY ACTIVE LINE BITS
8974  016346  010277  163504          MOV     R2,@DZTCR       ;LOAD TCR BITS
8975  016352  052777  000040  163462  BIS     #MSENAB,@DZCSR  ;SET SCANNER
8976  016360  005005              3$:   CLR     R5              ;INIT DELAY COUNTER
8977  016362  005777  163454      4$:   TST     @DZCSR          ;TRDY SET?
8978  016366  100404                    BMI     5$              ;IF YES BRANCH
8979  016370  104414                    DELAY                   ;IF NOT THEN WAIT
8980  016372  005205                    INC     R5              ;INCREMENT DELAY COUNTER
8981  016374  001372                    BNE     4$              ;DELAY DONE?
8982  016376  104003                    ERROR   3               ;IF YES TRDY FAILED TO SET
8983  016400  117705  163440      5$:   MOVB    @#DZCSR,R5      ;MOVE LINE NO. INTO R5
8984  016404  012703  000001            MOV     #1,R3           ;INIT TCR POINTER
8985  016410  042705  177770            BIC     #^C<7>,R5       ;ISOLATE LINE NO.
8986  016414  001403                    BEQ     21$             ;IF LINE 0 GO TEST TRANSM. FLAG
8987  016416  106303              20$:  ASLB    R3              ;POINT R3 TO NEXT TCR BIT
8988  016420  005305                    DEC     R5              ;DECREMENT R5 UNTIL R3 POINTS
8989  016422  001375                    BNE     20$             ;TO CORRECT TCR BIT
8990  016424  030302              21$:  BIT     R3,R2           ;HAS THIS LINE BEEN SERVICED?
8991  016426  001007                    BNE     6$              ;IF NOT GO SEND CHARACTER
8992  016430  140377  163422            BICB    R3,@DZTCR       ;IF YES CLEAR TCR BIT
8993  016434  001351                    BNE     3$              ;IF MORE LINES SET BRANCH
8994  016436  105737  001420            TSTB    DONFLG          ;IF ALL LOADED IS THIS SECOND PASS
8995  016442  001040                    BNE     12$             ;IF YES BRANCH TO SECOND PART OF TEST
8996  016444  000404                    BR      7$              ;OTHERWISE CONTINUE WITH FIRST PART
8997  016446  110177  163414      6$:   MOVB    R1,@DZTDR       ;TRANSMIT CHARACTER
8998  016452  040302                    BIC     R3,R2           ;CLEAR FLAG FOR THIS LINE
8999  016454  000741                    BR      3$              ;GO WAIT FOR NEXT LINE
9000  016456  005077  163374      7$:   CLR     @DZTCR          ;CLEAR TCR BITS
9001  016462  005005                    CLR     R5              ;CLEAR DELAY COUNTER
9002  016464  104414              8$:   DELAY                   ;WAIT FOR LAST CHARACTER
9003  016466  005205                    INC     R5              ;INCREMENT DELAY COUNTER
9004  016470  001375                    BNE     8$              ;IF NOT FINISHED CONTINUE WAITING
9005  016472  105777  163344            TSTB    @DZCSR          ;RDONE BIT SET?
9006  016476  100003                    BPL     10$             ;IF NO CONTINUE
9007  016500  005037  001372            CLR     SAVLIN          ;IF YES SET LINE NO. TO ZERO
9008  016504  104020                    ERROR   20              ;AND PRINT ERROR
9009  016506  017704  163334      10$:  MOV     @DZRBUF,R4      ;READ SILO
9010  016512  100007                    BPL     11$             ;IF DVALID IS ZERO BRANCH
9011  016514  000304                    SWAB    R4              ;IF SET THEN
9012  016516  042704  177770            BIC     #^C<7>,R4       ;ISOLATE LINE NO. IN R4
9013  016522  010437  001372            MOV     R4,SAVLIN       ;SET SAVLIN FOR ERROR REPORT
9014  016526  104017                    ERROR   17              ;DATA VALID SHOULD NOT BE SET
9015  016530  000766                    BR      10$             ;GO READ SILO AGAIN
9016  016532  105237  001420      11$:  INCB    DONFLG          ;PREPARE FOR SECOND PART OF TEST
9017  016536  013701  001366            MOV     PAR,R1          ;MOVE DEFAULT PARAMETERS TO R1
9018  016542  000666                    BR      1$              ;GO LOAD LPR REGISTER
9019  016544  005005              12$:  CLR     R5              ;INIT DELAY COUNTER
9020  016546  104414              13$:  DELAY                   ;WAIT FOR LAST CHARACTER
9021  016550  005205                    INC     R5              ;TO BE RECEIVED
9022  016552  001375                    BNE     13$             ;DELAY FINISHED?
9023  016554  104413                    DEVICE.CLR              ;IF YES EXECUTE MASTER CLEAR
9024  016556  000240                    NOP
9025  016560  000240                    NOP
9026  016562  105777  163254            TSTB    @DZCSR          ;RDONE SET?
9027  016566  100003                    BPL     14$             ;IF NOT BRANCH
```

```
 9028  016570  005037  001372              CLR     SAVLIN          ;IF YES THEN PRINT OUT
 9029  016574  104020                      ERROR   20              ;REPORT
 9030  016576  017704  163244      14$:    MOV     @DZRBUF,R4      ;READ SILO
 9031  016602  100003                      BPL     15$             ;DATA VALID SET?
 9032  016604  005037  001372              CLR     SAVLIN          ;IF YES THEN PRINT OUT
 9033  016610  104017                      ERROR   17              ;ERROR REPORT
 9034  016612                      15$:
 9035
 9036                                      ; -$XZ-*****************************
  (2)                                     ;************************ TEST 24 ********************************
 9037                                     ;*THIS TEST WILL PROVE THAT:
 9038                                     ;* 1) THE TRANSMITTER 'BREAK BIT" WORKS
 9039                                     ;* 2) THE RECEIVER CAN FLAG "FRAMING ERRORS"
 9040                                     ;* 3) THE RECEIVER CAN FLAG "PARITY ERRORS"
 9041                                     ;*ONLY ONE LINE AT A TIME WILL BE EXERCISED.
 9042                                     ;*THIS TEST WILL NOT BE  EXERCISED UNLESS
 9043                                     ;*CONNECTED BY AN H325, H3271, OR H3190 CONNECTOR
 9044                                     ; -$XZ-*****************************
 9045                              ;:*  TEST 24
  (5)                             ;;*************************************************************************
  (4)  016612  000004             TST24:  SCOPE
  (2)  016614  012737  000024  001122     MOV     #24,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                             ; -- END 0 MACRO ******************
  (2)  016622  012737  017070  001360     MOV     #TST25,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9046  016630  012737  016726  001362     MOV     #3$,LOCK        ;SET FOR LOOP
 9047  016636  005737  001370             TST     MODE            ;ARE WE RUNNING IN INTERNAL MODE?
 9048  016642  001510                      BEQ     12$             ;IF SO, SKIP THIS TEST
 9049                                     ;  $MRESET-*****************************
  (1)  016644  104417                     DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (1)                             ;  - END 0 MACRO ******************
 9050  016646  013701  001366             MOV     PAR,R1          ;PICK UP PARAMETERS
 9051  016652  052701  000300             BIS     #ODDPAR!PARITY,R1 ;FORCE ODD PARITY
 9052  016656  012700  000001             MOV     #1,R0           ;PICK UP INIT POINTER
 9053  016662  030037  001364      1$:    BIT     R0,LINE         ;SHOULD THIS LINE BE SET UP ?
 9054  016666  001402                      BEQ     2$              ;IF NOT,DON'T SET IT UP
 9055  016670  010177  163156             MOV     R1,@DZLPR       ;OTHERWISE, SET UP LINE PARAMETERS
 9056  016674  005201              2$:     INC     R1
 9057  016676  106300                      ASLB    R0              ;GOT 'EM ALL ?
 9058  016700  103370                      BCC     1$              ;NO
 9059  016702  005037  001372             CLR     SAVLIN          ;CLEAR LINE #
 9060  016706  012702  000001             MOV     #1,R2           ;LINE POINTER
 9061  016712  052777  000040  163122     BIS     #MSENAB,@DZCSR  ;SET MASTER SCAN ENABLE
 9062  016720  013737  002046  001400     MOV     DZRBUF,REGIST   ;SAVE FOR ERRR MESSAGE
 9063  016726  030237  001364      3$:    BIT     R2,LINE
 9064  016732  001446                      BEQ     11$
 9065  016734  010277  163116             MOV     R2,@DZTCR       ;SET TCR BIT
 9066  016740  110277  163124             MOVB    R2,@HDZTDR      ;SET BREAK BIT
 9067  016744  112777  000377  163114  4$: MOVB    #377,@DZTDR     ;LOAD CHARACTER
 9068  016752  013705  001372             MOV     SAVLIN,R5       ;MAKE EXPECTED DATA
 9069                                     ; -$STAG-**********************************
  (1)  016756  105737  001371             TSTB    MODE+1          ;IS THIS TEST IN STAGGERED MODE?
  (1)  016762  001406                     BEQ     7$              ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                    ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  016764  006205                    ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
```

```
   (1)  016766  103402                        BCS     5$              ;IF IT IS SET, GO CLEAR IT
   (1)  016770  000261                        SEC                     ;IF IT IS CLEAR SET IT HERE
   (1)  016772  000401                        BR      6$              ;SKIP THE CLEARING
   (1)  016774  000241                5$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
   (1)  016776  006105                6$:     ROL     R5              ;GET THE NEW BIT BACK INTO R5
   (1)                                ; -- END 0 MACRO ----------------
  9070  017000  000305                7$:     SWAB    R5              ;PUT LINE NUMBER IN UPPER BYTE
  9071  017002  052705  130000              BIS     #DVALID!PARER!FRMERR,R5 ;ADD EXPECTED
  9072  017006  005004                        CLR     R4
  9073  017010  032777  000200  163024  8$:  BIT     #RDONE,@DZCSR
  9074  017016  001004                        BNE     9$
  9075  017020  104414                        DELAY
  9076  017022  005204                        INC     R4
  9077  017024  001371                        BNE     8$
  9078  017026  104004                        ERROR   4               ;*RDONE FAILED TO SET!
  9079  017030  017704  163012          9$:   MOV     @DZRBUF,R4      ;ACTUAL
  9080  017034  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED. DO THEY MATCH?
  9081  017036  001401                        BEQ     10$             ;IF YES, GO CLEAN UP
  9082  017040  104006                        ERROR   6               ;*DATA/CONTENTS FAILED TO COMPARE
  9083  017042  105077  163022          10$:  CLRB    @HDZTDR         ;CLEAR BREAK BITS
  9084  017046  104401                        SCOP1                   ;LOOP?
  9085  017050  005237  001372          11$:  INC     SAVLIN          ;INC LINE #
  9086  017054  040277  162776                BIC     R2,@DZTCR       ;CLEAR TCR BIT
  9087  017060  106302                        ASLB    R2
  9088  017062  103321                        BCC     3$
  9089  017064  005037  001362          12$:  CLR     LOCK            ;MAKE SURE LOCK IS CLEAR FOR NEXT TEST
  9090                                                                ; -$LVLTST----------------------------
   (2)                                                                ; -$XZ------------------------------
   (3)                                ;********************** TEST 25 ******************************
   (1)                                ;* THIS TEST VERIFIES THAT THE DEVICE DOES NOT INTERRUPT
   (1)                                ;*WHILE THE PROCESSOR STATUS IS SET EXACTLY
   (1)                                ;*TO WHAT THE DZ11 PRIORITY IS SET TO.
   (1)                                ;*DEFAULT PRIORITY IS AT  5 (240).
   (2)                                                                ; -$XZ ----------------------------
   (3)                                ;:*  TEST 25
   (6)                                ;;**************************************************************
   (5)  017070  000004                TST25:  SCOPE
   (3)  017072  012737  000025  001122        MOV     #25,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
   (3)                                ; -  END 0 MACRO ----------------
   (3)  017100  012737  017400  001360        MOV     #TST26,NEXT     ;POINT TO THE START OF THE NEXT TEST
   (2)                                                                ;$LINEUP--------------------------------
   (3)                                                                ; -$MRESET --------------------------
   (3)  017106  104417                        DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
   (3)                                ; -- END 0 MACRO ----------------
   (2)  017110  013701  001366                MOV     PAR,R1          ;PICK UP PARAMETERS
   (2)  017114  012702  000001                MOV     #1,R2           ;PICK UP INIT POINTER
   (2)  017120  030237  001364          1$:   BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
   (2)  017124  001402                        BEQ     2$              ;NO
   (2)  017126  010177  162720                MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
   (2)  017132  005201                2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
   (2)  017134  106302                        ASLB    R2              ;GOT 'EM ALL ?
   (2)  017136  103370                        BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
   (2)  017140  005037  001372                CLR     SAVLIN          ;CLEAR LINE # INDICATOR
   (2)                                ;    END 0 MACRO ---------- ---
   (1)  017144  106437  030334                MTPS    @#DZPRT         ;SET CPU STATUS TO DZ11 PRIO.
   (1)  017150  113777  001364  162700        MOVB    LINE,@DZTCR     ;ENABLE THE VALID LINES
```

```
   (1)  017156                              3$:
   (2)                                                  ; -$INTSET ***************************
   (2)  017156  012777  017246  162712              MOV     #6$,@DZTIV      ;SET UP THE TRANSMITTER INTERRUPT VECTOR
   (2)  017164  012777  017254  162700              MOV     #7$,@DZRIV      ;SET UP THE RECEIVER INTERRUPT VECTOR
   (2)  017172  013777  030334  162674              MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
   (2)  017200  013777  030334  162672              MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
   (2)  017206  052777  040040  162626              BIS     #TIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
   (2)                                      ; -- END 0 MACRO ******************
   (1)  017214  005005                              CLR     R5
   (1)  017216  032777  100000  162616  4$:         BIT     #TRDY,@DZCSR
   (1)  017224  001403                              BEQ     5$
   (1)  017226  000240                              NOP
   (1)  017230  000240                              NOP
   (1)  017232  000412                              BR      8$
   (1)  017234  104414                      5$:     DELAY
   (1)  017236  005205                              INC     R5
   (1)  017240  001366                              BNE     4$
   (1)  017242  104003                              ERROR   3               ;*TRDY NOT SET!
   (1)  017244  000405                              BR      8$
   (1)  017246  104010                      6$:     ERROR   10              ;*TRANSMITTER SHOULD NOT INTERRUPT
   (1)  017250  022626                              CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
   (1)  017252  000402                              BR      8$              ;CONTINUE TEST
   (1)  017254  104012                      7$:     ERROR   12              ;*RECEIVER SHOULD NOT INTERRUPT
   (1)  017256  022626                              CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
   (1)  017260  042777  040000  162554  8$:         BIC     #TIE,@DZCSR     ;RESET TRANSMITTER INTERRUPT ENABLE
   (2)                                                  ; -$INTSET-***************************
   (2)  017266  012777  017364  162602              MOV     #11$,@DZTIV     ;SET UP THE TRANSMITTER INTERRUPT VECTOR
   (2)  017274  012777  017372  162570              MOV     #12$,@DZRIV     ;SET UP THE RECEIVER INTERRUPT VECTOR
   (2)  017302  013777  030334  162564              MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
   (2)  017310  013777  030334  162562              MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
   (2)  017316  052777  000140  162516              BIS     #RIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
   (2)                                      ;  - END 0 MACRO ******************
   (1)  017324  113777  001422  162534              MOVB    TDO,@DZTDR      ;PUT ANY RANDOM CHARACTER IN TRANSMITTER BUFFER
   (1)  017332  005005                              CLR     R5
   (1)  017334  032777  000200  162500  9$:         BIT     #RDONE,@DZCSR
   (1)  017342  001403                              BEQ     10$
   (1)  017344  000240                              NOP
   (1)  017346  000240                              NOP
   (1)  017350  000412                              BR      13$
   (1)  017352  104414                      10$:    DELAY
   (1)  017354  005205                              INC     R5
   (1)  017356  001366                              BNE     9$
   (1)  017360  104004                              ERROR   4               ;*NO RX DONE! (NOT SET)
   (1)  017362  000405                              BR      13$             ;CONTINUE TEST
   (1)  017364  104010                      11$:    ERROR   10              ;*TRANSMITTER SHOULD NOT INTERRUPT
   (1)  017366  022626                              CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
   (1)  017370  000402                              BR      13$             ;CONT TEST
   (1)  017372  104012                      12$:    ERROR   12              ;*RECEIVER SHOULD NOT INTERRUPT
   (1)  017374  022626                              CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
   (1)  017376                              13$:
   (2)  017376  104413                              DEVICE.CLR              ;ISSUE DEVICE CLEAR (RESET)
   (2)                                      ; -- END 0 MACRO ******-***********
   (1)                                      ; -- END 0 MACRO ******************
  9091
   (2)                                                  ; -$LVLTST-***************************
   (3)                                                  ; -$XZ-*****************************
                                           ;************************ TEST 26 *********************************
```

```
(1)                                             ;* THIS TEST VERIFIES THAT THE DEVICE DOES INTERRUPT
(1)                                             ;*WHILE THE PROCESSOR STATUS IS SET TO EXACTLY
(1)                                             ;*ONE LEVEL LOWER THAN THE DZ11. DZ11 PRIORITY
(1)                                             ;*DEFAULT TO LEVEL 5 MINUS ONE LEVEL IS LEVEL 4.
(2)                                                     ; -$XZ-============================
(3)                                     ;:*  TEST 26
(6)                                     ;;*****************************************************************
(5)  017400  000004                     TST26:  SCOPE
(3)  017402  012737  000026  001122             MOV     #26,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)                                     ; -- END 0 MACRO ==================
(3)  017410  012737  017726  001360             MOV     #TST27,NEXT     ;POINT TO THE START OF THE NEXT TEST
(2)                                             ;$LINEUP-================================
(3)                                             ; -$MRESET ===========================
(3)  017416  104417                             DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
(3)                                     ; -- END 0 MACRO ==================
(2)  017420  013701  001366                     MOV     PAR,R1          ;PICK UP PARAMETERS
(2)  017424  012702  000001                     MOV     #1,R2           ;PICK UP INIT POINTER
(2)  017430  030237  001364             1$:     BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
(2)  017434  001402                             BEQ     2$              ;NO
(2)  017436  010177  162410                     MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
(2)  017442  005201                     2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
(2)  017444  106302                             ASLB    R2              ;GOT 'EM ALL ?
(2)  017446  103370                             BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
(2)  017450  005037  001372                     CLR     SAVLIN          ;CLEAR LINE # INDICATOR
(2)                                     ; -- END 0 MACRO ==================
(1)  017454  106437  030336                     MTPS    @#LESS1         ;MAKE CPU ONE LEVEL LOWER THAN DZ11
(1)  017460  113777  001364  162370             MOVB    LINE,@DZTCR     ;ENABLE THE VALID LINES
(1)  017466                             3$:
(2)                                             ; -$INTSET-==========================
(2)  017466  012777  017560  162402             MOV     #6$,@DZTIV      ;SET UP THE TRANSMITTER INTERRUPT VECTOR
(2)  017474  012777  017576  162370             MOV     #7$,@DZRIV      ;SET UP THE RECEIVER INTERRUPT VECTOR
(2)  017502  013777  030334  162364             MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
(2)  017510  013777  030334  162362             MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
(2)  017516  052777  040040  162316             BIS     #TIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
(2)                                     ;  - END 0 MACRO ==================
(1)  017524  005005                             CLR     R5
(1)  017526  032777  100000  162306     4$:     BIT     #TRDY,@DZCSR
(1)  017534  001404                             BEQ     5$
(1)  017536  000240                             NOP
(1)  017540  000240                             NOP
(1)  017542  104007                             ERROR   7               ;*TRANSMITTER FAILED TO INTERRUPT
(1)  017544  000416                             BR      8$
(1)  017546  104414                     5$:     DELAY
(1)  01755C  005205                             INC     R5
(1)  017552  001365                             BNE     4$
(1)  017554  104003                             ERROR   3               ;*TRDY NOT SET!
(1)  017556  000411                             BR      8$
(1)  017560  022626                     6$:     POP2SP                  ;REMOVE THE INTERRUPT FROM THE STACK
(1)  017562  042777  040000  162252             BIC     #TIE,@DZCSR     ;DON'T LET ANY MORE INTERRUPTS OCCUR
(1)  017570  106437  030336                     MTPS    @#LESS1         ;MAKE CPU ONE LEVEL LOWER THAN DZ11
(1)  017574  000402                             BR      8$              ;RETURN TO THE NORMAL FLOW
(1)  017576  104012                     7$:     ERROR   12              ;*RECEIVER SHOULD NOT INTERRUPT
(1)  017600  022626                             CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
(1)  017602  042777  040000  162232     8$:     BIC     #TIE,@DZCSR     ;RESET TRANSMITTER INTERRUPT ENABLE
(2)                                             ; -$INTSET ==========-=-=-=========-=-=
(2)  017610  012777  017710  162260             MOV     #11$,@DZTIV     ;SET UP THE TRANSMITTER INTERRUPT VECTOR
```

```
   (2)  017616  012777  017716  162246          MOV     #12$,@DZRIV     ;SET UP THE RECEIVER INTERRUPT VECTOR
   (2)  017624  013777  030334  162242          MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
   (2)  017632  013777  030334  162240          MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
   (2)  017640  052777  000140  162174          BIS     #RIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
   (2)                                  ; -- END 0 MACRO ==================
   (1)  017646  113777  001422  162212          MOVB    TDO,@DZTDR      ;PUT ANY RANDOM CHARACTER IN TRANSMITTER BUFFER
   (1)  017654  005005                          CLR     R5
   (1)  017656  032777  000200  162156  9$:     BIT     #RDONE,@DZCSR
   (1)  017664  001404                          BEQ     10$
   (1)  017666  000240                          NOP
   (1)  017670  000240                          NOP
   (1)  017672  104011                          ERROR   11              ;*RECEIVER FAILED TO INTERRUPT
   (1)  017674  000413                          BR      13$
   (1)  017676  104414                  10$:    DELAY
   (1)  017700  005205                          INC     R5
   (1)  017702  001365                          BNE     9$
   (1)  017704  104004                          ERROR   4               ;*NO RX DONE! (NOT SET)
   (1)  017706  000406                          BR      13$             ;CONTINUE TEST
   (1)  017710  104010                  11$:    ERROR   10              ;*TRANSMITTER SHOULD NOT INTERRUPT
   (1)  017712  022626                          CMP     (SP)+,(SP)+     ;POP FOR FAKE RTI
   (1)  017714  000403                          BR      13$             ;CONT TEST
   (1)  017716  022626                  12$:    POP2SP                  ;REMOVE THE INTERRUPT FROM THE STACK
   (1)  017720  005077  162116                  CLR     @DZCSR          ;DON'T ALLOW ANY MORE INTERRUPTS
   (1)  017724                          13$:
   (2)  017724  104413                          DEVICE.CLR              ;ISSUE DEVICE CLEAR (RESET)
   (2)                                  ; -  END 0 MACRO ==================
   (1)                                  ;    END 0 MACRO ==================
  9092
  9093                                                    ; -$XZ-----------------------------
   (2)                                    ;********************** TEST 27 ********************************
  9094                                    ;*THIS TEST VERIFIES THAT THE RECEIVER WILL
  9095                                    ;*INTERRUPT BEFORE THE TRANSMITTER EVEN
  9096                                    ;*THOUGH THE TRANSMITTER WAS ENABLED
  9097                                    ;*FIRST.  SET PS TO LEVEL 7;
  9098                                    ;*GET RDONE AND TRDY TO SET;
  9099                                    ;*SET TX IE AND RX IE;
  9100                                    ;*CLEAR PS AND EXPECT RX TO INTERRUPT FIRST
  9101                                                    ; -$XZ ----------------------------
  9102                                ;:*  TEST 27
   (5)                                ;;*****************************************************************
   (4)  017726  000004                TST27:  SCOPE
   (2)  017730  012737  000027  001122          MOV     #27,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
   (2)                                ; -- END 0 MACRO ----------------
   (2)  017736  012737  020360  001360          MOV     #TST30,NEXT     ;POINT TO THE START OF THE NEXT TEST
  9103                                                    ;$LINEUP--------------------------------
   (2)                                                    ;  $MRESET------------------------------
   (2)  017744  104417                          DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
   (2)                                ; -- END 0 MACRO ----------------
   (1)  017746  013701  001366                  MOV     PAR,R1          ;PICK UP PARAMETERS
   (1)  017752  012702  000001                  MOV     #1,R2           ;PICK UP INIT POINTER
   (1)  017756  030237  001364          1$:     BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
   (1)  017762  001402                          BEQ     2$              ;NO
   (1)  017764  010177  162062                  MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
   (1)  017770  005201                  2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
   (1)  017772  106302                          ASLB    R2              ;GOT 'EM ALL ?
