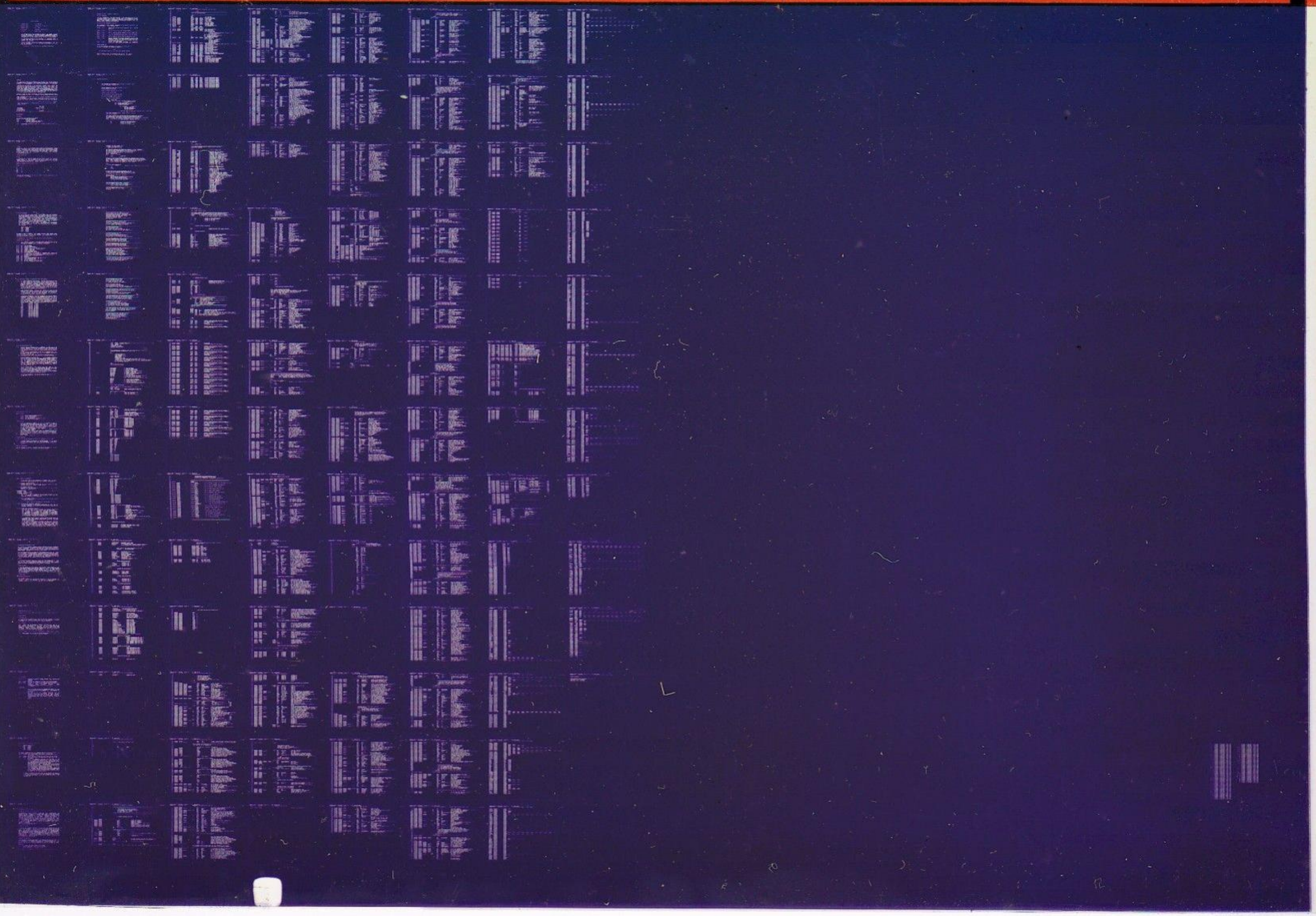
DZV11 DIAG PRT1 CNDZAA0 AH-T444A-MC FICHE 1 OF 1



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        .REM    &
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IDENTIFICATION

PRODUCT CODE:	AC-T443A-MC
PRODUCT NAME:	CNDZAA0 DZV11 DIAG PRT1
PRODUCT DATE:	DEC, 1982
MAINTAINER:	DIAGNOSTIC SERVICES/ISS
AUTHOR:	BRUCE LUHRS

1. ABSTRACT

THE FUNCTION OF THE DZV11 DIAGNOSTICS IS TO VERIFY THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS ALSO VERIFY THAT THE DZV11 OPERATES IN ITS ENVIRONMENT SUCH AS THE SYSTEM IN WHICH IT IS INSTALLED.