   (1)  017774  103370                          BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
```

```
  (1)  017776  005037  001372                CLR     SAVLIN          ;CLEAR LINE # INDICATOR
  (1)                              ; -- END 0 MACRO ******************
 9104  020002  012777  020232  162062         MOV     #8$,@DZRIV      ;SETUP INTERRUPT STUFF
 9105  020010  013777  030334  162056         MOV     DZPRT,@DZRIS    ;
 9106  020016  012777  020322  162052         MOV     #12$,@DZTIV     ;
 9107  020024  013777  030334  162046         MOV     DZPRT,@DZTIS    ;
 9108  020032  052777  000040  162002         BIS     #MSENAB,@DZCSR
 9109  020040  012702  000001                 MOV     #1,R2           ;LINE POINTER
 9110  020044  030237  001364          3$:    BIT     R2,LINE         ;VALID LINE ?
 9111  020050  001004                         BNE     4$
 9112  020052  005237  001372                 INC     SAVLIN
 9113  020056  106302                         ASLB    R2
 9114  020060  000771                         BR      3$
 9115  020062  106427  000340          4$:    MTPS    #PR7
 9116  020066  000240                         NOP
 9117  020070  000240                         NOP
 9118  020072  110277  161760                 MOVB    R2,@DZTCR       ;SET TCR BIT
 9119  020076  005777  161744                 TST     @DZRBUF         ;VALID DATA?
 9120  020102  100001                         BPL     .+4             ;IT BETTER NOT BE SET
 9121  020104  104017                         ERROR   17              ;DATA VALID SHOULD NOT BE SET
 9122  020106  105777  161730          5$:    TSTB    @DZCSR          ;RECEIVER DONE ?
 9123  020112  100001                         BPL     .+4
 9124  020114  104020                         ERROR   20              ;RECEIVER DONE BIT SHOULD NOT BE SET
 9125  020116  005005                         CLR     R5
 9126  020120  005004                         CLR     R4
 9127  020122  005777  161714          99$:   TST     @DZCSR          ;WAIT FOR TRDY
 9128  020126  100404                         BMI     100$            ;BR IF READY
 9129  020130  104414                         DELAY                   ;STALL TIME
 9130  020132  005204                         INC     R4              ;
 9131  020134  001372                         BNE     99$
 9132  020136  104003                         ERROR   3               ;TRDY FAILED TO SET
 9133  020140  105077  161722          100$:  CLRB    @DZTDR
 9134  020144  005004                         CLR     R4
 9135  020146  032777  000200  161666  6$:    BIT     #RDONE,@DZCSR
 9136  020154  001004                         BNE     7$
 9137  020156  104414                         DELAY
 9138  020160  005204                         INC     R4
 9139  020162  001371                         BNE     6$
 9140  020164  104004                         ERROR   4               ;*RDONE FAILED TO SET!
 9141  020166  005777  161650          7$:    TST     @DZCSR          ;TRANS DONE BIT = 1 ?
 9142  020172  100401                         BMI     .+4             ;YES
 9143  020174  104003                         ERROR   3               ;*NO   TRANS DONE FAILED TO SET
 9144                                         ;NOW THAT BOTH TRANSMITTER AND RECEIVER DONE BIT =1
 9145                                         ;SET INTERRUPT ENABLES AND WATCH THE FUR FLY
 9146  020176  052777  040000  161636         BIS     #TIE,@DZCSR
 9147  020204  052777  000100  161630         BIS     #RIE,@DZCSR
 9148  020212  106427  000000                 MTPS    #0
 9149  020216  000240                         NOP
 9150  020220  000240                         NOP
 9151  020222  104007                         ERROR   7               ;*TRANSMITTER FAILED TO INTERRUPT
 9152  020224  104011                         ERROR   11              ;*RECEIVER FAILED TO INTERRUPT
 9153                                         ;CHECK BR LEVEL
 9154  020226  000137  020326                 JMP     13$     ;GET OUT
 9155
 9156                                         ;RECEIVER INTERRUPT ROUTINE
 9157  020232  017704  161610          8$:    MOV     @DZRBUF,R4              ;ACTUAL
```

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 9158  020236  010403                        MOV     R4,R3
 9159  020240  000303                        SWAB    R3
 9160  020242  042703  177770                BIC     #^C<7>,R3       ;STRIP JUNK
 9161                                        ;  $STAG-**********************************
  (1)  020246  105737  001371                TSTB    MODE+1          ;IS THIS TEST IN STAGGERED MODE?
  (1)  020252  001406                        BEQ     11$             ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                        ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  020254  006203                        ASR     R3              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  020256  103402                        BCS     9$              ;IF IT IS SET, GO CLEAR IT
  (1)  020260  000261                        SEC                     ;IF IT IS CLEAR SET IT HERE
  (1)  020262  000401                        BR      10$             ;SKIP THE CLEARING
  (1)  020264  000241                9$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
  (1)  020266  006103                10$:    ROL     R3              ;GET THE NEW BIT BACK INTO R3
  (1)                                ; -- END 0 MACRO ******************
 9162  020270  020337  001372          11$:    CMP     R3,SAVLIN       ;IS THIS A VALID LINE
 9163  020274  001401                        BEQ     .+4             ;YES
 9164  020276  104015                        ERROR   15              ;*INVALID LINE
 9165  020300  042704  177400                BIC     #^C<377>,R4     ;STRIP JUNK
 9166  020304  120504                        CMPB    R5,R4           ;DATA COMPARE ?
 9167  020306  001401                        BEQ     .+4             ;YES
 9168  020310  104005                        ERROR   5               ;*DATA DOES NOT COMPARE
 9169  020312  040277  161540                BIC     R2,@DZTCR       ;CLEAR TCR BIT
 9170  020316  022626                        POP2SP                  ;REMOVE HE INTERRUPT VECTOR FROM THE STACK
 9171  020320  000402                        BR      13$             ;GO GET OUT OF INTERRUPT MODE
 9172                                        ;TRANSMITTER INTERRUPT SVC ROUTINE
 9173  020322  104011                12$:    ERROR   11              ;THE RECEIVER INTERRUPT FAILED
 9174                                                                ;TO OVERRIDE THE TRANSMITTER
 9175  020324  022626                        POP2SP                  ;REMOVE THE INTERRUPT VECTOR FROM THE STACK
 9176  020326  042777  040100  161506  13$:   BIC     #TIE!RIE,@DZCSR ;CLEAR INTERRUPT ENABLES
 9177  020334  013777  002074  161530        MOV     DZRIS,@DZRIV    ;RESTORE TRAPCATCHER
 9178  020342  005077  161526                CLR     @DZRIS
 9179  020346  013777  002100  161522        MOV     DZTIS,@DZTIV
 9180  020354  005077  161520                CLR     @DZTIS
 9181                                                                ; -$XZ-****************************
  (2)                                       ;************************ TEST 30 *********************************
 9182                                       ;*TEST TO VERIFY THAT 'RDONE DOES NOT SET
 9183                                       ;*IF THE SCANNER IS DISABLED.
 9184                                       ;*TURN ON SCANNER, WAIT FOR TRDY,
 9185                                       ;*TURN OFF SCANNER, TRANSMIT A CHARACTER
 9186                                       ;*'RDONE SHOULD NOT SET.
 9187                                                                ;  $XZ-****************************
 9188                                ;:*  TEST 30
  (5)                               ;;*****************************************************************
  (4)  020360  000004                TST30:  SCOPE
  (2)  020362  012737  000030  001122        MOV     #30,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                ; -- END 0 MACRO ****************---*
  (2)  020370  012737  020546  001360        MOV     #TST31,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9189                                                                ;$LINEUP *******-*****************************
  (2)                                                                ;  $MRESET-****************************
  (2)  020376  104417                        DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (2)                                ;    END 0 MACRO ******************
  (1)  020400  013701  001366                MOV     PAR,R1          ;PICK UP PARAMETERS
  (1)  020404  012702  000001                MOV     #1,R2           ;PICK UP INIT POINTER
  (1)  020410  030237  001364          1$:   BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
```

```
 (1)  020414  001402                        BEQ     2$              ;NO
 (1)  020416  010177  161430                MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
 (1)  020422  005201                2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
 (1)  020424  106302                        ASLB    R2              ;GOT 'EM ALL ?
 (1)  020426  103370                        BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
 (1)  020430  005037  001372                CLR     SAVLIN          ;CLEAR LINE # INDICATOR
 (1)                                ; -- END O MACRO ******************
9190  020434  052777  000040  161400        BIS     #MSENAB,@DZCSR  ;TURN ON SCANNER
9191  020442  012702  000001                MOV     #1,     R2      ;INIT LINE COUNTER
9192  020446  030237  001364          3$:   BIT     R2,     LINE    ;FIND A VALID LINE
9193  020452  001004                        BNE     4$              ;IF WE FOUND ONE GO TO TEST
9194  020454  005237  001372                INC     SAVLIN          ;IF NOT
9195  020460  106302                        ASLB    R2              ;KEEP LOOKING
9196  020462  000771                        BR      3$
9197  020464  110277  161366          4$:   MOVB    R2,     @DZTCR  ;SET TCR BIT
9198  020470  005005                        CLR     R5
9199  020472  005777  161344          5$:   TST     @DZCSR          ;IS TRDY SET
9200  020476  100404                        BMI     6$              ;CON'T TESTING IF IT IS
9201  020500  104414                        DELAY                   ;IF IT NOT WAIT A WHILE
9202  020502  005205                        INC     R5
9203  020504  001372                        BNE     5$
9204  020506  104003                        ERROR   3               ;WE WAITED LONG ENOUGH-ERROR
9205  020510  042777  000040  161324  6$:   BIC     #MSENAB, @DZCSR ;TURN OFF SCANNER
9206  020516  105077  161344                CLRB    @DZTDR          ;TRANSMIT A CHARACTER
9207  020522  005005                        CLR     R5              ;CLEAR COUNTER
9208  020524  104414                7$:     DELAY                   ;WAIT SUFFICIENT TIME FOR
9209  020526  005205                        INC     R5              ;RDONE TO SET
9210  020530  001375                        BNE     7$
9211  020532  032777  000200  161302        BIT     #RDONE, @DZCSR  ;RDONE SET
9212  020540  001401                        BEQ     8$              ;IT SHOULDN'T BE-CONTINUE
9213  020542  104020                        ERROR   20              ;IF IT IS THERE'S AN ERROR
9214  020544  104400                8$:     ADVANCE
9215                                                                ; -$XZ-****************************
 (2)                                        ;*********************** TEST 31 *********************************
9216                                        ;*THIS TEST VERIFIES OVERRUN AND SILO ALARM
9217                                        ;*ONE LINE AT A TIME  - BASED UPON VALID LINES
9218                                        ;*AS EACH OF THE FIRST 16 CHARS ARE SENT; SILO ALARM IS
9219                                        ;*TESTED TO BE CLEARED. ON THE 16TH CHAR THE PROGRAM THEN
9220                                        ;*EXPECTS SILO ALARM TO SET. THEN THE ENTIRE
9221                                        ;*SILO IS FILLED AND AN OVERRUN IS EXPECTED ON THE 65TH
9222                                        ;*CHAR PULLED OUT OUT THE SILO.
9223                                        ;*USING SWITCH NINE FOR THIS TEST SENDS 20. CHARACTERS
9224                                        ;*ON DZ LINE PREVIOUSLY SELECTED CONTINUOUSLY WHILE SW09=1.
9225                                        ;*USED TO SCOPE SILO ALARM PULSES, ETC.
9226                                                                ; -$XZ-****************************
9227                                ;:*  TEST 31
 (5)                                ;;*****************************************************************
 (4)  020546  000004                TST31:  SCOPE
 (2)  020550  012737  000031  001122        MOV     #31,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (2)                                ; -- END O MACRO ******************
 (2)  020556  012737  021274  001360        MOV     #TST32,NEXT     ;POINT TO THE START OF THE NEXT TEST
9228  020564  012737  021200  001362        MOV     #18$,LOCK       ;SET FOR LOOP
9229                                                                ;$LINEUP ********************************
 (2)                                                                ; -$MRESET-***************************
 (2)  020572  104417                        DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
 (2)                                ; -- END O MACRO ******************
```

```
 (1)  020574  013701  001366                    MOV     PAR,R1          ;PICK UP PARAMETERS
 (1)  020600  012702  000001                    MOV     #1,R2           ;PICK UP INIT POINTER
 (1)  020604  030237  001364          1$:       BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
 (1)  020610  001402                            BEQ     2$              ;NO
 (1)  020612  010177  161234                    MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
 (1)  020616  005201                  2$:       INC     R1              ;POSITION POINTER TO THE NEXT LINE
 (1)  020620  106302                            ASLB    R2              ;GOT 'EM ALL ?
 (1)  020622  103370                            BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
 (1)  020624  005037  001372                    CLR     SAVLIN          ;CLEAR LINE # INDICATOR
 (1)                                  ; -- END O MACRO ==================
9230  020630  012700  001422                    MOV     #TDO,R0         ;POINT TO THE DATA AREA
9231  020634  005020                            CLR     (R0)+           ;CLEAR A DATA WORD
9232  020636  022700  001462                    CMP     #STOP,R0        ;FINISHED ?
9233  020642  001374                            BNE     .-6             ;NO
9234  020644  005000                            CLR     R0              ;CLEAR OFFSET
9235  020646  012702  000001                    MOV     #1,R2           ;LINE POINTER
9236  020652  052777  010040  161162            BIS     #MSENAB!SILOEN,@DZCSR   ;START SCANNER & SET SILO ENABLE
9237  020660  030237  001364          3$:       BIT     R2,LINE         ;VALID LINE?
9238  020664  001002                            BNE     .+6             ;YES
9239  020666  000137  021162                    JMP     22$             ;TRY NEXT LINE
9240  020672  013700  001372                    MOV     SAVLIN,R0       ;MAKE OFFSET
9241  020676  006300                            ASL     R0              ;MAKE POWER OF TWO
9242  020700  010277  161152                    MOV     R2,@DZTCR       ;SET TCR BIT
9243  020704  105777  161132          4$:       TSTB    @DZCSR          ;REC DONE = 1 ?
9244  020710  100001                            BPL     .+4
9245  020712  104020                            ERROR   20              ;REC DONE SHOULD NOT = 1
9246  020714  005003                            CLR     R3              ;SET CHARACTER COUNT
9247  020716  005004                  5$:       CLR     R4
9248  020720  032777  100000  161114  6$:       BIT     #TRDY,@DZCSR
9249  020726  001004                            BNE     7$
9250  020730  104414                            DELAY
9251  020732  105204                            INCB    R4
9252  020734  001371                            BNE     6$
9253  020736  104003                            ERROR   3               ;*TRDY FAILED TO SET
9254  020740  116077  001422  161120  7$:       MOVB    TDO(R0),@DZTDR  ;LOAD A CHARACTER
9255  020746  005260  001422                    INC     TDO(R0)         ;SET UP NEXT CHARACTER
9256  020752  020327  000017                    CMP     R3,#15.         ;16 CHARACTERS ?
9257  020756  103006                            BHIS    8$
9258  020760  032777  020000  161054            BIT     #SILOAL,@DZCSR  ;SILO ALARM = 0 ?
9259  020766  001401                            BEQ     .+4             ;YES
9260  020770  104013                            ERROR   13              ;*SILO ALARM SHOULD NOT = 1
9261                                                                    ;UNTIL 16. DATA CHARACTERS
9262  020772  000411                            BR      10$
9263  020774  005004                  8$:       CLR     R4
9264  020776  032777  020000  161036  9$:       BIT     #SILOAL,@DZCSR
9265  021004  001004                            BNE     10$
9266  021006  104414                            DELAY
9267  021010  005204                            INC     R4
9268  021012  001371                            BNE     9$
9269  021014  104014                            ERROR   14              ;*SILO ALARM FAILED TO SET!
9270                                                                    ;SILO ALARM SHOULD =1 AFTER 16.
9271                                                                    ;DATA CHARACTERS
9272  021016  005203                  10$:      INC     R3              ;INC CHAR COUNT
9273  021020  022703  000102                    CMP     #66.,R3         ;FINISHED SENDING CHARACTERS ?
9274  021024  001334                            BNE     5$              ;NO
9275  021026  005004                            CLR     R4
```

```
 9276  021030  104414                          DELAY
 9277  021032  105204                          INCB    R4
 9278  021034  001375                          BNE     .-4
 9279                                          ;NOW LETS READ THE SILO
 9280  021036  013705  001372                  MOV     SAVLIN,R5       ;MAKE EXPECTED LINE #
 9281                                          ; -$STAG-**********************************
  (1)  021042  105737  001371                  TSTB    MODE+1          ;IS THIS TEST IN STAGGERED MODE?
  (1)  021046  001406                          BEQ     13$             ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                          ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  021050  006205                          ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  021052  103402                          BCS     11$             ;IF IT IS SET, GO CLEAR IT
  (1)  021054  000261                          SEC                     ;IF IT IS CLEAR SET IT HERE
  (1)  021056  000401                          BR      12$             ;SKIP THE CLEARING
  (1)  021060  000241                  11$:    CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
  (1)  021062  006105                  12$:    ROL     R5              ;GET THE NEW BIT BACK INTO R5
  (1)                                  ; -- END O MACRO **************
 9282  021064  000305                  13$:    SWAB    R5              ;PUT IN UPPER BYTE
 9283  021066  052705  100000                  BIS     #DVALID,R5      ;ADD DATA VALID
 9284  021072  017704  160750          14$:    MOV     @DZRBUF,R4      ;ACTUAL
 9285  021076  020405                          CMP     R4,R5           ;ACTUAL VS. EXPECTED
 9286  021100  001401                          BEQ     15$             ;YES
 9287  021102  104006                          ERROR   6               ;*DATA/CONTENTS DID NOT COMPARE
 9288  021104  032777  020000  160730  15$:    BIT     #SILOAL,@DZCSR  ;SILO ALARM= 0 ?
 9289  021112  001401                          BEQ     16$             ;YES
 9290  021114  104016                          ERROR   16              ;READING DZRBUF DID NOT CLEAR SILO ALARM
 9291  021116  005205                  16$:    INC     R5              ;UP CHARACTER
 9292  021120  120527  000077                  CMPB    R5,#63.         ;LAST SILO CHAR ?....64TH CHAR
 9293  021124  101762                          BLOS    14$
 9294  021126  005205                          INC     R5              ;ADD 1 MORE FOR THE CLOBBERED CHAR
 9295  021130  052705  040000                  BIS     #OVRRUN,R5      ;ADD OVERRUN TO EXPECTED
 9296  021134  120527  000101                  CMPB    R5,#65.         ;LAST CHARACTER ?
 9297  021140  001754                          BEQ     14$
 9298  021142  017704  160700                  MOV     @DZRBUF,R4      ;FOR GOOD MEASURE
 9299  021146  005704                          TST     R4              ;DATA VALID SHOULD = 0
 9300  021150  100001                          BPL     17$             ;YES
 9301  021152  104017                          ERROR   17              ;DATA VALID SHOULD = 0
 9302  021154  040277  160676          17$:    BIC     R2,@DZTCR       ;CLR TCR BIT
 9303  021160  104401                          SCOP1                   ;LOOP?
 9304  021162  005237  001372          22$:    INC     SAVLIN          ;INC EXPECTED LINE
 9305  021166  106302                          ASLB    R2              ;NEXT LINE
 9306  021170  103402                          BCS     .+6             ;NO
 9307  021172  000137  020660                  JMP     3$              ;YES
 9308  021176  104400                          ADVANCE                 ;GO TO NEXT TEST
 9309
 9310                                          ;TIGHT SCOPE LOOP FOR THIS TEST. SENDS 20. CHARACTERS
 9311                                          ;ON DZ LINE PREVIOUSLY SELECTED CONTINUOUSLY WHILE SW09=1.
 9312                                          ;USED TO SCOPE SILO ALARM PULSES, ETC.
 9313
 9314  021200  052777  010040  160634  18$:    BIS     #MSENAB!SILOEN,@DZCSR   ;SETUP DEVICE
 9315  021206  012777  021264  160662          MOV     #20$,@DZTIV     ;SETUP TRANSMITTER VECTOR
 9316  021214  012737  000024  001216          MOV     #20.,$TMP0      ;TEMPORARY COUNT OF CHARACTER BURST
 9317  021222  050277  160630                  BIS     R2,@DZTCR       ;ENABLE LINE
 9318  021226  052777  040000  160606          BIS     #TIE,@DZCSR     ;ENABLE INTERRUPTS
 9319  021234  106427  000000                  MTPS    #0              ;LOWER PRIORITY
```

```
 9320  021240  000001                    19$:    WAIT                    ;ALLOW INTERRUPTS
 9321  021242  005337  001216                    DEC     $TMPO           ;REDUCE COUNT. ALL CHARACTERS SENT?
 9322  021246  001374                            BNE     19$             ;IF NO, WAIT FOR MORE
 9323  021250  042777  050040  160564            BIC     #SILOEN!MSENAB!TIE,@DZCSR ;RESET SILO COUNTER, CLEAR STROBE
 9324  021256  104401                            SCOP1                   ;LOOP AGAIN?
 9325  021260  000137  021154                    JMP     17$             ;IF NOT, RETURN TO WHERE YOU LEFT OFF
 9326  021264  112777  000252  160574  20$:     MOVB    #252,@DZTDR     ;SEND A CHARACTER
 9327  021272  000002                            RTI                     ;ALLOW MORE CHARACTERS TO COME
 9328                                                                    ; -$XZ-----------------------------
  (2)                                           ;************************ TEST 32 *******************************
 9329                                           ;*THIS TEST THAT "SILO ENABLE" WILL INHIBIT
 9330                                           ;*RECEIVER INTERRUPTS AND THAT ON THE
 9331                                           ;*16TH CHAR THAT "SILO ALARM" WILL CAUSE AN
 9332                                           ;*INTERRUPT WITH "RIE" SET.
 9333                                           ;*THIS WILL DO ALL SELECTED LINES ONE AT A TIME.
 9334                                                                    ; -$XZ-----------------------------
 9335                                   ;::*  TEST 32
  (5)                                   ;;*****************************************************************
  (4)  021274  000004                    TST32:  SCOPE
  (2)  021276  012737  000032  001122            MOV     #32,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                   ; -- END 0 MACRO ******************
  (2)  021304  012737  021656  001360            MOV     #TST33,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9336  021312  012737  021400  001362            MOV     #3$,LOCK        ;SET FOR LOOP
 9337                                                                    ;$LINEUP--------------------------------
  (2)                                                                    ; -$MRESET------------------------------
  (2)  021320  104417                            DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (2)                                   ; -- END 0 MACRO ******************
  (1)  021322  013701  001366                    MOV     PAR,R1          ;PICK UP PARAMETERS
  (1)  021326  012702  000001                    MOV     #1,R2           ;PICK UP INIT POINTER
  (1)  021332  030237  001364            1$:     BIT     R2,LINE         ;SHOULD THIS LINE BE SET UP ?
  (1)  021336  001402                            BEQ     2$              ;NO
  (1)  021340  010177  160506                    MOV     R1,@DZLPR       ;SET UP LINE PARAMETERS
  (1)  021344  005201                    2$:     INC     R1              ;POSITION POINTER TO THE NEXT LINE
  (1)  021346  106302                            ASLB    R2              ;GOT 'EM ALL ?
  (1)  021350  103370                            BCC     1$              ;IF NO, GO SET UP THE NEXT LINE
  (1)  021352  005037  001372                    CLR     SAVLIN          ;CLEAR LINE # INDICATOR
  (1)                                   ; -- END 0 MACRO ******************
 9338  021356  012700  001422                    MOV     #TDO,R0         ;POINT TO THE DATA AREA
 9339  021362  005020                            CLR     (R0)+           ;CLEAR A DATA WORD
 9340  021364  022700  001462                    CMP     #STOP,R0        ;FINISHED ?
 9341  021370  001374                            BNE     .-6             ;NO
 9342  021372  005000                            CLR     R0              ;CLEAR OFFSET
 9343  021374  012702  000001                    MOV     #1,R2           ;LINE POINTER
 9344  021400  012777  021620  160464  3$:     MOV     #11$,@DZRIV     ;SET FOR UNEXPECTED INTER.
 9345  021406  012777  000340  160460            MOV     #PR7,@DZRIS     ;SET PRIO.
 9346  021414  052777  010140  160420            BIS     #MSENAB!SILOEN!RIE,@DZCSR
 9347                                                                    ;START SCANNER & SET SILO ENABLE
 9348  021422  030237  001364                    BIT     R2,LINE         ;VALID LINE?
 9349  021426  001002                            BNE     .+6             ;YES
 9350  021430  000137  021636                    JMP     22$             ;TRY NEXT LINE
 9351  021434  005777  160406                    TST     @DZRBUF         ;EMPTY THE SILO
 9352  021440  100775                            BMI     .-4             ;BR IF DATA VALID IS SET!
 9353  021442  106427  000000                    MTPS    #0              ;SET PROCESSOR PRIORITY TO 0
 9354  021446  013700  001372                    MOV     SAVLIN,R0       ;MAKE OFFSET
 9355  021452  006300                            ASL     R0              ;MAKE POWER OF TWO
 9356  021454  010277  160376                    MOV     R2,@DZTCR       ;SET TCR BIT
```

```
 9357  021460  005004                  5$:     CLR     R4
 9358  021462  032777  100000  160352  6$:     BIT     #TRDY,@DZCSR
 9359  021470  001004                          BNE     7$
 9360  021472  104414                          DELAY
 9361  021474  005204                          INC     R4
 9362  021476  001371                          BNE     6$
 9363  021500  104003                          ERROR   3               ;*TRDY FAILED TO SET
 9364  021502  116077  001422  160356  7$:     MOVB    TDO(R0),@DZTDR  ;LOAD A CHARACTER
 9365  021510  005260  001422                  INC     TDO(R0)         ;SET UP NEXT CHARACTER
 9366  021514  022760  000017  001422          CMP     #15.,TDO(R0)    ;15 CHARS YET?
 9367  021522  001406                          BEQ     8$
 9368  021524  032777  020000  160310          BIT     #SILOAL,@DZCSR  ;SILO ALARM = 0 ?
 9369  021532  001401                          BEQ     .+4             ;YES
 9370  021534  104013                          ERROR   13              ;*SILO ALARM SHOULD NOT = 1
 9371                                                                  ;UNTIL 16. DATA CHARACTERS
 9372  021536  000750                          BR      5$
 9373  021540  012777  021626  160324  8$:     MOV     #12$,@DZRIV     ;SET NEW VECTOR
 9374  021546  032777  100000  160266          BIT     #TRDY,@DZCSR    ;READY FOR 16TH CHAR
 9375  021554  001774                          BEQ     .-6
 9376  021556  016077  001422  160302          MOV     TDO(R0),@DZTDR  ;LOAD THE 16TH CHAR.
 9377  021564  005004                          CLR     R4
 9378  021566  032777  020000  160246  9$:     BIT     #SILOAL,@DZCSR
 9379  021574  001005                          BNE     10$
 9380  021576  104414                          DELAY
 9381  021600  005204                          INC     R4
 9382  021602  001371                          BNE     9$
 9383  021604  104014                          ERROR   14              ;*SILO ALARM FAILED TO SET!
 9384  021606  000410                          BR      17$             ;SILO ALARM SHOULD =1 AFTER 16.
 9385                                                                  ;DATA CHARACTERS
 9386  021610  000240                  10$:    NOP                     ;STALL
 9387  021612  000240                          NOP
 9388  021614  104000                          ERROR                   ;SILO ALARM NOT INTERRUPTING.
 9389  021616  000404                          BR      17$             ;CONTINUE TEST.
 9390  021620  022626          11$:    CMP     (SP)+,(SP)+            ;FAKE RTI
 9391  021622  104012                          ERROR   12              ;RX SHOULD NOT INTERRUPT
 9392  021624  000401                          BR      17$             ;CONTINUE
 9393  021626  022626          12$:    CMP     (SP)+,(SP)+            ;GOOD INTERRUPT TO HERE.
 9394  021630  040277  160222  17$:    BIC     R2,@DZTCR       ;CLR TCR BIT
 9395  021634  104401                  SCOP1                   ;LOOP?
 9396  021636  005237  001372  22$:    INC     SAVLIN          ;INC EXPECTED LINE
 9397  021642  106302                  ASLB    R2              ;NEXT LINE
 9398  021644  103402                  BCS     .+6             ;NO
 9399  021646  000137  021400          JMP     3$              ;YES
 9400  021652  005037  001362          CLR     LOCK            ;CLEAR TIGHT LOOP FOR NEXT TEST
```

```
 9402
 9403                                                   ; -$XZ **************************
  (2)                                          ;********************** TEST 33 ********************************
 9404                                          ;*THIS TEST RUNS ALL LINES FULL BORE
 9405                                          ;*BASED UPON QUALIFIED LINES
 9406                                          ;*..THIS IS AN INTERRUPT TEST ON THE RECEIVER AND
 9407                                          ;*TRANSMITTER
 9408                                                   ; -$XZ-**************************
 9409                                          ;:*  TEST 33
  (5)                                          ;;*************************************************************
  (4)  021656  000004                         TST33:  SCOPE
  (2)  021660  012737  000033  001122                 MOV     #33,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                         ;  - END 0 MACRO ******************
  (2)  021666  012737  022464  001360                 MOV     #TST34,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9410                                                   ; -$MRESET-**************************
  (1)  021674  104417                                 DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (1)                                         ;  - END 0 MACRO ******************
 9411  021676  013737  001364  022462                 MOV     LINE,RXTCR      ;SET IMAGE OF TCR BITS
 9412  021704  013701  001366                 RSTART: MOV     PAR,R1          ;PICK UP PARAMETER
 9413  021710  012700  000001                         MOV     #1,R0           ;;PICK UP INIT POINTER
 9414  021714  030037  001364                 INIT:   BIT     R0,LINE         ;SHOULD THIS LINE BE SET UP
 9415  021720  001402                                 BEQ     1$              ;NO
 9416  021722  010177  160124                         MOV     R1,@DZLPR       ;SET UP LINE PARAM REGISTER
 9417  021726  005201                         1$:     INC     R1
 9418  021730  106300                                 ASLB    R0              ;GOT 'EM ALL ?
 9419  021732  103370                                 BCC     INIT            ;NO
 9420  021734  012700  001422                         MOV     #TDO,R0         ;CLEAR TRANS DATA POINTER & REC POINTERS
 9421  021740  005020                         INIT1:  CLR     (R0)+
 9422  021742  022700  001462                         CMP     #STOP,R0                ;FINISHED ?
 9423  021746  001374                                 BNE     INIT1           ;NO, CONTINUE CLEARING
 9424  021750  012777  022204  160114                 MOV     #RXSVC,@DZRIV   ;SET UP REC INTR VECTOR
 9425  021756  012777  000340  160110                 MOV     #PR7,@DZRIS     ;STATUS
 9426  021764  012777  022106  160104                 MOV     #TXSVC,@DZTIV   ;SET UP TRANS INTR VECTOR
 9427  021772  012777  000340  160100                 MOV     #PR7,@DZTIS     ;STATUS
 9428  022000  052777  000100  160034                 BIS     #RIE,@DZCSR             ;SET REC INTR ENABLE
 9429  022006  052777  040000  160026                 BIS     #TIE,@DZCSR             ;SET TRANS INTR ENABLE
 9430  022014  052777  000040  160020                 BIS     #MSENAB,@DZCSR  ;SET MASTER SCAN ENABLE
 9431  022022  113777  001364  160026                 MOVB    LINE,@DZTCR     ;SET TCR BITS...UP UP AND AWAY !
 9432  022030  106437  030336                         MTPS    @#LESS1                 ;ALLOW INTERRUPTS
 9433
 9434
 9435  022034  005037  022104         SNAP:   CLR     66$
 9436  022040  013727  007204         67$:    MOV     DLYCNT,(PC)+    ;SET FOR DELAY
 9437  022044  000000                 68$:    0
 9438  022046  005337  022044                 DEC     68$
 9439  022052  001375                         BNE     .-4
 9440  022054  105737  022462                 TSTB    RXTCR           ;WAIT FOR ALL RECIEVERS TO FINISH
 9441  022060  001002                         BNE     3$              ;
 9442  022062  000137  022362                 JMP     OUT
 9443  022066  005237  022104         3$:     INC     66$
 9444  022072  001362                         BNE     67$
 9445  022074  104007                         ERROR   7               ;*TRANSMITTER FAILED TO INTERRUPT
 9446  022076  104011                         ERROR   11              ;*RECEIVER FAILED TO INTERRUPT
 9447  022100  000137  022434                 JMP     FINI
 9448  022104  000000                 66$:    0
 9449
```

```
 9450                                   ;TRANS INTR SVC ROUTINE
 9451  022106  005777  157730  TXSVC:  TST     @DZCSR          ;TRANS INTR ?
 9452  022112  100401                  BMI     .+4
 9453  022114  104003                  ERROR   3               ;*TRANSMITTER FAILED
 9454  022116  117703  157722          MOVB    @HDZCSR,R3      ;SAVE IT
 9455                                   ;NOW TEST FOR LINE # ETC
 9456  022122  042703  177770          BIC     #^C<7>,R3       ;STRIP JUNK
 9457  022126  010304                  MOV     R3,R4           ;SAVE
 9458  022130  010337  001372          MOV     R3,SAVLIN       ;ADJUST LOCATION FOR ERROR PRINTOUT
 9459  022134  012702  000001          MOV     #1,R2           ;SET UP POSITION POINTER
 9460  022140  105303          3$:     DECB    R3              ;IS IT THIS LINE ?
 9461  022142  100402                  BMI     4$              ;YES
 9462  022144  006302                  ASL     R2              ;UP THE LINE #
 9463  022146  000774                  BR      3$              ;GO 'ROUND AGAIN
 9464  022150  030237  001364  4$:     BIT     R2,LINE         ;VALID LINE?
 9465  022154  001001                  BNE     .+4             ;YES
 9466  022156  104010                  ERROR   10              ;NO,INVALID LINE!!!!
 9467  022160  006304                  ASL     R4              ;MAKE POWER OF 2
 9468  022162  116477  001422  157676  MOVB    TDO(R4),@DZTDR  ;LOAD CHARACTER
 9469  022170  105264  001422          INCB    TDO(R4)         ;SET UP NEXT CHARACTER
 9470  022174  001002                  BNE     5$              ;LAST CHARACTER ?
 9471  022200  040277  157654          BIC     R2,@DZTCR       ;YES ,CLEAR TCR BIT
 9472  022204  000002          5$:     RTI
 9473
 9474
 9475                                   ;REC INTR SVC ROUTINE
 9476  022204  105777  157632  RXSVC:  TSTB    @DZCSR          ;REC DONE ?
 9477  022210  100401                  BMI     .+4             ;YES
 9478  022212  104004                  ERROR   4               ;FALSE INTERRUPT
 9479  022214  017704  157626          MOV     @DZRBUF,R4      ;SAVE IT
 9480  022220  010403                  MOV     R4,R3
 9481  022222  000303                  SWAB    R3
 9482  022224  042703  177770          BIC     #^C<7>,R3       ;STRIP JUNK
 9483  022230  010337  001372          MOV     R3,SAVLIN       ;SAVE LINE NUMBER
 9484  022234  032777  020000  157600  BIT     #SILOAL,@DZCSR  ;SILO ALARM?
 9485  022242  001401                  BEQ     .+4             ;NO
 9486  022244  104000                  ERROR                   ;SILO ALARM SHOULD NOT =1
 9487  022246  005704                  TST     R4              ;DATA VALID SET?
 9488  022250  100401                  BMI     .+4             ;YES
 9489  022252  104023                  ERROR   23              ;YOU LOSE  ...DATA VALID WAS'NT SET
 9490  022254  032704  070000          BIT     #OVRRUN!FRMERR!PARER,R4
 9491  022260  001401                  BEQ     .+4
 9492  022262  104000                  ERROR                   ;RECEIVER ERROR FLAG/S WERE SET
 9493  022264  012702  000001          MOV     #1,R2           ;SET UP POSITION POINTER
 9494  022270  105303          5$:     DECB    R3
 9495  022272  100402                  BMI     6$
 9496  022274  006302                  ASL     R2              ;RE POSITION POINTER
 9497  022276  000774                  BR      5$              ;GO 'ROUND AGAIN
 9498  022300  030237  001364  6$:     BIT     R2,LINE         ;LINE VALID ?
 9499  022304  001001                  BNE     .+4             ;YES
 9500  022306  104011                  ERROR   11              ;INVALID LINE #
 9501  022310  013703  001372          MOV     SAVLIN,R3       ;GET THE LINE NUMBER AGAIN
 9502  022314  006303                  ASL     R3              ;USE R3 AS A POINTER IN THE DATA TABLE
 9503  022316  126304  001442          CMPB    TRO(R3),R4      ;DOES THE DATA CHARACTER COMPARE ?
 9504  022322  001405                  BEQ     2$              ;YES
 9505  022324  016305  001442          MOV     TRO(R3),R5      ;SAVE EXPECTED
```

```
 9506  022330  042704  177400            BIC     #^C<377>,R4     ;CLEAR JUNK
 9507                                              ;R2 = LINE # BY BIT POSITION
 9508                                              ;R4 = ACTUAL DATA
 9509                                              ;R5 = EXPECTED DATA
 9510  022334  104005                    ERROR   5               ;*NO. DATA DOES NOT COMPARE
 9511  022336  005263  001442      2$:   INC     TRO(R3)         ;SET UP FOR NEXT CHARACTER
 9512  022342  105763  001442            TSTB    TRO(R3) ;ALL CHARS DONE?
 9513  022346  001002                    BNE     .+6
 9514  022350  040237  022462            BIC     R2,RXTCR        ;ZERO LINE DONE INDICATOR.
 9515  022354  012716  022034            MOV     #SNAP,(SP)      ;RESET THE BACKGROUND TIMING LOOP
 9516  022360  000002                    RTI
 9517
 9518
 9519                                    ;FINISH UP ROUTINE
 9520  022362  106427  000340      OUT:  MTPS    #PR7                    ;STOP ALL INTERRUPTS
 9521  022366  104413                    DEVICE.CLR              ;CLEAR ALL INTERRUPTS AWAY
 9522  022370  005003                    CLR     R3
 9523  022372  005037  001372            CLR     SAVLIN
 9524  022376  012702  000001            MOV     #1,R2
 9525  022402  030237  001364      1$:   BIT     R2,LINE         ;VALID LINE ?
 9526  022406  001405                    BEQ     2$              ;NO
 9527  022410  022763  000400  001442    CMP     #400,TRO(R3)    ;RECEIVED A BINARY COUNT PATTERN ?
 9528  022416  001401                    BEQ     .+4             ;YES
 9529  022420  104027                    ERROR   27              ;THE LINE FAILED TO RECEIVE A FULL
 9530                                              ;BINARY COUNT PATTERN
 9531  022422  005237  001372      2$:   INC     SAVLIN          ;SET UP FOR NEXT LINE
 9532  022426  005723                    TST     (R3)+           ;ADD 2
 9533  022430  106302                    ASLB    R2              ;SET UP NEXT LINE POINTER
 9534  022432  103363                    BCC     1$              ;FINISHED ?
 9535  022434                    FINI:
 9536  022434  013777  002074  157430    MOV     DZRIS,@DZRIV    ;RESTORE TRAPCATCHER
 9537  022442  005077  157426            CLR     @DZRIS
 9538  022446  013777  002100  157422    MOV     DZTIS,@DZTIV
 9539  022454  005077  157420            CLR     @DZTIS
 9540  022460  104400                    ADVANCE                 ;GO TO THE NEXT TEST
 9541  022462  000000              RXTCR:  0                       ;RX IMAGE OF TCR BITS
 9542
 9543
 9544                                              ; -$XZ-============================
  (2)                                 ;************************ TEST 34 ********************************
 9545                                 ;*DZ11 RELATIVE TIMING TEST.
 9546                                 ;*EACH SELECTED LINE WILL IN TURN RUN 16. CHARS
 9547                                 ;*AT ALL BAUD RATES AND THEN THE HIGHEST BAUD
 9548                                 ;*WITH ALL CHAR LENGTHS. EACH NEW PARAMETER SHOULD
 9549                                 ;*DECREASE IN TIME FROM THE PREVIOUS PARAMETERS SELECTED.
 9550                                 ;*THE TIME IS CHECKED AGAINST THE LAST PARAMETER USED
 9551                                 ;* AND A LOWER TIME IS EXPECTED ON THE CURRENT PARAMETER.
 9552                                 ;*PARAMETERS ARE:
 9553                                 ;*  EIGHT BITS/PER/CHAR - TWO STOP BITS AT
 9554                                 ;*       50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000
 9555                                 ;*       2400, 3600, 4800, 7200, 9600 BAUD.
 9556                                 ;*  THEN, 9600 BAUD - TWO STOP BITS AT
 9557                                 ;*       SEVEN, SIX, FIVE BITS/PER/CHAR.
 9558                                 ;*AFTER EACH LINE HAS FINISHED ALL THE ABOVE PARAMETERS
 9559                                 ;*THE NEXT SELECTED LINE IS THE TESTED.
 9560                                              ; -$XZ ==========-=-=-=-=-=-=-=-=-
```

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 9561                                   ;:* TEST 34
  (5)                                   ;;*****************************************************************
  (4)  022464  000004                   TST34:  SCOPE
  (2)  022466  012737  000034  001122           MOV     #34,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                   ; -- END 0 MACRO ******************
  (1)  022474  012737  000002  001226           MOV     #2,$TIMES
  (2)  022502  012737  023174  001360           MOV     #TST35,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9562  022510  012737  022634  001362           MOV     #3$,LOCK        ;SET FOR LOOP
 9563  022516  005037  025242                   CLR     OFFSET          ;RESET THIS VARIABLE
 9564  022522  005037  001372                   CLR     SAVLIN          ;RESET LINE NUMBER INDICATOR
 9565  022526  005037  001374                   CLR     XMTLIN          ;USE THIS WORD TO TELL WHAT LINE TRANSMITTED
 9566  022532  012737  000001  001216           MOV     #1,$TMPO        ;USE $TMPO AS A BIT POINTER
 9567  022540  012737  010070  023172           MOV     #RCVON!S50!EIGHT!TWOSTOP,7$ ;BUILD TEMPORARY PARAMETERS
 9568  022546  033737  001216  001364  1$:      BIT     $TMPO,LINE      ;IS THIS LINE ACTIVE?
 9569  022554  001027                           BNE     3$              ;IF SO, GO GET STARTED
 9570  022556  012737  010070  023172  2$:      MOV     #RCVON!S50!EIGHT!TWOSTOP,7$ ;LOAD PARAMETERS TEMPORARILY
 9571  022564  012700  001422                   MOV     #TDO,R0         ;POINT TO THE DATA AREA
 9572  022570  005020                           CLR     (R0)+           ;CLEAR A DATA WORD
 9573  022572  022700  001462                   CMP     #STOP,R0        ;FINISHED ?