PARAMETERS MAY BE SUPPLIED TO THE PROGRAM BY EITHER 'AUTO SIZING' OR INPUT FROM THE USER ON THE CONSOLE BY HAVING SW00=1 AT START TIME. AUTO SIZING WILL BE DONE ONLY THE FIRST TIME THE PROGRAM IS STARTED AND SW07=0 AND SW00=0 AND SW03=0. THE AUTOSIZER IS DESIGNED TO DETECT DZV11 DEVICE ADDRESSES AND VECTORS ONLY. ALL REMAINING PARAMETERS WILL DEFAULT TO CERTAIN VALUES (SEE SEC.8.5). CONSOLE INPUT MAY BE CONTROLLED AT ANY START TIME THROUGH THE USE OF SW00,SW03, SW04, AND SW06 (SEE SEC. 4.1.1 FOR A DETAILED DESCRIPTION OF THESE SWITCHES).

CURRENTLY THERE ARE THREE STANDALONE DIAGNOSTICS (CNDZA,CNDZB,AND CNDZC) ONE SYSTEM MODULE FOR DEC X/11 (CXDZBA), AND AN OVERLAY FOR ITEP (CVDZD).

CNDZA TOGETHER WITH CNDZB WILL TEST ALL LOGICAL FUNCTIONS OF THE DZV11 INTERFACE MODULE.
CNDZC IS DESIGNED AS A NON-CHAINABLE STANDALONE DIAGNOSTIC PROVIDING THE OPERATOR WITH DIRECT CONTROL OVER THE TESTING OF ALL DZV11 EIA CABLES.

```
**********************************************************************
*                                                          ;;GPA     *
* NOTE: THIS DIAGNOSTIC HAS BEEN MODIFIED TO RUN IN KXT11 (SBC 11/21)  *
* BASED SYSTEMS.                                                     *
*                                                                    *
```

	SBC 11/21
CSR RANGE:	174000 TO 177770
VECTOR RANGE:	300 TO 370
AUTO SIZING FOR CSR AND VECTOR:	DISABLED

```
**********************************************************************
```

2. REQUIREMENTS

2.1 EQUIPMENT

AN LSI11 CPU WITH MINIMUM 4K OF MEMORY.
ASR 33 (OR EQUIVALENT FOR CONSOLE)

DZV11	INTERFACE MODULE
H329	STAGGERED TURNAROUND CONNECTOR.
H325	CABLE TURNAROUND CONNECTOR.

NOTE: A STAGGERED TURNAROUND CONNECTOR IS NEEDED IN ORDER TO TEST THE PARITY LOGIC.

2.2 STORAGE

PROGRAM WILL USE ALL 4K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 1740 ARE ESPECIALLY TO BE NOTED AND TO BE UNTOUCHED BY OPERATOR AFTER PARAMETERS HAVE BEEN INPUT FROM CONSOLE (SW00=1); OR AFTER THE 'AUTO SIZING' HAS BEEN DONE. THESE LOCATIONS MAY BE CHANGED IF THE USER UNDERSTANDS THEIR MEANING AND DIFFERENT PARAMETERS ARE REQUIRED.

3. LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER. NOTE: IF THE DIAGNOSTICS ARE ON A MEDIA SUCH AS DISK ,MAGTAPE,DECTAPE, OR CASSETTE; FOLLOW INSTRUCTIONS FOR THE MONITOR WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY * SIZE

4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 STARTING THE PROCESSOR AT THE ABSOLUTE LOADER STARTING ADDRESS WILL LOAD THE DIAGNOSTIC INTO MEMORY.

4. STARTING PROCEEDURE

A. SET SWR TO ZERO FOR 'AUTO SIZING' OR SET SW00=1 FOR USER PARAMETER INPUT FROM CONSOLE TERMINAL. NOTE: LOC. 000176 IS USED AS A SOFTWARE SWITCH REGISTER IN ALL OF THE DZV11 DIAGNOSTICS. (SEE SEC. 4.1) ON THE FIRST STARTUP OF THE DIAGNOSTIC IF SW07=1 AND SW00=0 THE PROGRAM WILL ASSUME THAT THE STATUS TABLE HAS BEEN ALREADY BUILT FROM A PREVIOUS DZV11 DIAGNOSTIC RUN. NOTE: ANY DZV11 DIAGNOSTIC WILL OVERLAY THE STATUS TABLE WHEN LOADED TO PRESERVE ITS CONTENTS AND THUS WILL NOT ALTER A PREVIOUSLY BUILT TABLE.