 9574  022576  001374                           BNE     .-6             ;NO
 9575  022600  005237  001374                   INC     XMTLIN          ;POINT TO THE NEXT LINE TO TRANSMIT
 9576  022604  042737  000007  023172           BIC     #7,7$           ;MAKE SURE TEMPORARY PARAMETERS POINT TO 0
 9577  022612  053737  001374  023172           BIS     XMTLIN,7$       ;ADD DESIRED LINE NUMBER
 9578  022620  005037  025242                   CLR     OFFSET
 9579  022624  106337  001216                   ASLB    $TMPO           ;POINT TO THE NEXT LINE
 9580  022630  103346                           BCC     1$              ;PROCESS THE NEXT LINE
 9581  022632  104400                           ADVANCE                 ;TEST TO SEE IF THIS TEST GETS REPEATED
 9582  022634                         3$:
  (1)                                                                   ; -$MRESET-**************************
  (1)  022634  104417                           DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (1)                                   ; -- END 0 MACRO ******************
 9583  022636  042737  010000  023172           BIC     #RCVON,7$       ;ZERO PARAMTERS FOR TX LINE
 9584  022644  013777  023172  157200           MOV     7$,@DZLPR       ;LOAD PARAMTERS FOR TX
 9585  022652  005737  001370                   TST     MODE            ;STAGGERED?
 9586  022656  100011                           BPL     100$            ;BR IF NO
 9587  022660  000241                           CLC                     ;SET UP LINE
 9588  022662  006037  023172                   ROR     7$              ;
 9589  022666  103002                           BCC     98$             ;BR IF LINE WAS EVEN
 9590  022670  000241                           CLC                     ;PREPARE TO MKE LINE EVEN
 9591  022672  000401                           BR      99$             ;CONTINUE
 9592  022674  000261                 98$:      SEC                     ;PREPARE TO MAKE LINE ODD
 9593  022676  006137  023172         99$:      ROL     7$              ;SET ALTERED LINE
 9594  022702  052737  010000  023172 100$:     BIS     #RCVON,7$       ;SET RX ON
 9595  022710  013777  023172  157134           MOV     7$,@DZLPR       ;LOAD RX PARAMETERS
 9596  022716  013737  023172  001372           MOV     7$,SAVLIN       ;ADJUST LOCATION FOR ERROR PRINTOUT
 9597  022724  042737  177770  001372           BIC     #^C<7>,SAVLIN   ;STRIP JUNK
 9598  022732  042737  000007  023172           BIC     #7,7$           ;CLEAR OLD LINE #
 9599  022740  053737  001374  023172           BIS     XMTLIN,7$       ;SET LINE UP AGAIN
 9600  022746  013737  023172  001400           MOV     7$,REGIST       ;SAVE PARAMETERS FOR PRINTOUT
 9601  022754  012700  001422                   MOV     #TDO,R0         ;POINT TO THE DATA AREA
 9602  022760  005020                           CLR     (R0)+           ;CLEAR A DATA WORD
 9603  022762  022700  001462                   CMP     #STOP,R0        ;FINISHED ?
 9604  022766  001374                           BNE     .-6             ;NO
 9605  022770  005002                           CLR     R2              ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
 9606  022772  005003                           CLR     R3              ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
 9607  022774  005037  001220                   CLR     $TMP1           ;INITIALIZE THE TIMER
```

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 9608  023000  005037  001224                    CLR     $TMP3           ;INITIALIZE THESE BITS ALSO
 9609  023004  012737  000020  001376            MOV     #20,XMTCNT      ;SET HOW MANY CHARACTERS TO TRANSMIT
 9610  023012  012777  024664  157054            MOV     #XMTSRV,@DZTIV
 9611  023020  012777  025030  157044            MOV     #RXISR1,@DZRIV
 9612  023026  013777  030334  157040            MOV     DZPRT,@DZRIS
 9613  023034  013777  030334  157036            MOV     DZPRT,@DZTIS
 9614  023042  113777  001216  157006            MOVB    $TMP0,@DZTCR    ;START THE VALID LINE
 9615  023050  052777  040140  156764            BIS     #TIE!RIE!MSENAB,@DZCSR
 9616  023056  106427  000000                    MTPS    #0              ;LOWER THE PRIORITY TO ALLOW INTERRUPTS
 9617  023062  032777  000100  156752  4$:       BIT     #RIE,@DZCSR     ;IS ROUTINE DONE?
 9618  023070  001407                            BEQ     5$              ;WHEN ALL IS DONE RX IE IS CLEARED IN ISR.
 9619  023072  005237  001220                    INC     $TMP1           ;COUNT TIME
 9620  023076  001371                            BNE     4$              ;CONTINUE TEST
 9621  023100  105237  001224                    INCB    $TMP3           ;DOUBLE COUNT
 9622  023104  001366                            BNE     4$              ;CONTINUE TEST
 9623  023106  104011                            ERROR   11              ;INTERRUPTS NOT FINISHED
 9624  023110  004737  007642            5$:     JSR     PC,SERV.G       ;<^G>?
 9625  023114  104401                            SCOP1                   ;LOOP?
 9626  023116  062737  000002  025242            ADD     #2,OFFSET
 9627  023124  013700  023172                    MOV     7$,R0
 9628  023130  042700  170377                    BIC     #^C<17*400>,R0
 9629  023134  022700  007000                    CMP     #<16*400>,R0
 9630  023140  001010                            BNE     6$
 9631  023142  032737  000030  023172            BIT     #BIT4+BIT3,7$
 9632  023150  001602                            BEQ     2$
 9633  023152  162737  000010  023172            SUB     #BIT3,7$
 9634  023160  000625                            BR      3$
 9635  023162  062737  000400  023172  6$:       ADD     #400,7$
 9636  023170  000621                            BR      3$
 9637  023172  000000                    7$:     0
 9638                                            ; -$PARTST-==========================
  (2)                                            ; -$XZ-==============================
  (3)                                    ;********************** TEST 35 ******************************
  (1)                                    ;* THIS TEST VERIFIES THAT EVEN PARITY WORKS
  (1)                                    ;* FOR ALL ODD LINES SELECTED AND THAT ODD PARITY WORKS FOR ALL
  (1)                                    ;* EVEN LINES SELECTED.
  (1)                                    ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
  (1)                                    ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
  (1)                                    ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
  (1)                                    ;*YOU ARE IN "STAGGERED' MODE.
  (1)                                    ;*40(8) CHARS ARE USED FOR THIS TEST.
  (1)                                    ;*ALL SELECTED LINES WILL BE ENABLED
  (1)                                    ;*AT THE SAME TIME!
  (2)                                            ;  $XZ-==============================
  (3)                            ;:*  TEST 35
  (6)                            ;;*****************************************************************
  (5)  023174  000004            TST35:  SCOPE
  (3)  023176  012737  000035  001122            MOV     #35,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (3)                            ; -- END 0 MACRO ================
  (3)  023204  012737  023446  001360            MOV     #TST36,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  023212  005737  001370                    TST     MODE            ;IS THIS STAGGERED MODE?
  (1)  023216  100112                            BPL     6$              ;IF NOT, DON'T DO THIS TEST
  (2)                                            ; -$MRESET-=== **********************
  (2)  023220  104417                            DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
  (2)                            ; -- END 0 MACRO ========== ========
  (1)  023222  013701  001366                    MOV     PAR,R1          ;USE R1 TO BUILD PARAMETERS TO BE LOADED
```

```
   (1)  023226  042701  000200                BIC     #ODDPAR,R1      ;MAKE SURE ODD PARITY ISN'T SET
   (1)  023232  052701  000100                BIS     #PARITY,R1      ;MAKE SURE PARITY IS TURNED ON
   (1)  023236  012702  000001                MOV     #1,R2           ;USE R2 AS A LINE POINTER
   (1)  023242  030237  001364          1$:   BIT     R2,LINE         ;IS THIS A VALID LINE?
   (1)  023246  001411                        BEQ     3$              ;IF NOT, SKIP TO THE NEXT LINE
   (1)  023250  032701  000001                BIT     #BIT0,R1        ;IS THIS LINE AN ODD LINE?
   (1)  023254  001002                        BNE     2$              ;IF IT'S ODD, USE EVEN PARITY
   (1)  023256  052701  000200                BIS     #ODDPAR,R1      ;IF IT'S EVEN, USE ODD PARITY
   (1)  023262  010177  156564          2$:   MOV     R1,@DZLPR       ;LOAD THE LINE PARAMETER REGISTER
   (1)  023266  042701  000200                BIC     #ODDPAR,R1      ;SET UP THE NEXT PARITY TO EVEN
   (1)  023272  005201                  3$:   INC     R1              ;POINT TO THE NEXT LINE
   (1)  023274  106302                        ASLB    R2              ;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
   (1)  023276  103361                        BCC     1$              ;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
   (1)  023300  005037  001372                CLR     SAVLIN          ;CLEAR THE LINE NUMBER INDICATOR
   (1)  023304  005002                        CLR     R2              ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
   (1)  023306  005037  024660                CLR     COUNT0          ; ;;2-10-84 ECB REV I
   (1)  023312  005037  024662                CLR     COUNT1          ; ;;2-10-84 ECB REV I
   (1)  023316  005003                        CLR     R3              ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
   (1)  023320  012737  000040  001376        MOV     #40,XMTCNT      ;TRANSMIT A BINARY COUNT PATTERN(00 40)
   (1)  023326  012700  001422                MOV     #TDO,R0         ;POINT TO THE DATA AREA
   (1)  023332  005020                        CLR     (R0)+           ;CLEAR A DATA WORD
   (1)  023334  022700  001462                CMP     #STOP,R0        ;FINISHED ?
   (1)  023340  001374                        BNE     .-6             ;NO
   (1)  023342  005000                        CLR     R0              ;CLEAR OFFSET
   (2)                                                                ; -$INTSET-============================
   (2)  023344  012777  024664  156524        MOV     #XMTSRV,@DZTIV  ;SET UP THE TRANSMITTER INTERRUPT VECTOR
   (2)  023352  012777  024506  156512        MOV     #PARESE,@DZRIV  ;SET UP THE RECEIVER INTERRUPT VECTOR
   (2)  023360  013777  030334  156506        MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
   (2)  023366  013777  030334  156504        MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
   (2)  023374  052777  040140  156440        BIS     #RIE!TIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
   (2)                              ; -- END 0 MACRO ==================
   (1)  023402  113777  001364  156446        MOVB    LINE,@DZTCR     ;ENABLE ALL SELECTED LINES
   (1)  023410  106427  000000                MTPS    #0              ;ALLOW INTERRUPTS
   (1)  023414  032777  000100  156420  5$:   BIT     #RIE,@DZCSR     ;WHEN RX DONE; RIE WILL =0
   (1)  023422  001410                        BEQ     6$              ;BR IF ALL DONE
   (1)  023424  104414                        DELAY                   ; ;; 2-10 84 ECB REV I
   (1)  023426  005237  024660                INC     COUNT0
   (1)  023432  102770                        BVS     5$
   (1)  023434  105237  024662                INCB    COUNT1
   (1)  023440  100365                        BPL     5$
   (1)  023442  104011                        ERROR   11              ;*RX FAILED TO FINISH (INTERRUPT)
   (1)  023444  104400                  6$:   ADVANCE                 ;ADVANCE LOOP
   (1)                              ;  - END 0 MACRO ==================
  9639                                                                ; -$PARTST-============================
   (2)                                                                ; -$XZ-================================
   (3)                                  ;************************ TEST 36 ******************************
   (1)                                  ;*THIS TEST VERIFIES THAT ODD PARITY WORKS FOR ALL ODD LINES
   (1)                                  ;* SELECTED AND THAT EVEN PARITY WORKS FOR ALL EVEN LINES SELECTED
   (1)                                  ;*THE MAIN FUNCTION OF THIS TEST IS TO VERIFY
   (1)                                  ;*THAT "PE" (PARITY ERROR) CAN BE FLAGGED BY
   (1)                                  ;*THE UARTS. THIS TEST WILL NOT BE DONE UNLESS
   (1)                                  ;*YOU ARE IN "STAGGERED" MODE.
   (1)                                  ;*40(8) CHARS ARE USED FOR THIS TEST.
   (1)                                  ;*ALL SELECTED LINES WILL BE ENABLED
   (1)                                  ;*AT THE SAME TIME!
   (2)                                                                ; -$XZ ==========================
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(3)                                     ;:*  TEST 36
(6)                                     ;;*****************************************************************
(5)  023446  000004                     TST36:  SCOPE
(3)  023450  012737  000036  001122             MOV     #36,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)                                     ; -- END O MACRO ******************
(3)  023456  012737  023720  001360             MOV     #TST37,NEXT     ;POINT TO THE START OF THE NEXT TEST
(1)  023464  005737  001370                     TST     MODE            ;IS THIS STAGGERED MODE?
(1)  023470  100112                             BPL     6$              ;IF NOT, DON'T DO THIS TEST
(2)                                             ; -$MRESET-*************************
(2)  023472  104417                             DCLASM                  ;CLEAR DEVICE AND SET MAINT BIT IF I MODE
(2)                                     ; -- END O MACRO ******************
(1)  023474  013701  001366                     MOV     PAR,R1          ;USE R1 TO BUILD PARAMETERS TO BE LOADED
(1)  023500  042701  000200                     BIC     #ODDPAR,R1      ;MAKE SURE ODD PARITY ISN'T SET
(1)  023504  052701  000100                     BIS     #PARITY,R1      ;MAKE SURE PARITY IS TURNED ON
(1)  023510  012702  000001                     MOV     #1,R2           ;USE R2 AS A LINE POINTER
(1)  023514  030237  001364             1$:     BIT     R2,LINE         ;IS THIS A VALID LINE?
(1)  023520  001411                             BEQ     3$              ;IF NOT, SKIP TO THE NEXT LINE
(1)  023522  032701  000001                     BIT     #BIT0,R1        ;IS THIS LINE AN ODD LINE?
(1)  023526  001402                             BEQ     2$              ;IF IT'S EVEN, USE EVEN PARITY
(1)  023530  052701  000200                     BIS     #ODDPAR,R1      ;IF IT'S ODD, USE ODD PARITY
(1)  023534  010177  156312             2$:     MOV     R1,@DZLPR       ;LOAD THE LINE PARAMETER REGISTER
(1)  023540  042701  000200                     BIC     #ODDPAR,R1      ;SET UP THE NEXT PARITY TO EVEN
(1)  023544  005201                     3$:     INC     R1              ;POINT TO THE NEXT LINE
(1)  023546  106302                             ASLB    R2              ;MOVE THE BIT POINTER IN R2 TO THE NEXT LINE
(1)  023550  103361                             BCC     1$              ;IF WE'RE NOT DONE, GO CHECK THE NEXT LINE
(1)  023552  005037  001372                     CLR     SAVLIN          ;CLEAR THE LINE NUMBER INDICATOR
(1)  023556  005002                             CLR     R2              ;USE R2 TO COUNT TOTAL NUMBER OF TRANSMISSIONS
(1)  023560  005037  024660                     CLR     COUNTO          ; ;;2-10-84 ECB REV I
(1)  023564  005037  024662                     CLR     COUNT1          ; ;;2 10-84 ECB REV I
(1)  023570  005003                             CLR     R3              ;USE R3 TO COUNT TOTAL NUMBER OF RECEPTIONS
(1)  023572  012737  000040  001376             MOV     #40,XMTCNT      ;TRANSMIT A BINARY COUNT PATTERN(00-40)
(1)  023600  012700  001422                     MOV     #TDO,R0         ;POINT TO THE DATA AREA
(1)  023604  005020                             CLR     (R0)+           ;CLEAR A DATA WORD
(1)  023606  022700  001462                     CMP     #STOP,R0        ;FINISHED ?
(1)  023612  001374                             BNE     .-6             ;NO
(1)  023614  005000                             CLR     R0              ;CLEAR OFFSET
(2)                                             ; -$INTSET-*************************
(2)  023616  012777  024664  156252             MOV     #XMTSRV,@DZTIV  ;SET UP THE TRANSMITTER INTERRUPT VECTOR
(2)  023624  012777  024506  156240             MOV     #PARESE,@DZRIV  ;SET UP THE RECEIVER INTERRUPT VECTOR
(2)  023632  013777  030334  156234             MOV     DZPRT,@DZRIS    ;SET THE INTERRUPT VECTOR STATUS
(2)  023640  013777  030334  156232             MOV     DZPRT,@DZTIS    ;SET TRANSMITTER INTERRUPT PRIORITY
(2)  023646  052777  040140  156166             BIS     #RIE!TIE!MSENAB,@DZCSR ;ENABLE THE DEVICE
(2)                                     ;  - END O MACRO ******************
(1)  023654  113777  001364  156174             MOVB    LINE,@DZTCR     ;ENABLE ALL SELECTED LINES
(1)  023662  106427  000000                     MTPS    #0              ;ALLOW INTERRUPTS
(1)  023666  032777  000100  156146     5$:     BIT     #RIE,@DZCSR     ;WHEN RX DONE; RIE WILL =0
(1)  023674  001410                             BEQ     6$              ;BR IF ALL DONE
(1)  023676  104414                             DELAY                   ; ;; 2-10-84 ECB REV I
(1)  023700  005237  024660                     INC     COUNTO
(1)  023704  102770                             BVS     5$
(1)  023706  105237  024662                     INCB    COUNT1
(1)  023712  100365                             BPL     5$
(1)  023714  104011                             ERROR   11              ;*RX FAILED TO FINISH (INTERRUPT)
(1)  023716  104400                     6$:     ADVANCE                 ;ADVANCE LOOP
(1)                                     ; -- END O MACRO ******************
```

```
 9641                                                   ; -$XZ-============================
  (2)                                          ;************************ TEST 37 ********************************
 9642                                          ;*
 9643                                          ;* ECB  21-FEB-84
 9644                                          ;* BAUD RATE TIMING TEST.  THIS TEST ADDED IN ORDER TO TEST CRYSTAL
 9645                                          ;* SPEEDS.  IT LOOKS FOR EITHER A KW11L OR KW11P.  IF EITHER IS AVAIL.
 9646                                          ;* THEN THE TEST IS RAN.  IF NEITHER AVAILABLE, THEN TEST IS NOT RAN.
 9647                                          ;*
 9648                                          ;* KR   18-JUN-84
 9649                                          ;* ADDED NUMBERS IN TTABLE AND NOW TEST ALL LINES AT ALL BAUD RATES
 9650                                          ;* INSTEAD OF JUST LINE 0 AT ALL BAUD RATES.
 9651                                          ;*
 9652                                                   ; -$XZ-============================
 9653                                     ;:*  TEST 37
  (5)                                     ;;*****************************************************************
  (4)  023720  000004                     TST37:  SCOPE
  (2)  023722  012737  000037  001122             MOV     #37,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)                                     ; -  END 0 MACRO ==================
  (1)  023730  012737  004712  001360             MOV     #$EOP,NEXT      ;POINT TO THE END-OF-PASS HANDLER
 9654
 9655  023736  032777  000040  155214             BIT     #BIT5, @SWR     ;RUN THIS TEST?
 9656  023744  001001                             BNE     1$              ; BRANCH IF YES
 9657  023746  104400                             ADVANCE                 ; OTHERWISE, BYE
 9658  023750                                  1$:
 9659  023750  106427  000000                   MTPS    #0              ;DROP PRIORITY TO 0
 9660  023754  013700  000004                   MOV     @#4,R0          ;SAVE CONTENTS OF LOCATION 4.
 9661  023760  012737  024024  000004           MOV     #10$,@#4        ;SET TO TRAP IF NOT KW11L
 9662  023766  012701  177546                   MOV     #177546,R1      ;GET KW11L ADDRESS.
 9663  023772  012737  024100  000100           MOV     #CLKSRV,@#100   ;SET FOR INTERRUPT.
 9664  024000  012737  000340  000102           MOV     #340,@#102      ;PRORITY 7 ON INTERRUPT.
 9665  024006  005037  024110                   CLR     BCOUNT          ;OUR OWN CLOCK TICK COUNTER
 9666  024012  005037  024106                   CLR     CCOUNT          ;CHAR SENT COUNTER
 9667  024016  012711  000100                   MOV     #100,(R1)       ;THIS WILL CAUSE A BOMB TO OCCUR IF
 9668                                                                   ;THE KW11L DOES NOT EXIST
 9669                                                                   ;BUT IF ITS THERE, THEN WE'RE STARTED.
 9670  024022  000473                             BR      TCCONT          ;START TEST
 9671
 9672  024024  022626                          10$:    CMP     (SP)+,(SP)+     ;READJUST STACK
 9673  024026  012737  024070  000004                   MOV     #20$,@#4        ;SET TO TRAP IF NO KW11P
 9674  024034  012737  024100  000104                   MOV     #CLKSRV,@#104   ;SET FOR INTERRUPT.
 9675  024042  012737  000340  000106                   MOV     #340,@#106      ;PROITY 7 ON INTERRUPT.
 9676  024050  012701  172540                          MOV     #172540,R1      ;KW11P ADDRESS.
 9677  024054  012761  177777  000002                   MOV     #-1,2(R1)       ;SET THE # OF COUNTS FOR INTERRUPT (1)
 9678                                                                           ;NOTE, IF KW11P DOES NOT EXIST, THEN
 9679                                                                           ;WE WILL BOMB FROM THIS PLACE.
 9680  024062  012711  000133                          MOV     #133,(R1)       ;SET INTERRUPT ENABLE,UP COUNT,REPEATED
 9681                                                                           ;INTERRUPT,LF CLOCK, AND RUN.
 9682  024066  000451                             BR      TCCONT          ;START TEST.
 9683
 9684  024070  022626                          20$:    CMP     (SP)+,(SP)+     ;READJUST STACK, NO CLOCKS AT ALL!
 9685  024072  010037  000004                   MOV     R0,@#4          ;RESTORE LOCATION 4
 9686  024076  104400                          ADVANCE                 ;GET OUT.
 9687
 9688  024100  005237  024106          CLKSRV: INC     CCOUNT          ;CLOCK INTERRUPTS TO HERE, UPDATE COUNT.
 9689  024104  000002                          RTI                     ;THEN EXIT.
 9690
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 9691  024106  000000                  CCOUNT: .WORD   0               ;INCREMENTED BY CLKSRV. @CLOCK TICKS.
 9692  024110  000000                  BCOUNT: .WORD   0               ;USED BY TCCONT AS TIMER.
 9693  024112  000000                  DCOUNT: .WORD   0               ;USED BY TCCONT AS TIMER.
 9694  024114  000000                  ECOUNT: .WORD   0               ;USED BY ERROR REPORTING.
 9695                                  ;+
 9696                                  ; THESE NUMBER WHERE WORKING GREAT ON A PDP-11/24 RUNNING AT 60 HERTZ
 9697                                  ;
 9698                                  ;TTABLE:.WORD   5., 7.          ;COUNT OF CHARS OUT FOR 50 BAUD
 9699                                  ;       .WORD   7., 9.          ;COUNT OF CHARS OUT FOR 75 BAUD
 9700                                  ;       .WORD   11., 13.        ;COUNT OF CHARS OUT FOR 110 BAUD
 9701                                  ;       .WORD   13., 15.        ;COUNT OF CHARS OUT FOR 134.5 BAUD
 9702                                  ;       .WORD   15., 17.        ;COUNT OF CHARS OUT FOR 150 BAUD
 9703                                  ;
 9704                                  ;       .WORD   29., 32.        ;COUNT OF CHARS OUT FOR 300 BAUD
 9705                                  ;       .WORD   59., 62.        ;COUNT OF CHARS OUT FOR 600 BAUD
 9706                                  ;       .WORD   119., 122.      ;COUNT OF CHARS OUT FOR 1200 BAUD
 9707                                  ;       .WORD   179., 182.      ;COUNT OF CHARS OUT FOR 1800 BAUD
 9708                                  ;       .WORD   199., 202.      ;COUNT OF CHARS OUT FOR 2000 BAUD
 9709                                  ;
 9710                                  ;       .WORD   239., 242.      ;COUNT OF CHARS OUT FOR 2400 BAUD
 9711                                  ;       .WORD   359., 362.      ;COUNT OF CHARS OUT FOR 3600 BAUD
 9712                                  ;       .WORD   479., 482.      ;COUNT OF CHARS OUT FOR 4800 BAUD
 9713                                  ;       .WORD   719., 722.      ;COUNT OF CHARS OUT FOR 7200 BAUD
 9714                                  ;       .WORD   959., 962.      ;COUNT OF CHARS OUT FOR 9600 BAUD
 9715                                  ;-
 9716
 9717                                  ;+
 9718                                  ; THESE NUMBER WHERE MODIFIED SO THEY WOULD WORK ON A
 9719                                  ; 50 HERTZ MACHINE (TESTED ON PDP-11/70) AS WELL AS 60 HERTZ.
 9720                                  ; AT 9600 BAUD THERE IS ABOUT 17% ERROR.
 9721                                  ; THE LOWER THE BAUD RATE THE LESS THE ERROR.
 9722                                  ;
 9723                                  ; THIS TABLE WAS REDONE TO INCLUDE THE 2% ALLOWABLE ERROR RATE, PLUS THE
 9724                                  ; POSSIBILITY OF AN INCOMPLETE TICK AT THE START OF THE TIMING.
 9725                                  ;-
 9726
 9727  024116  000005  000007          TTABLE: .WORD   5., 7.          ;COUNT OF CHARS OUT FOR 50 BAUD
 9728  024122  000007  000014                  .WORD   7., 12.         ;COUNT OF CHARS OUT FOR 75 BAUD
 9729  024126  000013  000021                  .WORD   11., 17.        ;COUNT OF CHARS OUT FOR 110 BAUD
 9730  024132  000014  000024                  .WORD   12., 20.        ;COUNT OF CHARS OUT FOR 134.5 BAUD
 9731  024136  000016  000025                  .WORD   14., 21.        ;COUNT OF CHARS OUT FOR 150 BAUD
 9732
 9733  024142  000035  000050                  .WORD   29., 40.        ;COUNT OF CHARS OUT FOR 300 BAUD
 9734  024146  000072  000114                  .WORD   58., 76.        ;COUNT OF CHARS OUT FOR 600 BAUD
 9735  024152  000164  000224                  .WORD   116., 148.      ;COUNT OF CHARS OUT FOR 1200 BAUD
 9736  024156  000255  000334                  .WORD   173., 220.      ;COUNT OF CHARS OUT FOR 1800 BAUD
 9737  024162  000300  000364                  .WORD   192., 244.      ;COUNT OF CHARS OUT FOR 2000 BAUD
 9738
 9739  024166  000347  000444                  .WORD   231., 292.      ;COUNT OF CHARS OUT FOR 2400 BAUD
 9740  024172  000533  000664                  .WORD   347., 436.      ;COUNT OF CHARS OUT FOR 3600 BAUD
 9741  024176  000716  001104                  .WORD   462., 580.      ;COUNT OF CHARS OUT FOR 4800 BAUD
 9742  024202  001265  001544                  .WORD   693., 868.      ;COUNT OF CHARS OUT FOR 7200 BAUD
 9743  024206  001635  002204                  .WORD   925., 1156.     ;COUNT OF CHARS OUT FOR 9600 BAUD
 9744          024212          ENDTTB  =.                              ;END OF TTABLE
 9745
 9746                                  ;
```

```
 9747                                   ; CHECK OUT THE CLOCK
 9748                                   ;
 9749
 9750  024212  010037  000004          TCCONT: MOV     R0,@#4          ;RESTORE LOCATION 4.
 9751  024216  005037  024106                  CLR     CCOUNT          ;START WITH LINE CLOCK AT ZERO COUNT
 9752  024222  012737  177750  024110          MOV     #-30,BCOUNT     ;30-18MS LOOPS TO WAIT
 9753
 9754  024230  005737  024106          10$:    TST     CCOUNT          ;WAIT FOR COUNT TO GO TO 1 TO AVOID
 9755  024234  001010                          BNE     20$             ;USING THAT DANGEROUS FIRST COUNT!
 9756  024236  005237  024112                  INC     DCOUNT          ;BUT AS A SAFE GUARD,
 9757  024242  001372                          BNE     10$             ;DON'T HANG HERE
 9758  024244  005237  024110                  INC     BCOUNT
 9759  024250  001367                          BNE     10$
 9760  024252  005011                          CLR     (R1)            ;CLEAR CLOCK
 9761  024254  104400                          ADVANCE                 ;CLOCK NOT WORKING RIGHT- ABORT TEST
 9762                                                                  ;NOT THE FAULT OF THE DZ!
 9763
 9764                                   ;
 9765                                   ; START XMITTING CHARACTERS TO ALL 8 LINES AT ALL BAUD RATES.
 9766                                   ; IF THE NUMBER OF CHARACTERS TRANSMITTED IS BETWEEN THE
 9767                                   ; TWO NUMBERS IN TTABLE THEN THE LINE IS OK, ELSE ERROR
 9768                                   ;
 9769
 9770  024256  012777  000050  155556  20$:     MOV     #50,@DZCSR      ;SET MSE AND MAINT.
 9771  024264  012700  000030                  MOV     #30,R0          ;SET BAUD RATE 50, 8 BIT CHAR LEN
 9772  024270  012703  000001                  MOV     #1,R3           ;HOLDS CURRENT LINE, START AT LINE 0
 9773
 9774  024274  110377  155556          30$:    MOVB    R3,@DZTCR       ;ENABLE THE NEXT LINE TO XMIT
 9775  024300  012702  024116                  MOV     #TTABLE,R2      ;GET TABLE OF EXPECTED RESULTS
 9776
 9777  024304  010077  155542          40$:    MOV     R0,@DZLPR       ;UPDATE THE BAUD RATE AND NEXT LINE
 9778  024310  005037  024110                  CLR     BCOUNT          ;REUSE TIMER AS XMIT CHAR COUNTER
 9779  024314  005037  024106                  CLR     CCOUNT          ;CLEAR CLOCK INTERRUPT COUNTER
 9780
 9781  024320  022737  000074  024106  50$:    CMP     #60.,CCOUNT     ;LOOP FOR 60 CLOCK TICKS
 9782  024326  001413                          BEQ     60$             ;EXIT WHEN THAT OCCURS.
 9783  024330  005777  155506                  TST     @DZCSR          ;READY TO XMIT A CHAR?
 9784  024334  100371                          BPL     50$             ;NO, THEN WAIT
 9785  024336  112777  000101  155522          MOVB    #101,@DZTDR     ;XMIT A CHAR
 9786  024344  005237  024110                  INC     BCOUNT          ;UPDATE XMIT COUNT, SHOULD NOT OVERFLOW.
 9787  024350  102363                          BVC     50$             ;IF NO OVERFLOW, CONTINUE
 9788  024352  005011                          CLR     (R1)            ;IF OVERFLOW, CLOCK COULD BE BAD, CLEAR IT
 9789  024354  104400                          ADVANCE                 ;ABORT THIS TEST IF CLOCK 10-2.'
 9790
 9791  024356  005037  024106          60$:    CLR     CCOUNT
 9792  024362  022737  000074  024106          CMP     #60.,CCOUNT     ;LOOP FOR 60 CLOCK TICKS
 9793  024370  001403                          BEQ     65$             ;EXIT WHEN THAT OCCURS.
 9794  024372  005777  155444                  TST     @DZCSR          ; WAIT FOR LAST CHARACTER TO GO
 9795  024376  100367                          BPL     60$             ; SPIN IF NOT DONE
 9796  024400  023712  024110          65$:    CMP     BCOUNT,(R2)     ;IF COUNT < LOW
 9797  024404  103422                          BLO     70$             ;       THEN ERROR
 9798  024406  023762  024110  000002          CMP     BCOUNT,2(R2)    ;IF COUNT > HI
 9799  024414  101016                          BHI     70$             ;       THEN ERROR
 9800  024416  062700  000400                  ADD     #400,R0         ;NEXT BAUD RATE
 9801  024422  062702  000004                  ADD     #4,R2           ;GET NEXT PAIR OF NUMBERS
 9802  024426  022702  024212                  CMP     #ENDTTB,R2      ;HIT END OF TTABLE?
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 9803  024432  001324                          BNE     40$             ;NO, CONTINUE TESTING ,HIS LINE
 9804  024434  042700  007400                  BIC     #7400,R0        ;BRING THE BAUD RATE BACK TO 50
 9805  024440  005200                          INC     R0              ;AND GET NEXT LINE NUMBER
 9806  024442  106303                          ASLB    R3              ;MOVE ONTO THE NEXT LINE
 9807  024444  103313                          BCC     30$             ;IF NOT DONE WITH ALL LINES THEN CONTINUE
 9808  024446  005011                          CLR     (R1)            ;ELSE STOP CLOCK
 9809  024450  104400                          ADVANCE                 ;AND DO THE NEXT TEST
 9810
 9811                                  ;
 9812                                  ; ERROR - COUNTER NOT IN THE RANGE OF THE NUMBERS IN TTABLE
 9813                                  ;
 9814
 9815  024452  005011                  70$:    CLR     (R1)            ;STOP CLOCK.
 9816  024454  011237  024114                  MOV     (R2),ECOUNT     ;MOVE LOW COUNT FOR ERROR MESSAGE
 9817  024460  016237  000002  024112          MOV     2(R2),DCOUNT    ;MOVE HIGH COUNT FOR ERROR MESSAGE
 9818  024466  042700  177770                  BIC     #^C<7>,R0       ;STRIP EVERYTHING BUT LINE NUMBER
 9819  024472  010037  001372                  MOV     R0,SAVLIN       ;MOVE LINE NUMBER FOR ERROR MESSAGE
 9820  024476  104030                          ERROR   30              ;COUNT TOO HIGH OR LOW
 9821  024500  004737  007642                  JSR     PC,SERV.G       ;<^G?>
 9822  024504  104400                          ADVANCE                 ;DO NEXT TEST
 9823
 9824                                  ;
 9825                                  ;RECEIVER SERVICE ROUTINE(PARITY TEST ONLY)
 9826                                  ;
 9827
 9828  024506  017704  155334          PARESE: MOV     @DZRBUF,R4      ;GET THE CHARACTER
 9829  024512  010401                          MOV     R4,R1           ;COPY THE RECEIVED INFORMATION
 9830  024514  000301                          SWAB    R1              ;GET THE LINE NUMBER IN THE LOWER BYTE
 9831  024516  042701  177770                  BIC     #^C<7>,R1       ;ISOLATE THE LINE NUMBER
 9832  024522  010137  001372                  MOV     R1,SAVLIN       ;FILL LOC. FOR ERROR PRINTOUT
 9833  024526  005704                          TST     R4              ;WAS DATA VALID?
 9834  024530  100401                          BMI     10$             ;BRANCH IF YES
 9835  024532  104023                          ERROR   23              ;ERROR - DATA VALID NOT SET!
 9836  024534  006301                  10$:    ASL     R1              ;ALIGN IT ON A WORD BOUNDARY
 9837  024536  032704  010000                  BIT     #PARER,R4       ;PARITY ERROR SHOULD BE SET. IS IT?
 9838  024542  001013                          BNE     11$             ;IF SO, GO CHECK CHARACTER
 9839  024544  013737  002046  001400          MOV     DZRBUF,REGIST   ;SET UP FOR THE ERROR MESSAGE
 9840  024552  010405                          MOV     R4,R5
 9841  024554  042705  000377                  BIC     #377,R5
 9842  024560  156105  001442                  BISB    TR0(R1),R5      ;GET THE CORRECT CHARACTER
 9843  024564  052705  110000                  BIS     #DVALID!PARER,R5 ;BUILD WHAT WAS EXPECTED
 9844  024570  104006                          ERROR   6               ;*ERROR- DID NOT GET CORRECT INFORMATION
 9845  024572  126104  001442          11$:    CMPB    TR0(R1),R4      ;CHECK THE CHARACTER. IS IT CORRECT?
 9846  024576  001407                          BEQ     12$             ;IF SO, GO SET UP NEXT CHARACTER
 9847  024600  116105  001442                  MOVB    TR0(R1),R5      ;LOAD THE CHARACTER FOR ERROR REPORTING
 9848  024604  042705  177400                  BIC     #^C<377>,R5     ;CLEAR SIGN EXTEND
 9849  024610  042704  177400                  BIC     #^C<377>,R4     ;REMOVE THE JUNK FROM R4, THE ACTUAL CHARACTER
 9850  024614  104005                          ERROR   5               ;DATA ERROR
 9851  024616  005261  001442          12$:    INC     TR0(R1)         ;SET UP THE NEXT CHARACTER
 9852  024622  005203                          INC     R3              ;ADD TO THE TOTAL RECEIVED COUNT
 9853  024624  005037  024660                  CLR     COUNT0          ;RESET COUNTERS TO NEXT
 9854  024630  005037  024662                  CLR     COUNT1          ;RECIEVER INTERRUPT
 9855  024634  032777  040000  155200          BIT     #TIE,@DZCSR     ;ARE TRANSMISSIONS DONE?
 9856  024642  001005                          BNE     13$             ;IF NO, GO RECEIVE SOME MORE
 9857  024644  020203                          CMP     R2,R3           ;ARE ALL CHARACTERS RECEIVED?
 9858  024646  001003                          BNE     13$             ;IF NO, GO RECEIVE SOME MORE
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 9859  024650  042777  000100  155164          BIC     #RIE,@DZCSR     ;DISABLE RECEIVER INTERRUPTS
 9860  024656  000002                  13$:     RTI                     ;GO BACK TO RECEIVER WAIT LOOP
 9861  024660  000000                  COUNT0:  0
 9862  024662  000000                  COUNT1:  0
 9863
 9864
 9865                                  ;TRANSMITTER INTERRUPT SERVICE
 9866                                  ;-----------------------------
 9867
 9868  024664  117701  155154          XMTSRV:  MOVB    @#DZCSR,R1     ;GET THE LINE NUMBER. IS THE TRANSMITTER
 9869  024670  100411                           BMI     1$              ;REALLY READY? IF SO, GO LOAD THE CHARACTER
 9870  024672  013700  001372                   MOV     SAVLIN,R0       ;ADJUST LOCATION SAVLIN
 9871  024676  042701  177770                   BIC     #^C<7>,R1       ;ISOLATE THE LINE NUMBER
 9872  024702  010137  001372                   MOV     R1,SAVLIN       ;FOR ERROR PRINTOUT
 9873  024706  104003                           ERROR   3               ;*TRANSMITTER NOT READY- FALSE INTERRUPT
 9874  024710  010037  001372                   MOV     R0,SAVLIN       ;RESET SAVLIN TO PREVIOUS VALUE
 9875  024714  042701  177770          1$:      BIC     #^C<7>,R1       ;ISOLATE THE LINE NUMBER
 9876  024720  006301                           ASL     R1              ;MAKE SURE IT REFERENCES A WORD BOUNDARY
 9877  024722  116177  001422  155136           MOVB    TDO(R1),@DZTDR  ;LOAD THE CURRENT CHARACTER FOR THIS LINE
 9878  024730  005261  001422                   INC     TDO(R1)         ;SET UP NEXT CHARACTER FOR THIS LINE
 9879                                  ;*****************************************************************
 9880                                                                                  ;(REV. F0: DELETED  INC
 9881                                  ;*****************************************************************
 9882  024734  023761  001376  001422           CMP     XMTCNT,TDO(R1)  ;HAVE WE DONE ALL PATTERNS ON THIS LINE?
 9883  024742  001015                           BNE     4$              ;IF NOT, KEEP ON TRANSMITTING
 9884  024744  012700  000001                   MOV     #1,R0           ;SET UP A DESELECTION POINTER
 9885  024750  006201                           ASR     R1              ;GET THE LINE NUMBER AGAIN
 9886  024752  005301                  2$:      DEC     R1              ;REDUCE THE COUNT. WAS THIS THE LINE?
 9887  024754  100402                           BMI     3$              ;IF SO, GO DISABLE THE ENABLE BIT FOR IT
 9888  024756  006300                           ASL     R0              ;MOVE THE POINTER TO THE NEXT LINE
 9889  024760  000774                           BR      2$              ;GO CHECK THE NEXT LINE
 9890  024762  140077  155070          3$:      BICB    R0,@DZTCR       ;DISABLE THE LINE POINTED TO BY R0
 9891  024766  001003                           BNE     4$              ;IF MORE LINES ARE ACTIVE , GO CONTINUE TRANSMIT
 9892  024770  042777  040000  155044           BIC     #TIE,@DZCSR     ;IF NOT, DISABLE TRANSMITTER INTERRUPTS
 9893                                  ;*****************************************************************
 9894  024776  005202                  4$:      INC     R2              ;UP THE NUMBER OF TRANSMISSIONS         (REV. F0)
 9895                                  ;*****************************************************************
 9896  025000  000002                           RTI                     ;RETURN TO THE TIMING LOOP
 9897
 9898                                  ; RELATIVE TIME BUILDING ROUTINE
 9899                                  ; ------------ ---------------
 9900
 9901  025002  012737  000004  001222  BUILD:   MOV     #4,$TMP2        ;ROTATE 4 BITS BACK INTO $TMP1
 9902  025010  006037  001224          1$:      ROR     $TMP3           ;GET THE BITS FROM $TMP3, THE HIGH BYTE
 9903  025014  006037  001220                   ROR     $TMP1           ;OF THE RELATIVE TIME COUNTER. PUT THEM BACK
 9904  025020  005337  001222                   DEC     $TMP2           ;INTO $TMP1 USING THE CARRY BIT WITH
 9905                                                                  ;ROTATE INSTRUCTIONS
 9906  025024  001371                           BNE     1$              ;REDUCE COUNT. ALL BITS BACK? IF NOT, GET MORE
 9907  025026  000207                           RTS     PC              ;RETURN TO CALLING TEST
 9908
```

```
9910                                        ;RECEIVER SERVICE ROUTINE
9911
9912  025030  105777  155006        RXISR1: TSTB    @DZCSR          ;IS THE RECEIVER REALLY READY?
9913  025034  100401                        BMI     1$              ;IF SO, GO SERVICE IT
9914  025036  104004                        ERROR   4               ;*ERROR- RECEIVER DONE FLAG ISN'T SET
9915  025040  017704  155002          1$:   MOV     @DZRBUF,R4      ;SAVE THE RECEIVER INFORMATION
9916  025044  100401                        BMI     2$              ;IF IT WAS VALID, GO PROCESS IT
9917  025046  104023                        ERROR   23              ;ERROR  DATA VALID WASN'T SET
9918  025050  032704  070000          2$:   BIT     #OVRRUN!FRMERR!PARER,R4 ;ARE ANY ERROR FLAGS SET?
9919  025054  001403                        BEQ     3$              ;IF NOT, GO CONTINUE PROCESSING
9920  025056  013700  002046                MOV     DZRBUF,R0       ;SET UP FOR ERROR REPORTING
9921  025062  104002                        ERROR   2               ;ERROR- RECEIVER ERROR FLAG SET
9922  025064  010401                  3$:   MOV     R4,R1           ;COPY THE RECEIVER INFORMATION
9923  025066  000301                        SWAB    R1              ;GET THE LINE NUMBER IN THE LOWER BYTE
9924  025070  042701  177770                BIC     #^C<7>,R1       ;ISOLATE THE LINE NUMBER
9925  025074  006301                        ASL     R1              ;ALIGN IT ON A WORD BOUNDARY
9926  025076  120461  001442                CMPB    R4,TRO(R1)      ;IS THE CHARACTER WHAT IT SHOULD BE?
9927  025102  001413                        BEQ     4$              ;IF SO,GO CONTINUE PROCESSING
9928  025104  116105  001442                MOVB    TRO(R1),R5      ;GET WHAT WAS EXPECTED FOR ERROR REPORTING
9929  025110  042705  177400                BIC     #^C<377>,R5     ;ELIMINATE PROPAGATED SIGN
9930  025114  042704  177400                BIC     #^C<377>,R4     ;ISOLATE THE ACTUAL CHARACTER
9931  025120  010137  001372                MOV     R1,SAVLIN       ;GET THE LINE NUMBER OF THE RECEIVER ERROR
9932  025124  006237  001372                ASR     SAVLIN          ;ALIGN IT CORRECTLY FOR REPORTING
9933  025130  104005                        ERROR   5               ;*DATA ERROR
9934  025132  005261  001442          4$:   INC     TRO(R1)         ;SET UP THE NEXT EXPECTED CHARACTER
9935  025136  005203                        INC     R3              ;INCREMENT THE COUNT OF RECEIVED CHARACTERS
9936  025140  032761  000020  001442        BIT     #20,TRO(R1)     ;HAVE ALL CHARACTERS BEEN RECEIVED?
9937  025146  001402                        BEQ     5$              ;IF NOT, GO RECEIVE SOME MORE
9938  025150  020203                        CMP     R2,R3           ;HAVE WE RECEIVED ALL CHARACTERS?
9939  025152  001401                        BEQ     6$              ;IF SO,GO DETERMINE THE TIMING
9940  025154  000002                  5$:   RTI                     ;GO CONTINUE TIMING AND ALLOW INTERRUPTS
9941  025156  004737  025002          6$:   JSR     PC,BUILD        ;GET THE RELATIVE TIME (SIGNIFICANT BITS)
9942
9943  025162  013700  025242                MOV     OFFSET,R0       ;GET POINTER
9944  025166  013760  001220  002102        MOV     $TMP1,TMTBL(R0) ; SAVE THIS TEST'S TIME
9945  025174  005737  025242                TST     OFFSET          ;FIRST TEST?
9946  025200  001414                        BEQ     7$              ;IF NOT, GO CHECK THE TIME
9947  025202  005740                        TST     -(R0)           ;POINT TO THE PREVIOUS  TIME TAKEN
9948  025204  026037  002102  001220        CMP     TMTBL(R0),$TMP1 ;IS THIS TIME WHAT IT SHOULD BE?