B. START THE DIAGNOSTIC AT LOC. 200(8). THE PROGRAM WILL TYPE MAINDEC AND PROGRAM NAMES (IF THIS WAS THE FIRST START UP OF THE PROGRAM) AND ALSO THE FOLLOWING: (ON THE FIRST PROGRAM RUN OR IF PARAMETERS WERE CHANGED)

```
'MAP OF DZV11 STATUS'
1500    160100
1502    000300
1504    000017
1506    017470
1510    000000
```

THE ABOVE IS ONLY AN EXAMPLE! THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADD. 1500 IN THE PROGRAM. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS TABLE SEE SECTION 8.4 FOR HELP.

THE PROGRAM WILL TYPE "RUNNING" AND PROCEED TO RUN THE DIAGNOSTIC.

4.1 CONTROL SWITCH SETTINGS

NOTE: THIS PROGRAM UTILIZES A SOFTWARE SWITCH REGISTER WHICH MAY BE MODIFIED BY CHANGING LOC. 176 OR BY TYPING CONTROL "G" (^G) ON THE CONSOLE TERMINAL WHILE THE PROGRAM IS RUNNING.

SW 15	SET:	HALT ON ERROR
SW 14	SET:	LOOP ON CURRENT TEST
SW 13	SET:	INHIBIT ERROR PRINT OUT
SW 12	SET:	INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
SW 11	SET:	INHIBIT ITERATIONS. (QUICK PASS)
SW 10	SET:	ESCAPE TO NEXT TEST
SW 09	SET:	LOOP WITH CURRENT DATA
SW 08	SET:	CATCH ERROR AND LOOP ON IT
SW 07	SET:	NO AUTO SIZE. IF 1ST START OF PROGRAM AFTER LOADING AND IF SW00=0 THEN THE PROGRAM WILL ASSUME THAT THE STATUS MAP HAS BEEN BUILT FROM A PREVIOUS DZV11 DIAGNOSTIC RUN.
SW 06	SET:	RESELECT DZV11'S DESIRED ACTIVE
SW 05	SET:	RESERVED
SW 04	SET:	SELECT DELAY PARAMETER (SEE SEC. 4.1.1)
SW 03	SET:	EXTRA PARAMETER INPUT (SEE SEC. 4.1.1)
SW 02	SET:	LOCK ON SELECTED TEST
SW 01	SET:	RESTART PROGRAM AT SELECTED TEST
SW 00	SET:	GET USERS PARAMETERS FROM CONSOLE

4.1.1 SWITCH REGISTER CONTROL OF PARAMETER INPUT FROM CONSOLE

SW 00 GET USERS PARAMETERS FROM CONSOLE. SETTING THIS SWITCH AT START UP TIME ALLOWS THE USER TO INPUT AT THE CONSOLE TERMINAL THE FOLLOWING PARAMETERS: BASE DEVICE ADDRESS, BASE VECTOR ADDRESS, MODE OF OPERATION (EXTERNAL, INTERNAL, OR STAGGERED), AND THE NUMBER OF DZV11'S THAT ARE RUNNING. USING THIS SWITCH ALONE WILL DEFAULT THE FOLLOWING PARAMETERS: ALL 4 LINES ARE SET TO BE TESTED ON EACH DZV11, THE DEFAULT BAUD RATE IS SET AT 19.2 KBAUD AND THE CHARACTER LENGTH FOR THE MAJORITY OF TESTING IS SET AT EIGHT BITS PER CHARACTER WITH TWO STOP BITS.

SW 03 EXTRA PARAMETER INPUT. SETTING THIS SWITCH AT START UP TIME PROVIDES THE USER WITH THE ABILITY TO SET THE LINES ACTIVE FOR TESTING AND TO SET THE DEFAULT BAUD RATE USED FOR THE MAJORITY OF THE DIAGNOSTIC TESTS. THE DELAY PARAMETER IS AUTOMATICALLY ADJUSTED TO THE BAUD RATE GIVEN BY THE USER.