9949  025212  101007                        BHI     7$              ;IF SO, GO TO THE NEXT TEST
9950  025214  016005  002102                MOV     TMTBL(R0),R5    ;PLACE WHAT WAS EXPECTED IN R5
9951  025220  010137  001372                MOV     R1,SAVLIN       ;GET THE LINE NUMBER OF THE RECEIVER
9952  025224  006237  001372                ASR     SAVLIN          ;MAKE SURE IT'S THE LINE NUMBER
9953  025230  104021                        ERROR   21              ;TIMING ERROR
9954  025232  042777  000140  154602  7$:   BIC     #RIE!MSE!AB,@DZCSR ;DISABLE THE DEVICE
9955  025240  000002                        RTI                     ;RETURN TO THE PROGRAM
9956  025242  000000              OFFSET: 0
```

```
 9958
 9959                                   ;DZ11 ECHO/CABLE TEST
 9960
 9961                                           ;*STARTING PROCEDURE
 9962                                           ;*LOAD PROGRAM
 9963                                           ;*LOAD ADDRESS 000210
 9964                                           ;*PRESS START
 9965                                           ;*PROGRAM WILL TYPE DZ11 ECHO/CABLE TEST
 9966                                           ;*PROGRAM WILL TYPE  WHICH TEST- ECHO OR CABLE
 9967                                           ;*TYPE IN  E  OR  C   RESPECTIVELY
 9968                                           ;*PROGRAM WILL TYPE 'VECTOR ADDRESS-"
 9969                                           ;*TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
 9970                                           ;*FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
 9971                                           ;*PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
 9972                                           ;*TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
 9973                                           ;*FOR THE DZ11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
 9974                                           ;*PROGRAM WILL TYPE "LINE NUMBER-'
 9975                                           ;*TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
 9976                                           ;*,FOLLOWED BY <CARRIAGE RETURN>
 9977                                           ;*PROGRAM WILL TYPE "BAUD RATE-"
 9978                                           ;*TYPE IN THE BAUD RATE OF THE DZ11 TERMINAL
 9979                                           ;*,FOLLOWED BY <CARRIAGE RETURN>
 9980                                                   ;*THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
 9981                                           ;*              50
 9982                                           ;*              75
 9983                                           ;*              110
 9984                                           ;*              135     (ROUNDED OFF   134.5)
 9985                                           ;*              150
 9986                                           ;*              300
 9987                                           ;*              600
 9988                                           ;*              1200
 9989                                           ;*              1800
 9990                                           ;*              2000
 9991                                           ;*              2400
 9992                                           ;*              3600
 9993                                           ;*              4800
 9994                                           ;*              7200
 9995                                           ;*              9600
 9996                                           ;*ALL OTHERS ARE REJECTED
 9997
 9998                                           ;*PROGRAM WILL TYPE "ECHO"  OR  "CABLE TEST" TO INDICATE THAT TESTING HAS STARTE
10002
10003
10004                                          ;PROGRAM INITIALIZATION
10005                                          ;LOCK OUT INTERRUPTS
10006                                          ;SET UP PROCESSOR STACK
10007                                          ;SET UP POWER FAIL VECTOR
10008                                          ;CLEAR PROGRAM FLAGS AND COUNTS
10009
10010  025244  012706  001120          XSTART: MOV     #STACK,SP       ;SET UP PROCESSOR STACK
10011  025250  106427  000340                  MTPS    #PR7            ;LOCK OUT INTERRUPTS
10012  025254  012737  025244  001126          MOV     #XSTART,$LPADR  ;SET UP IN CASE OF POWER FAIL
10013  025262  005037  027440                  CLR     STFLG           ;CLEAR TEST START FLAG
10014  025266  005037  001242                  CLR     $PASS           ;CLEAR PASS COUNT
10015  025272  005037  001132                  CLR     $ERTTL          ;CLEAR ERROR COUNT
10016  025276  105037  001123                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
```

```
10017  025302  005037  027444                    CLR     LAST            ;CLEAR LAST ERROR PC
10018  025306  032777  000001  153644  VEC1:     BIT     #SW00,@SWR      ;IF SW00=1, GET NEW VECTOR
10019  025314  001465                            BEQ     OTHER           ;AND CSR
10020  025316  012701  000300          VEC2:     MOV     #300,R1
10021  025322  012702  000302                    MOV     #302,R2
10022  025326  010221                  1$:       MOV     R2,(R1)+        ;RESTORE TRAPCATCHER
10023  025330  005022                            CLR     (R2)+           ;IN FLOATING VECTOR AREA
10024  025332  022122                            CMP     (R1)+,(R2)+     ;UPDATE THE POINTERS
10025  025334  020127  001000                    CMP     R1,#1000
10026  025340  001372                            BNE     1$
10027  025342  104403                            INSTR                   ;INPUT ADDRESS OF DEVICE VECTOR
10028  025344  027472                            MVECTOR                 ;MESSAGE "VECTOR ADDRESS-"
10029  025346  104405                            PARAM                   ;CONVERT STRING TO OCTAL
10030  025350  000300                            300                     ;LOW LIMIT
10031  025352  000770                            770                     ;HIGH  LIMIT
10032  025354  002072                            DZRIV                   ;LOCATIONS TO BE FILLED
10033  025356     003                  .BYTE     3                       ;LSB MASK
10034  025357     004                  .BYTE     4                       ;NUMBER OF LOCATIONS
10035  025360  104403                            INSTR                   ;INPUT ADDRESS OF DEVICE CSR
10036  025362  027514                            MREGAD                  ;MESSAGE "CONTROL REGISTER ADDRESS "
10037  025364  104405                            PARAM                   ;CONVERT STRING TO OCTAL
10038  025366  160000                            160000                  ;LOW LIMIT
10039  025370  163700                            163700                  ;HIGH LIMIT
10040  025372  00[illegible]                     DZCSR                   ;LOCATIONS TO BE FILLED
10041  025374     007                  .BYTE     7                       ;LSB MASK
10042  025375     001                  .BYTE     1                       ;NUMBER OF LOCATIONS
10043  025376  013737  002042  002046            MOV     DZCSR,DZRBUF    ;BEGIN BUILDING DEVICE ADDRESSES
10044  025404  062737  000002  002046            ADD     #2,DZRBUF       ;FORM THE READ BUFFER ADDRESS
10045  025412  013737  002046  002052            MOV     DZRBUF,DZLPR    ;REMEMBER THAT THIS IS ALSO LINE PARAMETER REG.
10046  025420  013737  002046  002056            MOV     DZRBUF,DZTCR    ;BEGIN BUILDING TRANSMITTER CONTROL REGISTER
10047  025426  062737  000002  002056            ADD     #2,DZTCR        ;FORM THE TRANSMITTER CONTROL REGISTER POINTER
10048  025434  013737  002056  002060            MOV     DZTCR,HDZTCR
10049  025442  005237  002060                    INC     HDZTCR
10050  025446  013737  002056  002066            MOV     DZTCR,DZTDR     ;BEGIN FORMING TRANSMITTER DATA REGISTER
10051  025454  062737  000002  002066            ADD     #2,DZTDR        ;FORM THE TRANSMITTER DATA REGISTER
10052  025462  013737  002066  002062            MOV     DZTDR,DZMSR
10053  025470  032777  000002  153462  OTHER:    BIT     #SW01,@SWR      ;RESELECT OF TEST?
10054  025476  001427                            BEQ     XBEGIN          ;IF NOT, SKIP ASKING WHICH ONE
10055  025500  104403                            INSTR                   ;INPUT WHICH TEST YOU ARE RUNNING
10056  025502  027700                            MWHICH                  ;ECHO OR CABLE
10057  025504  104416                            PAWCH                   ;SET FLAG
10058  025506  027436                            WCHFLG                  ;THIS FLAG
10059  025510  104403                  BAUD:     INSTR                   ;INPUT BAUD RATE
10060  025512  027622                            MSPEED                  ;MESSAGE "BAUD RATE "
10061  025514  104415                            PARMD                   ;CONVERT DECIMAL STRING TO OCTAL
10062  025516  000062                            50.                     ;LOW LIMIT
10063  025520  022600                            9600.                   ;HIGH LIMIT
10064  025522  027454                            LINESP                  ;LOCATION TO BE FILLED
10065  025524     000                  .BYTE     0                       ;LSB MASK
10066  025525     001                  .BYTE     1                       ;NUMBER OF LOCATIONS
10067  025526  104413                  LINEX:    DEVICE.CLR              ;CLEAR DEVICE
10068  025530  005037  027440                    CLR     STFLG           ;CLEAR PROGRAM START FLAG
10069  025534  104403                            INSTR                   ;INPUT LINE NUMBER
10070  025536  027612                            MLINE                   ;MESSAGE "LINE NUMBER "
10071  025540  104405                            PARAM                   ;CONVERT  STRING TO OCTAL
10072  025542  000000                            0                       ;LOW LIMIT
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10073  025544  000007                          7                       ;HIGH LIMIT
10074  025546  001372                          SAVLIN                  ;LOCATION TO BE FILLED
10075  025550     000                .BYTE     0                       ;LSB MASK
10076  025551     001                          .BYTE   1               ;NUMBER OF LOCATIONS
10077  025552  004537  027242                  JSR     R5,SET
10078
10079  025556  106427  000340        XBEGIN:  MTPS    #PR7            ;LOCK OUT INTERRUPTS
10080  025562  012706  001120                 MOV     #STACK,SP       ;SET UP PROCESSOR STACK
10081  025566  005037  027442                 CLR     LOCKUP          ;CLEAR TIMEOUT
10082  025572  005737  027436                 TST     WCHFLG          ;ECHO OR CABLE TEST ?
10083  025576  001413                         BEQ     2$              ;ECHO
10084  025600  012737  026314  001126         MOV     #TEST2,$LPADR   ;CABLE TEST
10085  025606  005737  027440                 TST     STFLG           ;ARE YOU LOOPING ?
10086  025612  001017                         BNE     1$              ;YES
10087  025614  005137  027440                 COM     STFLG           ;NO
10088  025620  104402  027773                 TYPE    ,MCABLE         ;TYPE CABLE TEST
10089  025624  000412                         BR      1$
10090  025626  012737  025656  001126  2$:    MOV     #TEST1,$LPADR   ;SET UP ECHO TEST
10091  025634  005737  027440                 TST     STFLG           ;ARE YOU LOOPING ?
10092  025640  001004                         BNE     1$              ;YES
10093  025642  005137  027440                 COM     STFLG           ;NO
10094  025646  104402  027746                 TYPE    ,MTERM          ;TYPE ECHO TEST
10095  025652  000177  153250          1$:    JMP     @$LPADR         ;START TESTING
10096                                         ;THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
10097                                         ;(IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER,
10098                                         ;ONE LINE AT A TIME, ANY LINE 0 THRU 7 (OCTAL)
10099
10100  025656  104413          TEST1:  DEVICE.CLR               ;CLEAR DZ11
10101  025660  012737  000001  001122          MOV     #1,$TSTNM
10102  025666  013777  027462  154162          MOV     NUMTCR,@DZTCR   ;SET TCR BIT
10103  025674  013737  027460  001366          MOV     NUMLIN,PAR      ;SET PARAMETERS
10104  025702  053737  027456  001366          BIS     SPEED,PAR       ;SET BAUD RATE
10105  025710  013777  001366  154134          MOV     PAR,@DZLPR      ;LOAD PARAM.
10106  025716  012777  000040  154116          MOV     #MSENAB,@DZCSR  ;SET SCANN ENABLE
10107  025724  005004                          CLR     R4
10108  025726  012705  030010                  MOV     #MQUICK,R5      ;SET MESSAGE BUFFER
10109  025732  005777  154104          3$:     TST     @DZCSR          ;TRDY?
10110  025736  100404                          BMI     2$              ;BR IF YES
10111  025740  104414                          DELAY                   ;WAIT
10112  025742  005304                          DEC     R4              ;
10113  025744  001372                          BNE     3$              ;
10114  025746  104003                          ERROR   3               ;NO TRDY SET! WHY?
10115  025750  005004                  2$:     CLR     R4              ;RESET COUNTER TO 0
10116  025752  112577  154110                  MOVB    (R5)+,@DZTDR    ;LOAD CHAR
10117  025756  001365                          BNE     3$              ;
10118  025760  004737  007642                  JSR     PC,SERV.G       ;<^G>?
10119  025764  122777  000377  153166          CMPB    #377,@SWR       ;RE-DO QUICK BROWN?
10120  025772  001731                          BEQ     TEST1           ;BR IF REPEAT PATTERN
10121  025774  104413                  DEVICE.CLR
10122  025776  106427  000340                  MTPS    #PR7            ;LOCK OUT INTERRUPTS
10123  026002  012737  026752  001360          MOV     #XEOP,NEXT
10124  026010  104413                  DEVICE.CLR
10125  026012  013737  027460  001366          MOV     NUMLIN,PAR      ;SELECT LINE # & SET INTERRUPT ENABLE
10126  026020  053737  027456  001366          BIS     SPEED,PAR       ;SET LINE SPEED AND
10127                                                                  ;CHARACTER LENGTH (TRANS. & REC.)
10128  026026  052737  010000  001366          BIS     #RCVON,PAR      ;MAKE SURE RECEIVER IS TURNED ON
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10129  026034  013777  001366  154010          MOV     PAR,@DZLPR      ;LOAD THE LINE PARAMETER REGISTER
10130  026042  012777  026116  154022          MOV     #INTSVC,@DZRIV  ;SET UP INTERRUPT SERVICE
10131  026050  013777  027464  154016          MOV     PRIO,@DZRIS     ;AND LEVEL
10132  026056  106437  030336                  MTPS    @#LESS1         ;ALLOW INTERRUPTS
10133  026062  012777  000140  153752          MOV     #RIE!MSENAB,@DZCSR ;SET RECEIVER INTERRUPT ENABLE
10134  026070  104402  027640                  TYPE    ,MCHAR          ;TYPE "ANY CHARACTER"
10135  026074  105777  153064          1$:     TSTB    @$TKS           ;IF SOMBODY HITS A KEY- GET NEW LINE #
10136  026100  100375                          BPL     1$              ;LOOP HERE
10137  026102  005777  153060                  TST     @$TKB           ;CLEAR CHAR
10138  026106  004737  007642                  JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
10139  026112  000137  025526                  JMP     LINEX           ;
10140
10141
10142                                          ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
10143  026116  105777  153720          INTSVC: TSTB    @DZCSR          ;TEST REC. FLAG
10144  026122  100401                          BMI     .+4
10145  026124  104004                          ERROR   4               ;ERROR - INTERRUPT NOT CAUSED BY FLAG
10146  026126  017737  153714  027466          MOV     @DZRBUF,RECDAT
10147  026134  100401                          BMI     .+4
10148  026136  104023                          ERROR   23              ;NON- VALID CHARACTER
10149  026140  032737  020000  027466          BIT     #BIT13,RECDAT   ;CHECK FOR FRAMING ERROR
10150  026146  001401                          BEQ     .+4             ;BR IF NO ERROR
10151  026150  104025                          ERROR   25              ;EITHER SOMBODY HIT THE
10152                                                                  ;"BREAK KEY" OR YOU HAVE AN ERROR!
10153  026152  113737  027466  027470          MOVB    RECDAT,TBUF     ;MOVE CHARACTER TO OUTPUT AREA
10154  026160  113737  027466  011262          MOVB    RECDAT,INBUF    ;MOVE CHARACTER TO CHECK FOR ^C
10155  026166  042737  177600  011262          BIC     #^C<177>,INBUF  ;STRIP JUNK PLUS PARITY
10156  026174  042737  174377  027466          BIC     #174377,RECDAT  ;SAVE ONLY LINE  NUMBER
10157  026202  000337  027466                  SWAB    RECDAT
10158  026206  023737  001372  027466          CMP     SAVLIN,RECDAT   ;DOES THE LINE # COMPARE?
10159  026214  001401                          BEQ     .+4
10160  026216  104015                          ERROR   15              ;*WRONG LINE NUMBER
10161  026220  012777  000040  153614          MOV     #MSENAB,@DZCSR  ;START THE TRANSMITTERS SCANNER
10162  026226  123727  011262  000003          CMPB    INBUF,#3                ;IS IT A ^C ?
10163  026234  001004                          BNE     1$              ;NO
10164  026236  104413                          DEVICE.CLR
10165  026240  012716  026752                  MOV     #XEOP,(SP)      ;CRUNCH STACK
10166  026244  000002                          RTI
10167  026246  005003                  1$:     CLR     R3              ;INITIALIZE DELAY
10168  026250  013777  027462  153600          MOV     NUMTCR,@DZTCR   ;ENABLE THE LINE
10169  026256  005777  153560          10$:    TST     @DZCSR          ;TRANSMITTER READY?
10170  026262  100403                          BMI     2$              ;IF YES BRANCH
10171  026264  005203                          INC     R3              ;INCREMENT DELAY
10172  026266  001373                          BNE     10$             ;DELAY DONE?
10173  025270  104003                          ERROR   3               ;TRANSMIT READY NOT SET!
10174  026272  113777  027470  153566  2$:     MOVB    TBUF,@DZTDR     ;TRANSMIT THE CHARACTER
10175  026300  012777  000140  153534          MOV     #RIE!MSENAB,@DZCSR      ;RESTART THE RECEIVER
10176  026306  005077  153544                  CLR     @DZTCR          ;CLEAR TCR BIT
10177  026312  000002                          RTI
10178
10179
10180                                  ;THIS TEST TRANSMITS A BINARY COUNT PATTERN
10181                                  ;VIA INTERRUPT MODE TO THE RECEIVER
10182                                  ;...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
10183  026314  106427  000340          TEST2:  MTPS    #PR7            ;DISABLE INTERRUPTS
10184  026320  012737  000002  001122          MOV     #2,$TSTNM
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10185  026326  012737  026752  001360          MOV     #XEOP,NEXT
10186  026334  104413                          DEVICE.CLR              ;
10187                                          ;*TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
10188                                          ;*WILL BRING UP "CO" AND  RING' FOR THE SAME LINE
10189                                          ;*THE DIST PNL MUST HAVE JUMPER FROM DTR TO RQST TO SEND
10190                                          ;*IN ORDER FOR THIS TEST TO WORK!
10191  026336  012737  026344  001362          MOV     #1$,LOCK        ;LOOP
10192  026344  113777  027462  153506  1$:     MOVB    NUMTCR,@HDZTCR  ;SET DTR
10193  026352  005005                          CLR     R5              ;
10194  026354  153705  027462                  BISB    NUMTCR,R5       ;BUILD EXPECTED
10195  026360  000305                          SWAB    R5              ;PUT IN HIGH BYTE
10196  026362  153705  027462                  BISB    NUMTCR,R5       ;
10197  026366  104414                          DELAY                   ;WAIT FOR CABLE DELAY
10198  026370  017704  153466                  MOV     @DZMSP,R4       ;READY MODEM BITS
10199  026374  020504                          CMP     R5,R4           ;ARE THEY OK?
10200  026376  001401                          BEQ     2$              ;BR IF YES
10201  026400  104022                          ERROR   22              ;IS THE TEST CONNECTOR ON?
10202                                                                  ;HAS RIGHT LINE BEEN SELECTED?
10203                                                                  ;IF SO- YOU HAVE A PROBLEM!
10204                                                                  ;MODEM BITS NOT RIGHT
10205  026402  104401                  2$:     SCOP1                   ;LOOP
10206  026404  104413                  3$:     DEVICE.CLR              ;INIT DZ11
10207  026406  013737  027456  001366          MOV     SPEED,PAR       ;SET LINE SPEED
10208  026414  053737  027460  001366          BIS     NUMLIN,PAR      ;SELECT LINE # & REC.  INTERRUPT ENABLE
10209  026422  052737  010000  001366          BIS     #RCVON,PAR      ;ENABLE THE RECEIVER FOR THIS LINE
10210  026430  052777  040140  153404          BIS     #TIE!RIE!MSENAB,@DZCSR ;SET TRANSMITTER INTERRUPT ENABLE
10211  026436  012777  026552  153426          MOV     #INTREC,@DZRIV  ;SET UP INTR SERVICE
10212  026444  013777  027464  153422          MOV     PRIO,@DZRIS     ;SET UP LEVEL
10213  026452  012777  026732  153416          MOV     #INTRAN,@DZTIV  ;SET UP INTR SERVICE
10214  026460  013777  027464  153412          MOV     PRIO,@DZTIS     ;SET UP LEVEL
10215  026466  005001                          CLR     R1              ;RX DATA POINTER- SET TO 0
10216  026470  005002                          CLR     R2              ;TX DATA POINTER- SET TO 0
10217  026472  013777  001366  153352          MOV     PAR,@DZLPR      ;SET THE PARAMETERS AND TURN ON RECEIVER
10218  026500  106437  030336                  MTPS    @#LESS1         ;ALLOW INTERRUPTS
10219  026504  013777  027462  153344          MOV     NUMTCR,@DZTCR   ;SET UP TCR BIT
10220
10221                                          ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
10222  026512  105777  152446          SPIN:   TSTB    @$TKS           ;IF SOMEBODY HITS A KEY- GET A NEW LINE #
10223  026516  100006                          BPL     1$              ;BR IF NO KEY HIT
10224  026520  005777  152442                  TST     @$TKB           ;CLEAR CHAR
10225  026524  004737  007642                  JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
10226  026530  000137  025526                  JMP     LINEX           ;SW02=1
10227  026534  005237  027442          1$:     INC     LOCKUP          ;INC TIMEOUT FLAG
10228  026540  001364                          BNE     SPIN            ;IF NOT 0  RETURN SPINNING
10229  026542  104011                          ERROR   11              ;*RECEIVER FAILED TO INTERRUPT  CHECK CABLE/TERMINATOR
10230  026544  104413                  QUITS:  DEVICE.CLR
10231  026546  000137  026752                  JMP     XEOP            ;CALL FOR END OF PASS
10232  026552  005037  027442          INTREC: CLR     LOCKUP          ;CLEAR TIMEOUT FLAG
10233  026556  105777  153260                  TSTB    @DZCSR          ;TEST REC DONE
10234  026562  100401                          BMI     .+4             ;YES
10235  026564  104004                          ERROR   4               ;*FALSE INTERRUPT
10236  026566  017737  153254  027466          MOV     @DZRBUF,RECDAT  ;SAVE WORD
10237  026574  100401                          BMI     .+4
10238  026576  104023                          ERROR   23              ;*NON VALID CHARACTER
10239  026600  032737  040000  027466          BIT     #BIT14,RECDAT   ;DATA OVERRUN ?
10240  026606  001401                          BEQ     .+4             ;NO
```

```
10241  026610  104024                          ERROR   24                  ;*YES
10242  026612  032737  020000  027466          BIT     #BIT13,RECDAT       ;FRAMING ERROR ?
10243  026620  001401                          BEQ     .+4                 ;NO
10244  026622  104025                          ERROR   25                  ;*YES
10245  026624  032737  010000  027466          BIT     #BIT12,RECDAT       ;PARITY ERROR ?
10246  026632  001401                          BEQ     .+4                 ;NO
10247  026634  104026                          ERROR   26                  ;*YES
10248  026636  110105                          MOVB    R1,R5               ;SET EXPECTED
10249  026640  042705  177400                  BIC     #^C<377>,R5         ;CLEAR HIGH BYTE
10250  026644  113704  027466                  MOVB    RECDAT,R4           ;GET FOUND
10251  026650  042704  177400                  BIC     #^C<377>,R4         ;CLEAR HIGH BYTE
10252  026654  020504                          CMP     R5,R4    ;OK?
10253  026656  001401                          BEQ     .+4
10254  026660  104005                          ERROR   5                   ;DATA ERROR
10255  026662  042737  174377  027466          BIC     #174377,RECDAT      ;SAVE ONLY LINE NUMBER
10256  026670  000337  027466                  SWAB    RECDAT
10257  026674  023737  001372  027466          CMP     SAVLIN,RECDAT       ;DOES THE LINE # COMPARE ?
10258  026702  001401                          BEQ     .+4                 ;YES
10259  026704  104015                          ERROR   15                  ;*WRONG LINE #
10260  026706  120127  000377                  CMPB    R1,#377             ;LAST CHARACTER ?
10261  026712  001003                          BNE     1$                  ;NO
10262  026714  012716  026544                  MOV     #QUITS,(SP)         ;CRUNCH STACK
10263  026720  000403                          BR      2$
10264  026722  105201                  1$:     INCB    R1                  ;UPDATE EXPECTED DATA
10265  026724  012716  026512                  MOV     #SPIN,(SP)          ;CRUNCH STACK
10266  026730  000002                  2$:     RTI
10267
10268  026732  005777  153104          INTRAN: TST     @DZCSR  ;TEST TRANSMIT FLAG
10269  026736  100401                          BMI     .+4
10270  026740  104003                          ERROR   3                   ;*FALSE INTERRUPT
10271  026742  110277  153120                  MOVB    R2,@DZTDR           ;TRANSMIT A CHARACTER
10272  026746  105202                          INCB    R2                  ;UPDATE TX DATA
10273  026750  000002                          RTI     ;RETURN
```

```
10275
10276                                   ;END OF PASS
10277                                   ;RESTART TEST
10278
10279  026752  104402          XEOP:    TYPE                    ;TYPE NAME OF TEST
10280  026754  027550                   MPASS
10281  026756  005037  027444           CLR     LAST            ;CLEAR LAST ERROR PC
10282  026762  105037  001123           CLRB    $ERFLG          ;CLEAR ERROR FLAG
10283  026766  000137  025556  RSTRT:   JMP     XBEGIN
10284
10285                                   ;CONVERT DECIMAL ASCII STRING TO OCTAL
10286  026772  011605          .PARMD:  MOV     (SP),R5
10287  026774  012537  027156           MOV     (R5)+,6$
10288  027000  012537  027160           MOV     (R5)+,7$
10289  027004  012537  027162           MOV     (R5)+,8$
10290  027010  112537  027164           MOVB    (R5)+,9$
10291  027014  112537  027165           MOVB    (R5)+,10$
10292  027020  010516                   MOV     R5,(SP)
10293  027022  005005          2$:      CLR     R5
10294  027024  012704  011262           MOV     #INBUF,R4
10295  027030  122714  000015           CMPB    #15,(R4)
10296  027034  001424                   BEQ     3$
10297  027036  121427  000060          1$:      CMPB    (R4),#'0
10298  027042  002421                   BLT     3$
10299  027044  121427  000071           CMPB    (R4),#'9
10300  027050  003016                   BGT     3$
10301  027052  142714  000060           BICB    #'0,(R4)
10302  027056  005002                   CLR     R2
10303  027060  152402                   BISB    (R4)+,R2
10304  027062  060205                   ADD     R2,R5
10305  027064  122714  000015           CMPB    #15,(R4)
10306  027070  001410                   BEQ     4$
10307  027072  006305                   ASL     R5      ;X2
10308  027074  010502                   MOV     R5,R2   ;SAVE X2
10309  027076  006305                   ASL     R5      ;X4
10310  027100  006305                   ASL     R5      ;X8
10311  027102  060205                   ADD     R2,R5   ;TIMES 10
10312  027104  000754                   BR      1$
10313  027106  104404          3$:      INSTER
10314  027110  000744                   BR      2$
10315
10316                                   ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
10317
10318  027112  020537  027160  4$:      CMP     R5,7$
10319  027116  101373                   BHI     3$
10320  027120  020537  027156           CMP     R5,6$
10321  027124  103770                   BLO     3$.
10322  027126  133705  027164           BITB    9$,R5
10323  027132  001365                   BNE     3$
10324
10325                                   ;STORE NUMBER AT SPECIFIED ADDRESS
10326
10327  027134  013704  027162           MOV     8$,R4
10328  027140  010524          5$:      MOV     R5,(R4)+
10329  027142  062705  000002           ADD     #2,R5
10330  027146  105337  027165           DECB    10$
```

```
10331  027152  001372                        BNE     5$
10332  027154  000002                        RTI
10333  027156  000000                6$:     0
10334  027160  000000                7$:     0
10335  027162  000000                8$:     0
10336  027164     000                9$:     .BYTE 0
10337  027165     000                10$:    .BYTE 0
10338
10339
10340                                        ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
10341                                        ;BUFFER TO THE CHARACTERS "E" AND "C".
10342                                        ;IF THE CHARACTER IS "E" CLEAR THE FLAG
10343                                        ;IF THE CHARACTER IS "C" SET THE FLAG
10344
10345  027166  017605  000000          .PAWCH:MOV      @(SP),R5
10346  027172  142737  000040  011262        BICB    #40,INBUF       ;SET FOR LOWER CASE INPUT
10347  027200  122737  000105  011262        CMPB    #'E,INBUF       ;IS IT "E" ?
10348  027206  001002                        BNE     1$
10349  027210  105015                        CLRB    (R5)            ;000
10350  027212  000406                        BR      2$
10351  027214  122737  000103  011262  1$:   CMPB    #'C,INBUF       ;IS IT "C" ?
10352  027222  001005                        BNE     3$
10353  027224  112715  177777                MOVB    #-1,(R5)        ;3177
10354  027230  062716  000002          2$:   ADD     #2,(SP)
10355  027234  000002                        RTI
10356  027236  104404                3$:     INSTER                  ;RETRY
10357  027240  000752                        BR      .PAWCH
10358
10359
10360
10361                                        ;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
10362                                        ;LINE NUMBER (SAVLIN) FOR DZLPR, DZTCR AND DZCSR
10363                                        ;REGISTER USAGE.
10364
10365  027242  013737  001372  027460  SET:    MOV     SAVLIN,NUMLIN   ;SAVE SAVLIN
10366  027250  013700  001372          XTCR0:  MOV     SAVLIN,R0       ;COPY THE LINE NUMBER FOR LOOP CONTROL
10367  027254  005037  027462                  CLR     NUMTCR          ;SET A DEFAULT OF LINE 0 OR NO LINES
10368  027260  012702  000001                  MOV     #1,R2           ;SET A BIT POINTER TO THE FIRST LINE
10369  027264  005300                XTCR1:  DEC     R0              ;REDUCE THE INDICATOR.IS IT MINUS YET?
10370  027266  100402                        BMI     SET1            ;IF SO, R2 POINTS TO THE RIGHT LINE
10371  027270  006302                        ASL     R2              ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
10372  027272  000774                        BR      XTCR1           ;GO SEE IF THIS LINE IS THE ONE
10373  027274  012701  027336          SET1:   MOV     #TABLE2,R1
10374  027300  010237  027462                  MOV     R2,NUMTCR       ;COPY THE CORRECT BIT POINTER
10375  027304  022137  027454          1$:     CMP     (R1)+,LINESP
10376  027310  001407                        BEQ     2$
10377  027312  005721                        TST     (R1)+           ;IS IT THE END OF TABLE?
10378  027314  001373                        BNE     1$              ;NO
10379  027316  104402  027564                TYPE    ,MINVAL         ;INVALID BAUD RATE,BEGIN AGAIN
10380  027322  012705  025510                MOV     #BAUD,R5        ;JUMP TO BAUD THRU R5
10381  027326  000402                        BR      3$
10382  027330  011137  027456          2$:   MOV     (R1),SPEED      ;SET UP BAUD RATE
10383  027334  000205                3$:     RTS     R5
10384
10385
10386
```

```
10387                                   ;THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)
10388  027336  000062           TABLE2: .WORD   50.             ;50 BAUD
10389  027340  010070                   .WORD   10070           ;
10390  027342  000113                   .WORD   75.             ;75 BAUD
10391  027344  010470                   .WORD   10470           ;
10392  027346  000156                   .WORD   110.            ;110 BAUD
10393  027350  011070                   .WORD   11070           ;TWO STOP BITS
10394  027352  000207                   .WORD   135.            ;134.5 BAUD
10395  027354  011470                   .WORD   11470           ;TWO STOP BITS
10396  027356  000226                   .WORD   150.            ;150 BAUD
10397  027360  012070                   .WORD   12070           ;TWO STOP BITS
10398  027362  000454                   .WORD   300.            ;300 BAUD
10399  027364  012430                   .WORD   12430           ;ONE STOP BIT
10400  027366  001130                   .WORD   600.            ;600 BAUD
10401  027370  013030                   .WORD   13030           ;ONE STOP BIT
10402  027372  002260                   .WORD   1200.           ;1200 BAUD
10403  027374  013430                   .WORD   13430           ;ONE STOP BIT
10404  027376  003410                   .WORD   1800.           ;1800 BAUD
10405  027400  014030                   .WORD   14030           ;ONE STOP BIT
10406  027402  003720                   .WORD   2000.           ;2000 BAUD
10407  027404  014430                   .WORD   14430           ;ONE STOP BIT
10408  027406  004540                   .WORD   2400.           ;2400 BAUD
10409  027410  015030                   .WORD   15030           ;ONE STOP BIT
10410  027412  007020                   .WORD   3600.           ;3600 BAUD
10411  027414  015430                   .WORD   15430           ;ONE STOP BIT
10412  027416  011300                   .WORD   4800.           ;4800 BAUD
10413  027420  016030                   .WORD   16030           ;ONE STOP BIT
10414  027422  016040                   .WORD   7200.           ;7200 BAUD
10415  027424  016430                   .WORD   16430           ;ONE STOP BIT
10416  027426  022600                   .WORD   9600.           ;9600 BAUD
10417  027430  017070                   .WORD   17070           ;
10418  027432  177777  000000           .WORD   -1,0            ;TABLE TERMINATOR
10419
10420
10421  027436  000000           WCHFLG:0                        ;ECHO OR CABLE FLAG
10422  027440  000000           STFLG: 0                        ;PROGRAM START FLAG
10423  027442  000000           LOCKUP: 0                       ;TIMEOUT FLAG
10424  027444  000000           LAST:   0                       ;LAST ERROR PC
10425  027446  000000           TDATA:  0
10426  027450  000000           RDATA:  0
10427  027452  000000           BYTCNT: 0
10428  027454  000156           LINESP: 110.                    ;DEFAULT BAUD RATE
10429  027456  006307           SPEED:  6307                    ;DEFAULT 110 BAUD, 8 BITS/CHAR,
10430                                                           ;FDX, 2 STOP BITS
10431  027460  000100           NUMLIN: 100                     ;DEFAULT VALUE, REC. INTERRUPT ENABLED
10432
10433  027462  000001           NUMTCR: 1                       ;DEFAULT VALUE,TCR BIT 0
10434  027464  000240           PRIO:   240                     ;DEFAULT DEVICE PRIORITY 5
10435  027466  000000           RECDAT: 0
10436  027470  000000           TBUF:   0
10440  027472  053200  041505  047524  MVECTO: .ASCIZ  <200>/VECTOR ADDRESS- /
10441  027514  041600  047117  051124  MREGAD: .ASCIZ  <200>/CONTROL REGISTER ADDRESS- /
10442  027550  050200  051501  020123  MPASS:  .ASCIZ  <200>/PASS DONE./
10443  027564  044600  053116  046101  MINVAL: .ASCIZ  <200>/INVALID BAUD RATE - /
10444  027612  046200  047111  035105  MLINE:  .ASCIZ  <200>/LINE: /
10445  027622  041200  052501  020104  MSPEED: .ASCIZ  <200>/BAUD RATE - /
```

```
10446  027640  052200  050131  020105  MCHAR:  .ASCIZ  <200>/TYPE A CHAR. ON DZ11 TERMINAL /
10447  027700  053600  044510  044103  MWHICH: .ASCIZ  <200>/WHICH TEST ? ECHO OR CABLE (E OR C) /
10448  027746  052200  051105  044515  MTERM:  .ASCIZ  <200>/TERMINAL ECHO TEST /
10449  027773     200  040503  046102  MCABLE: .ASCIZ  <200>/CABLE TEST /
10450  030010  006777  177777  177412  MQUICK: .ASCII  <377><15><377><377><12><377><377>
10451  030017     124  042510  050440          .ASCII  /THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789/
10452  030114  006777  177777  177412          .ASCII  <377><15><377><377><12><377><377><377><0>
10453          030126                  .EVEN
10457                                  ;;*****************************************************************
10458                                          ;UTILITIES
10459                                  ;;*****************************************************************
10460
10461
10462  030126  006337  030334          DZLEV:  ASL     DZPRT           ;BUILD PRIORITY IN THIS LOCATION
10463  030132  006337  030334                  ASL     DZPRT           ;USING ARITHMETIC SHIFTS, ROTATE
10464  030136  006337  030334                  ASL     DZPRT           ;       THE PRIORITY LEVEL PAST
10465  030142  006337  030334                  ASL     DZPRT           ;       THE BIT POSITIONS CORRE-
10466  030146  006337  030334                  ASL     DZPRT           ;       SPONDING TO THE CONDITION CODES
10467  030152  013737  030334  030336          MOV     DZPRT,LESS1     ;MOVE THIS TO LESS1
10468  030160  162737  000001  030336          SUB     #1,LESS1        ;CREATE THE NEXT LOWEST PRIORITY
10469  030166  042737  000037  030336          BIC     #37,LESS1       ;INSURE THAT THE  TNZVC BITS ARE CLEAR
10470  030174  013700  002072                  MOV     DZRIV,R0        ;PLACE THE BASE VECTOR ADDRESS IN R0
10471  030200  062700  000002                  ADD     #2,R0           ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
10472  030204  010037  002074                  MOV     R0,DZRIS        ;STORE IT HERE
10473  030210  062700  000002                  ADD     #2,R0           ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
10474  030214  010037  002076                  MOV     R0,DZTIV        ;STORE IT HERE
10475  030220  062700  000002                  ADD     #2,R0           ;CALCULATE THE TRANSMITTER VECTOR STATUS ADDRESS
10476  030224  010037  002100                  MOV     R0,DZTIS        ;STORE IT HERE
10477
10478                                  ;THIS SEGMENT SETS UP POINTERS FOR THE GIVEN DZ11. $BASE IS THE BASE ADDRESS
10479                                  ;OF THE DEVICE
10480  030230  013700  001310                  MOV     $BASE,R0        ;COPY THE ADDRESS BEING LOADED
10481  030234  010037  002042                  MOV     R0,DZCSR        ;XXX0
10482  030240  005200                          INC     R0
10483  030242  010037  002044                  MOV     R0,HDZCSR       ;XXX1
10484  030246  005200                          INC     R0
10485  030250  010037  002046                  MOV     R0,DZRBUF       ;XXX2
10486  030254  010037  002052                  MOV     R0,DZLPR        ;XXX2
10487  030260  005200                          INC     R0
10488  030262  010037  002050                  MOV     R0,HDZRBUF      ;XXX3
10489  030266  010037  002054                  MOV     R0,HDZLPR       ;XXX3
10490  030272  005200                          INC     R0
10491  030274  010037  002056                  MOV     R0,DZTCR        ;XXX4
10492  030300  005200                          INC     R0
10493  030302  010037  002060                  MOV     R0,HDZTCR       ;XXX5
10494  030306  005200                          INC     R0
10495  030310  010037  002062                  MOV     R0,DZMSR        ;XXX6
10496  030314  010037  002066                  MOV     R0,DZTDR        ;XXX6
10497  030320  005200                          INC     R0
10498  030322  010037  002064                  MOV     R0,HDZMSR       ;XXX7
10499  030326  010037  002070                  MOV     R0,HDZTDR       ;XXX7
10500  030332  000207                          RTS     PC
10501  030334  000240          DZPRT:  PR5
10502  030336  000200          LESS1:  PR4     ;LEVEL TO ALLOW INTERRUPTS
10503
```

```
10505                                           ;ERROR ERROR TABLE
10506  030340  000000                .ERRTAB:       0       ;ERROR 0
10507  030342  000000                               0
10508  030344  000000                               0
10509
10510  030346  030566                               EM1     ;ERROR
10511  030350  032073                               DH1
10512  030352  032324                               DT1
10513
10514  030354  030641                               EM2     ;ERROR 2
10515  030356  032116                               DH2
10516  030360  032336                               DT2
10517
10518  030362  030667                               EM3     ;ERROR 3
10519  030364  032151                               DH3
10520  030366  032354                               DT3
10521
10522  030370  030726                               EM4     ;ERROR 4
10523  030372  032151                               DH3
10524  030374  032354                               DT3
10525
10526  030376  030755                               EM5     ;ERROR 5
10527  030400  032163                               DH4
10528  030402  032362                               DT4
10529
10530  030404  031004                               EM6     ;ERROR 6
10531  030406  032163                               DH4
10532  030410  032362                               DT4
10533
10534  030412  031042                               EM7     ;ERROR 7
10535  030414  032151                               DH3
10536  030416  032354                               DT3
10537
10538  030420  031103                               EM8     ;ERROR 10
10539  030422  032151                               DH3
10540  030424  032354                               DT3
10541
10542  030426  031145                               EM9     ;ERROR 11
10543  030430  032151                               DH3
10544  030432  032354                               DT3
10545
10546  030434  031203                               EM10    ;ERROR 12
10547  030436  032151                               DH3
10548  030440  032354                               DT3
10549
10550  030442  031242                               EM13    ;ERROR 13
10551  030444  032151                               DH3
10552  030446  032354                               DT3
10553
10554  030450  031273                               EM14    ;ERROR 14
10555  030452  032151                               DH3
10556  030454  032354                               DT3
10557
10558  030456  031325                               EM15    ;ERROR 15
10559  030460  000000                               0
10560  030462  000000                               0
```

```
10561
10562  030464  031367                          EM16
10563  030466  032151                          DH3
10564  030470  032354                          DT3
10565
10566  030472  031440                          EM17    ;ERROR 17
10567  030474  032151                          DH3
10568  030476  032354                          DT3
10569
10570  030500  031476                          EM20
10571  030502  032151                        - DH3
10572  030504  032354                          DT3
10573
10574  030506  031537                          EM21    ;ERROR 21
10575  030510  032212                          DH5
10576  030512  032400                          DT5
10577
10578  030514  031567                          EM22    ;ERROR 22
10579  030516  032163                          DH4
10580  030520  032362                          DT4
10581
10582  030522  031631                          EM23    ;ERROR 23
10583  030524  032151                          DH3
10584  030526  032354                          DT3
10585
10586  030530  031661                          EM24
10587  030532  032151                          DH3
10588  030534  032354                          DT3
10589
10590  030536  031707                          EM25
10591  030540  032151                          DH3
10592  030542  032354                          DT3
10593
10594  030544  031737                          EM26
10595  030546  032151                          DH3
10596  030550  032354                          DT3
10597
10598  030552  031766                          EM27
10599  030554  032151                          DH3
10600  030556  032354                          DT3
10601
10602  030560  032036                          EM30
10603  030562  032271                          DH6
10604  030564  032422                          DT6
10605
```

```
10607
10608                                                   ;ERROR MESSAGES
10612  030566  047200  020117  046123  EM1:    .ASCIZ  <200>/NO SLAVE SYNC RESPONSE FROM DZ11 REGISTER/
10613  030641     200  042522  044507  EM2:    .ASCIZ  <200>?REGISTER R/W FAILURE?
10614  030667     200  051124  047101  EM3:    .ASCIZ  <200>/TRANSMIT READY (TRDY) NOT SET/
10615  030726  051200  041505  044505  EM4:    .ASCIZ  <200>/RECEIVER DONE NOT SET/
10616  030755     200  040504  040524  EM5:    .ASCIZ  <200>/DATA COMPARISON ERROR/
10617  031004  042200  030532  020061  EM6:    .ASCIZ  <200>/DZ11 *RECEIVER BUFFER* ERROR/
10618  031042  052200  040522  051516  EM7:    .ASCIZ  <200>/TRANSMITTER FAILED TO INTERRUPT/
10619  031103     200  047125  054105  EM8:    .ASCIZ  <200>/UNEXPECTED TRANSMITTER INTERRUPT/
10620  031145     200  042522  042503  EM9:    .ASCIZ  <200>/RECEIVER FAILED TO INTERRUPT/
10621  031203     200  047125  054105  EM10:   .ASCIZ  <200>/UNEXPECTED RECEIVER INTERRUPT/
10622  031242  051600  046111  020117  EM13:   .ASCIZ  <200>/SILO ALARM SET TOO SOON/
10623  031273     200  044523  047514  EM14:   .ASCIZ  <200>/SILO ALARM FAILED TO SET/
10624  031325     200  041501  044524  EM15:   .ASCIZ  <200>/ACTION DETECTED ON INVALID LINE./
10625  031367     200  042522  042101  EM16:   .ASCIZ  <200>/READING DZRBUF DID NOT CLEAR SILO ALARM/
10626  031440  042200  052101  020101  EM17:   .ASCIZ  <200>/DATA VALID SHOULD NOT BE SET/
10627  031476  051200  041505  044505  EM20:   .ASCIZ  <200>/RECEIVER DONE SHOULD NOT BE SET/
10628  031537     200  042522  040514  EM21:   .ASCIZ  <200>/RELATIVE TIMING ERROR./
10629  031567     200  047515  042504  EM22:   .ASCIZ  <200>/MODEM SIGNAL ERROR ON CABLE TEST/
10630  031631     200  040504  040524  EM23:   .ASCIZ  <200>/DATA VALID IS NOT SET!/
10631  031661     200  040504  040524  EM24:   .ASCIZ  <200>/DATA OVERRUN IS SET!/
10632  031707     200  051106  046501  EM25:   .ASCIZ  <200>/FRAMING ERROR OCCURRED/
10633  031737     200  040520  044522  EM26:   .ASCIZ  <200>/PARITY ERROR OCCURRED/
10634  031766  043200  046125  020114  EM27:   .ASCIZ  <200>/FULL BINARY COUNT PATTERN NOT RECEIVED/
10635  032036  041200  052501  020104  EM30:   .ASCIZ  <200>/BAUD RATE TIMING TEST ERROR/
10636  032073     200  051124  050101  DH1:    .ASCIZ  <200>/TRAP PC  DZ11 REG/
10637  032116  042600  050130  041505  DH2:    .ASCIZ  <200>/EXPECTED  FOUND  REGISTER/
10638  032151     200  044514  042516  DH3:    .ASCIZ  <200>/LINE NO./
10639  032163     200  054105  042520  DH4:    .ASCIZ  <200>/EXPECTED  FOUND  LINE/
10640  032212  052200  020130  044514  DH5:    .ASCIZ  <200>/TX LINE PREVIOUS TIME  ACTUAL TIME  PARAMETER/
10641  032271     200  044510  044107  DH6:    .ASCIZ  <200>/HIGH   LOW    COUNT  LINE/
10642                                           .EVEN
10646                                                   ;DATA TABLES FOR ERROR MESSAGES
10647  032324  000002                         DT1:    2
10648  032326     006     003                          .BYTE   6,3
10649  032330  001204                                  $REG1
10650  032332     006     001                          .BYTE   6,1
10651  032334  001202                                  $REG0
10652
10653  032336  000003                         DT2:    3
10654  032340     006     004                          .BYTE   6,4
10655  032342  001214                                  $REG5
10656  032344     006     001                          .BYTE   6,1
10657  032346  001212                                  $REG4
10658  032350     006     001                          .BYTE   6,1
10659  032352  001202                                  $REG0
10660
10661  032354  000001                         DT3:    1
10662  032356     003     001                          .BYTE   3,1
10663  032360  001372                                  SAVLIN
10664
10665  032362  000003                         DT4:    3
10666  032364     006     004                          .BYTE   6,4
10667  032366  001214                                  $REG5
10668  032370     006     001                          .BYTE   6,1
```

```
10669  032372  001212                    $REG4
10670  032374     003      001           .BYTE   3,1
10671  032376  001372                    SAVLIN
10672
10673  032400  000004            DT5:    4
10674  032402     003      005           .BYTE   3,5
10675  032404  001372                    SAVLIN
10676  032406     006      011           .BYTE   6,9.