SW 04 SELECT DELAY PARAMETER. THE DELAY PARAMETER THIS SWITCH CONTROLS DETERMINES THE LENGTH OF TIME THE PROGRAM STALLS WAITING FOR A CHARACTER TO BE COMPLETELY TRANSMITTED OR RECEIVED. THIS DELAY COUNT IS AUTOMATICALLY SET TO PROVIDE ENOUGH DELAY TIME FOR THE DEFAULT BAUD RATE SPECIFIED WHEN RUNNING THE PROGRAM ON AN LSI11 WITH MOS MEMORY. WHEN RUNNING THIS PROGRAM ON A PROCESSOR WITH A FASTER MEMORY SPEED THIS DELAY COUNT SHOULD BE ADJUSTED PROPORTIONATELY HIGHER THAN THE FOLLOWING DEFAULTED VALUES:

```
2450          ;TIME FOR   50 BAUD
1560          ;TIME FOR   75 BAUD
1120          ;TIME FOR  110 BAUD
0750          ;TIME FOR  134 BAUD
0660          ;TIME FOR  150 BAUD
0330          ;TIME FOR  300 BAUD
0150          ;TIME FOR  600 BAUD
0060          ;TIME FOR 1200 BAUD
0040          ;TIME FOR 1800 BAUD
0030          ;TIME FOR 2000 BAUD
0020          ;TIME FOR 2400 BAUD
0010          ;TIME FOR 3600 BAUD
0001          ;TIME FOR 4800 BAUD
0001          ;TIME FOR 7200 BAUD
0001          ;TIME FOR 9600 BAUD
0001          ;TIME FOR 19.2 KBAUD
```

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 06 RESELECT DZV11'S DESIRED ACTIVE. A MESSAGE IS TYPED OUT ON THE CONSOLE TERMINAL ASKING THE OPERATOR TO TYPE A BIT MAP OF THE DZV'S DESIRED ACTIVE. USING THIS SWITCH ALLOWS LOCATION DZVACTV TO BE ALTERED (SEE SEC. 8.3 FOR A DESCRIPTION OF THIS LOCATION).
EXAMPLE:
IF THE DEVICES CORRESPONDING TO THE DZV11'S NUMBERED ZERO, TWO, AND FOUR IN THE DZV11 STATUS MAP (LOC. 1500 THROUGH 1740) ARE TO BE TESTED, TYPE IN: 25
THIS WILL SET BITS ZERO, TWO, AND FOUR IN LOCATION DZVACTV. ALL REMAINING DEVICES IN THE STATUS MAP WILL THEN NOT BE TESTED.

SW 01 RESTART PROGRAM AT SELECTED TEST IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HAS BEEN MADE BEFORE TRYING TO SELECT A TEST THAT IS NOT IN THE ORDER OF SEQUENCE THE REASON BEING IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS.
NOTE: IF RUNNING MULTIPLE DZV11'S, THE DZV11 YOU DESIRE TO BE UNDER TEST MUST BE SELECTED BY THE USE OF SW06 BEFORE LOCKING ON THE TEST. IN OTHER WORDS; EACH TIME THE PROGRAM IS STARTED; THE FIRST DZV11 WILL BE SELECTED TO BE UNDER TEST UNLESS SW06 IS USED TO SELECT ONLY ONE.

SW 09 LOOP ON CURRENT DATA: THIS SWITCH WILL ONLY WORK IF CALL 'SCOP1' IS IN THAT TEST. THE REASON BEING THAT MOST TESTS DEAL WITH BLOCKS OF DIFFERENT DATA TO BE SENT OR RECEIVED ALL AT ONCE THUS IN BLOCK DATA, ONE PATTERN CAN'T BE SINGLED OUT.
THIS SWITCH IS DESIGNED TO PROVIDE AN AID FOR A TRAINED TROUBLE-SHOOTER TO SAMPLE VARIOUS SIGNALS ON THE MODULE AND IS NOT MEANT TO BE USED AS A GENERAL USER CONTROL SWITCH.