10677  032410  001214                    $REG5
10678  032412     006      007           .BYTE   6,7
10679  032414  001220                    $TMP1
10680  032416     006      001           .BYTE   6,1
10681  032420  001400                    REGIST
10682  032422  000004            DT6:    4                       ;FOR BAUD RATE ERROR MESSAGE
10683  032424     006      001           .BYTE   6,1
10684  032426  024112                    DCOUNT                  ;HIGH COUNTER
10685  032430     006      001           .BYTE   6,1
10686  032432  024114                    ECOUNT                  ;LOW COUNTER
10687  032434     006      001           .BYTE   6,1
10688  032436  024110                    BCOUNT                  ;ACTUAL XMIT COUNT
10689  032440     001      001           .BYTE   1,1
10690  032442  001372                    SAVLIN                  ;THE LINE NUMBER ERROR OCCURED ON
10691
10699                                   ;TABLE OF DELAY TIMES FOR INDIVIDUAL BAUD RATES
10700                                   ;--  ---------------- ------------ --- ----
10701
10702  032444  002450            DLYTBL: 2450                    ;TIME FOR   50 BAUD
10703  032446  001560                    1560                    ;TIME FOR   75 BAUD
10704  032450  001120                    1120                    ;TIME FOR  110 BAUD
10705  032452  000750                     750                    ;TIME FOR  134 BAUD
10706  032454  000660                     660                    ;TIME FOR  150 BAUD
10707  032456  000330                     330                    ;TIME FOR  300 BAUD
10708  032460  000150                     150                    ;TIME FOR  600 BAUD
10709  032462  000060                      60                    ;TIME FOR 1200 BAUD
10710  032464  000040                      40                    ;TIME FOR 1800 BAUD
10711  032466  000030                      30                    ;TIME FOR 2000 BAUD
10712  032470  000020                      20                    ;TIME FOR 2400 BAUD
10713  032472  000010                      10                    ;TIME FOR 3600 BAUD
10714  032474  000001                       1                    ;TIME FOR 4800 BUAD
10715  032476  000001                       1                    ;TIME FOR 7200 BAUD
10716  032500  000001                       1                    ;TIME FOR 9600 BAUD
10717  032502  000001                       1                    ;TIME OF DELAY FOR 19200 BAUD
10718
10719                                   ;DELAYS WERE COMPUTED TO ALLOW MAXIMUM TIME AT EACH BAUD RATE
10720                                   ;FOR ALL TESTS TO FUNCTION CORRECTLY ON A PDP11/45 WITH BIPOLAR
10721                                   ;MEMORY. THE TIMES WERE ALSO TESTED ON AN 11/40 AND 11/10.
10722
10723  032504                   CORMAX:
10727           001512                  .=MANTO
10728  001512   100000                  100000
10729           000001           .END
```

```
ABASE = 160010
ACDW1 = 000000
ACDW2 = 000000
ACPUOP= 000000
ACTIVE  001412
ADDW0 = 000000
ADDW1 = 000000
ADDW10= 000000
ADDW11= 000000
ADDW12= 000000
ADDW13= 000000
ADDW14= 000000
ADDW15= 000000
ADDW2 = 000000
ADDW3 = 000000
ADDW4 = 000000
ADDW5 = 000000
ADDW6 = 000000
ADDW7 = 000000
ADDW8 = 000000
ADDW9 = 000000
ADEVCT= 000000
ADEVM = 000000
ADRCNT  006635
ADVANC= 104400
AENV  = 000000
AENVM = 000000
AFATAL= 000000
AMADR1= 000000
AMADR2= 000000
AMADR3= 000000
AMADR4= 000000
AMAMS1= 000000
AMAMS2= 000000
AMAMS3= 000000
AMAMS4= 000000
AMSGAD= 000000
AMSGLG= 000000
AMSGTY= 000000
AMTYP1= 000000
AMTYP2= 000000
AMTYP3= 000000
AMTYP4= 000000
APASS = 000000
APRIOR= 000000
APTCSU= 000040
APTENV= 000001
APTSIZ= 000200
APTSPO= 000100
ASWREG= 000000
ATESTN= 000000
AUNIT = 000000
AUSWR = 000000

AUTO.S  012254
AVECT = 000300
AVECT1= 000000
AVECT2= 000000
BAUD    025510
BCOUNT  024110
BINWRD  007110
BIT0  = 000001
BIT00 = 000001
BIT01 = 000002
BIT02 = 000004
BIT03 = 000010
BIT04 = 000020
BIT05 = 000040
BIT06 = 000100
BIT07 = 000200
BIT08 = 000400
BIT09 = 001000
BIT1  = 000002
BIT10 = 002000
BIT11 = 004000
BIT12 = 010000
BIT13 = 020000
BIT14 = 040000
BIT15 = 100000
BIT2  = 000004
BIT3  = 000010
BIT4  = 000020
BIT5  = 000040
BIT6  = 000100
BIT7  = 000200
BIT8  = 000400
BIT9  = 001000
BPTVEC= 000014
BRK0  = 000400
BRK1  = 001000
BRK2  = 002000
BRK3  = 004000
BRK4  = 010000
BRK5  = 020000
BRK6  = 040000
BRK7  = 100000
BRW     005372
BUILD   025002
BYTCNT  027452
CCOUNT  024106
CHRCNT  007106
CLKSRV  024100
CNVRT = 104412
CONVRT= 104411
CORMAX  032504
COUNT0  024660
COUNT1  024662

C00   = 000400
C01   = 001000
C02   = 002000
C03   = 004000
C04   = 010000
C05   = 020000
C06   = 040000
C07   = 100000
CR    = 000015
CRLF  = 000200
CSRMAP  012262
CYCLE   011532
DATABP  007502
DATAHD  007470
DCLASM= 104417
DCLR  = 000020
DCOUNT  024112
DDISP = 177570
DELAY = 104414
DEVADR  006632
DEVICE= 104413
DH1     032073
DH2     032116
DH3     032151
DH4     032163
DH5     032212
DH6     032271
DISPLA  001162
DISPRE  000174
DLYCNT  007204
DLYTBL  032444
DONFLG  001420
DSWR  = 177570
DTR0  = 000400
DTR1  = 001000
DTR2  = 002000
DTR3  = 004000
DTR4  = 010000
DTR5  = 020000
DTR6  = 040000
DTR7  = 100000
DT1     032324
DT2     032336
DT3     032354
DT4     032362
DT5     032400
DT6     032422
DVALID= 100000
DZACTV  001404
DZCR0   001500
DZCR1   001514
DZCR10  001640
DZCR11  001654

DZCR12  001670
DZCR13  001704
DZCR14  001720
DZCR15  001734
DZCR16  001750
DZCR17  001764
DZCR2   001530
DZCR3   001544
DZCR4   001560
DZCR5   001574
DZCR6   001610
DZCR7   001624
DZCSR   002042
DZLEV   030126
DZLPR   002052
DZLV0   001504
DZLV1   001520
DZLV10  001644
DZLV11  001660
DZLV12  001674
DZLV13  001710
DZLV14  001724
DZLV15  001740
DZLV16  001754
DZLV17  001770
DZLV2   001534
DZLV3   001550
DZLV4   001564
DZLV5   001600
DZLV6   001614
DZLV7   001630
DZMSR   002062
DZNUM   001410
DZPRT   030334
DZRBUF  002046
DZRIS   002074
DZRIV   002072
DZTCR   002056
DZTDR   002066
DZTIS   002100
DZTIV   002076
DZVC0   001502
DZVC1   001516
DZVC10  001642
DZVC11  001656
DZVC12  001672
DZVC13  001706
DZVC14  001722
DZVC15  001736
DZVC16  001752
DZVC17  001766
DZVC2   001532
DZVC3   001546

DZVC4   001562
DZVC5   001576
DZVC6   001612
DZVC7   001626
DZ.END  002000
DZ.MAP  001500
ECOUNT  024114
EIAFLG  001414
EIGHT = 000030
EIGHTS= 000070
EMTVEC= 000030
EM1     030566
EM10    031203
EM13    031242
EM14    031273
EM15    031325
EM16    031367
EM17    031440
EM2     030641
EM20    031476
EM21    031537
EM22    031567
EM23    031631
EM24    031661
EM25    031707
EM26    031737
EM27    031766
EM3     030667
EM30    032036
EM4     030726
EM5     030755
EM6     031004
EM7     031042
EM8     031103
EM9     031145
ENDTTB= 024212
ERRMSG  007456
ERRVEC= 000004
ERTABO  007626
EVEPAR= 000000
EXITER  007562
FINI    022434
FIVE  = 000000
FIVES = 000040
FRMERR= 020000
HALTS   007506
HDRFLG  001416
HDZCSR  002044
HDZLPR  002054
HDZMSR  002064
HDZRBU  002050
HDZTCR  002060
HDZTDR  002070
```

```
HILIM   006630
HT    = 000011
INBUF   011262
INIFLG  001415
INIT    021714
INIT1   021740
INSTER= 104404
INSTR = 104403
INSTR2  006430
INTRAN  026732
INTREC  026552
INTSVC  026116
IOTVEC= 000020
LAST    027444
LESS1   030336
LF    = 000012
LIMITS  006556
LINE    001364
LINESP  027454
LINEX   025526
LINE0   001506
LINE1   001522
LINE10  001646
LINE11  001662
LINE12  001676
LINE13  001712
LINE14  001726
LINE15  001742
LINE16  001756
LINE17  001772
LINE2   001536
LINE3   001552
LINE4   001566
LINE5   001602
LINE6   001616
LINE7   001632
LOBITS  006634
LOCK    001362
LOCKUP  027442
LOLIM   006626
LP0   = 000000
LP1   = 000001
LP2   = 000002
LP3   = 000003
LP4   = 000004
LP5   = 000005
LP6   = 000006
LP7   = 000007
MAINT = 000010
MANT0   001512
MANT1   001526
MANT10  001652
MANT11  001666
MANT12  001702
MANT13  001716
MANT14  001732
MANT15  001746
MANT16  001762
MANT17  001776
MANT2   001542
MANT3   001556
MANT4   001572
MANT5   001606
MANT6   001622
MANT7   001636
MASTEK  010756
MBADLN  011065
MCABLE  027773
MCHAR   027640
MCSRX   010706
MDATA   011366
MEPASS  010525
MERRPC  011033
MERRX   010733
MERR2   010564
MERR3   010633
MINVAL  027564
MLINE   027612
MLOCK   010657
MNEW    010761
MNTFLG  001417
MODE    001370
MPASS   027550
MPASSX  010722
MPFAIL  010462
MQUICK  030010
MR      010550
MREGAD  027514
MSENAB= 000040
MSPEED  027622
MTERM   027746
MTITLE  001000
MTSTN   010744
MVECTO  027472
MVECX   010714
MWHICH  027700
NEXT    001360
NUMLIN  027460
NUMTCR  027462
ODDPAR= 000200
OFFSET  025242
ONESTO= 000000
OTHER   025470
OUT     022362
OVRRUN= 040000
PAR     001366
PARAM = 104405
PARAM1  006476
PARER = 010000
PARERR  006552
PARESE  024506
PARITY= 000100
PARMD = 104415
PAR0    001510
PAR1    001524
PAR10   001650
PAR11   001664
PAR12   001700
PAR13   001714
PAR14   001730
PAR15   001744
PAR16   001760
PAR17   001774
PAR2    001540
PAR3    001554
PAR4    001570
PAR5    001604
PAR6    001620
PAR7    001634
PAWCH = 104416
PIRQ  = 177772
PIRQVE= 000240
POPR0 = 012600
POP1SP= 005726
POP2SP= 022626
PRIO    027464
PR0   = 000000
PR1   = 000040
PR2   = 000100
PR3   = 000140
PR4   = 000200
PR5   = 000240
PR6   = 000300
PR7   = 000340
PS    = 177776
PSW   = 177776
PUSHR0= 010046
PUSH1S= 005746
PUSH2S= 024646
PWRVEC= 000024
QUITS   026544
RCVON = 010000
RDATA   027450
RDONE = 000200
RECDAT  027466
REGIST  001400
RESREG  007504
RESTAR  012076
RESVEC= 000010
RES05 = 104410
RIE   = 000100
RING0 = 000001
RING1 = 000002
RING2 = 000004
RING3 = 000010
RING4 = 000020
RING5 = 000040
RING6 = 000100
RING7 = 000200
RL0   = 000000
RL1   = 000400
RL2   = 001000
RL3   = 001400
RL4   = 002000
RL5   = 002400
RL6   = 003000
RL7   = 003400
RSTART  021704
RSTRT   026766
RUN     001406
RXISR1  025030
RXSVC   022204
RXTCR   022462
R6    =%000006
R7    =%000007
SAVLIN  001372
SAVNUM  001411
SAVPC   001402
SAV05 = 104407
SCOP1 = 104401
SERV.G  007642
SET     027242
SETAPT  012102
SETFLG= 104406
SET.PS  011430
SET1    027274
SEVEN = 000020
SEVENS= 000060
SILOAL= 020000
SILOEN= 010000
SIX   = 000010
SIXS  = 000050
SNAP    022034
SPACNT  007107
SPEED   027456
SPIN    026512
STACK = 001120
STFLG   027440
STKLMT= 177774
STOP    001462
SV05    006644
SWR     001160
SWREG   000176
SW0   = 000001
SW00  = 000001
SW01  = 000002
SW02  = 000004
SW03  = 000010
SW04  = 000020
SW05  = 000040
SW06  = 000100
SW07  = 000200
SW08  = 000400
SW09  = 001000
SW1   = 000002
SW10  = 002000
SW11  = 004000
SW12  = 010000
SW13  = 020000
SW14  = 040000
SW15  = 100000
SW2   = 000004
SW3   = 000010
SW4   = 000020
SW5   = 000040
SW6   = 000100
SW7   = 000200
SW8   = 000400
SW9   = 001000
S110  = 001000
S1200 = 003400
S134  = 001400
S150  = 002000
S1800 = 004000
S19200= 007400
S2000 = 004400
S2400 = 005000
S300  = 002400
S3600 = 005400
S4800 = 006000
S50   = 000000
S600  = 003000
S7200 = 006400
S75   = 000400
S9600 = 007000
TABLE2  027336
TBITVE= 000014
TBUF    027470
TCCONT  024212
TCR0  = 000001
TCR1  = 000002
TCR2  = 000004
TCR3  = 000010
TCR4  = 000020
TCR5  = 000040
```

```
TCR6  = 000100
TCR7  = 000200
TDATA   02744o
TDO     001422
TD1     001424
TD2     001426
TD3     001430
TD4     001432
TD5     001434
TD6     001436
TD7     001440
TEIGHT  002140
TEMP    011324
TEST1   025656
TEST2   026314
TFIVE   002146
TIE   = 040000
TKVEC = 000060
TLAST = 023720
TL0   = 000000
TL1   = 000400
TL2   = 001000
TL3   = 001400
TL4   = 002000
TL5   = 002400
TL6   = 003000
TL7   = 003400
TMTBL   002102
TPVEC = 000064
TRAPVE= 000034
TRDY  = 100000
TRTVEC= 000014
TR0     001442
TR1     001444
TR2     001446
TR3     001450
TR4     001452
TR5     001454
TR6     001456
TR7     001460
TSEVEN  002142
TSIX    002144
TST1    013036
TST10   013754
TST11   014112
TST12   014274
TST13   014412
TST14   014542
TST15   014632
TST16   014716
TST17   015112
TST2    013226
TST20   015250
TST21   015374
TST22   015732
TST23   016260
TST24   016612
TST25   017070
TST26   017400
TST27   017726
TST3    013312
TST30   020360
TST31   020546
TST32   021274
TST33   021656
TST34   022464
TST35   023174
TST36   023446
TST37   023720
TST4    013404
TST5    013476
TST6    013570
TST7    013662
TTABLE  024116
TTST    005140
TWOSTO= 000040
TXSVC   022106
TYPDAT  007472
TYPE  = 104402
TYPMSG  007362
T110    002106
T1200   002120
T134    002110
T150    002112
T1800   002122
T2000   002124
T2400   002126
T300    002114
T3600   002130
T4800   002132
T50     002102
T600    002116
T7200   002134
T75     002104
T9600   002136
VECMAP  012644
VEC1    025306
VEC2    025316
WCHFLG  027436
WRDCNT  007104
WTBS.F  007460
XBEGIN  025556
XBX     007250
XCSR    005072
XEOP    026752
XERR    005114
XHEAD   011040
XMTCNT  001376
XMTLIN  001374
XMTSRV  024664
XPASS   005106
XSTART  025244
XSTATQ  011130
XTCR0   027250
XTCR1   027264
XTSTN   007634
XVEC    005100
XX    = 160210
YY    = 000500
ZZ    = 000020
$APTHD  001462
$ATYC   006020
$ATY1   005774
$ATY3   006002
$ATY4   006012
$AUTOB  001154
$BASE   001310
$BDADR  001142
$BDDAT  001146
$CDW1   001314
$CDW2   001316
$CHARC  005770
$CMTAG  001120
$CM1  = 000006
$CM2  = 000014
$CM3  = 000006
$CM4  = 000004
$CPUOP  001262
$CRAP = 177777
$CRLF   001231
$DDW0   001320
$DDW1   001322
$DDW10  001344
$DDW11  001346
$DDW12  001350
$DDW13  001352
$DDW14  001354
$DDW15  001356
$DDW2   001324
$DDW3   001326
$DDW4   001330
$DDW5   001332
$DDW6   001334
$DDW7   001336
$DDW8   001340
$DDW9   001342
$DEVCT  001244
$DEVM   001312
$DOAGN  005066
$E    = 000041
$ENDAD  005056
$ENDCT  005042
$ENV    001254
$ENVM   001255
$EOP    004712
$EOPCT  005034
$ERFLG  001123
$ERMAX  001135
$ERROR  007220
$ERRPC  001136
$ERRTB  001360
$ERTTL  001132
$ETABL  001254
$ETEND  001360
$FATAL  001236
$FFLG   006240
$FILLC  001176
$FILLS  001175
$GDADR  001140
$GDDAT  001144
$GET42  005046
$HD   = 000001
$HIBTS  001462
$ICNT   001124
$ILLUP  010454
$INTAG  001155
$ITEMB  001134
$LF     001232
$LFLG   006237
$LPADR  001126
$LPERR  001130
$MADR1  001266
$MADR2  001272
$MADR3  001276
$MADR4  001302
$MAIL   001234
$MAMS1  001264
$MAMS2  001270
$MAMS3  001274
$MAMS4  001300
$MBADR  001464
$MFLG   006236
$MSGAD  001250
$MSGLG  001252
$MSGTY  001234
$MTYP1  001265
$MTYP2  001271
$MTYP3  001275
$MTYP4  001301
$MXCNT  005374
$N    = 000037
$NULL   001174
$NWTST= 000000
$OVER   005336
$PASS   001242
$PASTM  001470
$PWRAD  010450
$PWRDN  010310
$PWRMG  010444
$PWRUP  010362
$QUES   001230
$REGAD  001200
$REG0   001202
$REG1   001204
$REG2   001206
$REG3   001210
$REG4   001212
$REG5   001214
$RTNAD  005070
$SAVR6  010460
$SCOPE  005122
$SETUP= 000000
$SVLAD  005320
$SVPC = 000040
$SWR  = 164000
$SWREG  001256
$SWRMK= 000000
$TESTN  001240
$TIMES  001226
$TKB    001166
$TKS    001164
$TMP0   001216
$TMP1   001220
$TMP2   001222
$TMP3   001224
$TN   = 000040
$TPB    001172
$TPFLG  001177
$TPS    001170
$TSTM   001466
$TSTNM  001122
$TYPE   005440
$TYPEC  005652
$TYPEX  005772
$UNIT   001246
$UNITM  001472
$USWR   001260
$VECT1  001304
$VECT2  001306
$XOFF = 000023
$XON  = 000021
$XTSTR  005176
$Y    = 000020
$$GET4= 000000
.     = 001514
```

```
.ADVAN  007206    .DELAY  007166    .INST1  006262    .RES05  006676    .START  002150
.BEGIN  004624    .DEVIC  007134    .MSG    006264    .SAV05  006636    .TRPSR  007112
.CNVRT  006734    .ERRTA  030340    .PARAM  006436    .SCOPE  005122    .TRPTA  002002
.CONVR  006730    .INSTE  006416    .PARMD  026772    .SCOP1  005376    .TYPE   005422
.DCLAS  007154    .INSTR  006242    .PAWCH  027166    .SETFL  011142    .$X   = 001462

. ABS.  032504      000

 ERRORS DETECTED:  0

 CZDZAI.BIN,CZDZAI.SEQ=SYSMAC.SML,CZDZAI.P11
 RUN-TIME: 20 23 .7 SECONDS
 RUN TIME RATIO: 64/45=1.4
 CORE USED:  52K  (103 PAGES)
```