SW 04 SELECT DELAY PARAMETER: THIS SWITCH SHOULD BE USED WITH CARE AS TOO SHORT A DELAY WILL CAUSE VALID TESTS TO FAIL.
(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 GO TO 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 DZV11 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 - THE STARTING ADDRESS FOR ANY DZV11 DIAGNOSTIC IS LOC. 200

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY. AFTER *ALL* AVAILABLE DZV11S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEEDURE

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

5.1 NORMAL START OF DIAGNOSTIC

ON THE FIRST START OF THE DIAGNOSTIC AT ADDRESS 200, IF SW00=1 THEN THE FOLLOWING QUESTIONS ARE ASKED AND MUST BE ANSWERED:

"1ST CSR ADDRESS (160000:163770): "
YOU MUST TYPE IN THE FIRST DZV11 CSR IN THE SYSTEM YOU WISH TESTING TO BEGIN AT. RANGE: 160000:163770

"1ST VECTOR ADDRESS (300:770): "
YOU MUST TYPE IN THE VECTOR OF THE FIRST DZV11 IN THE SYSTEM UNDER TEST. RANGE 300:770

'MAINTENANCE MODE
[EXTERNAL <H325> (E)]
[INTERNAL <DZCSR03=1>(I)]
[STAGGERED <H329> (S)] :
TYPE "E" OR "I" OR "S" DEPENDING ON WHICH MODE YOU WISH TO RUN IN. IF RUNNING "EXTERNAL"; ALL SELECTED LINES MUST BE TERMINATED BY AN H325 TEST CONNECTOR.

"# OF DZV11'S <IN OCTAL> (1:20): "
TYPE TOTAL NUMBER OF DZV11'S TO BE TESTED IN THE SYSTEM. RANGE IS 1 THRU 20 IN OCTAL.

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

'LINES ACTIVE BY BIT <IN OCTAL> (001:017):"
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).

'DEFAULT BAUD RATE <IN OCTAL> (00:17): "
THIS GIVES THE USER A CHANCE TO CHANGE THE DEFAULT BAUD RATE USED IN APP. 90% 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.

IT IS IMPORTANT TO NOTE THAT ALL DZV11'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 DZV11'S IN THE SYSTEM.
IF THE MODE OF OPERATION IS DIFFERENT FOR EACH DZV11 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 DZV11 UNDER TEST AND INDICATE ONE DZV11 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.

5.2 PROGRAM AND/OR OPERATOR ACTION

THE VARIETY OF PROGRAM CONTROL SWITCHES PROVIDED IN THIS DIAGNOSTIC PACKAGE IS DESIGNED TO PROVIDE THE USER WITH A WIDE RANGE OF TROUBLE-SHOOTING TECHNIQUES. BEFORE THE USER ATTEMPTS TO RUN THIS DIAGNOSTIC HE SHOULD BECOME FAMILIAR WITH THE USE OF THESE CONTROL SWITCHES AND THEIR RESTRICTIONS. (SEE SEC. 4.1, 4.1.1, 4.1.2, 4.1.3)

WHEN THE PROGRAM DETECTS AN ERROR THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBLY AN ERROR MESSAGE (DEPENDING ON THE PARTICULAR ERROR). IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT THEN LOOK IN THE PROGRAM LISTING FOR THAT TEST NUMBER AND THEN NOTE THE PC OF THE ERROR REPORT. THE REASON FOR THE ERROR REPORT WILL BECOME CLEARER WHEN READING THE COMMENTS IN THE PROGRAM LISTING.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE THE ERROR MESSAGE WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.1 ERROR RECOVERY

IF FOR SOME REASON THE DZV11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN, LOOK IN LOCATION '$TSTNM' (ADDRESS 1246) FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DZV11 WAS DOING AT THE TIME OF THE ERROR.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4.1.2
THE STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW THE PROGRAM WAS STARTED. ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETELY ISOLATE PROBLEMS.

7.2 OPERATING RESTRICTIONS

PARAMETER MUST BE INPUT FROM USER OR APT IF "AUTO SIZING" IS NOT USED.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ALL DZV11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 2 MIN. THIS IS ASSUMING SW11=1 (INHIBIT ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION.

8.2 PASS COMPLETE

NOTE: *EVERY* TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO *HARD* ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTIL ALL DZV11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS CNDZA-A CSR: 160100 VEC: 300 PASSES: 000001 ERRORS: 000000

NOTE: THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE VALUES FOR THE DEVICE. THEY ARE ONLY FOR THIS EXAMPLE.

8.3 KEY LOCATIONS

$LPADR (1252)	CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.
NEXT (1362)	CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.
$TSTNM (1246)	CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.
RUN (1412)	THE BIT IN 'RUN' ALWAYS POINTS ONE PAST THE DZV11 CURRENTLY BEING TESTED. EXAMPLE: (RUN) 1412/0000000001000000 MEANS THAT DZV11 NO.5 IS THE DZV11 NOW RUNNING.
STATUS MAP (1500)-(1740)	THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 16 (DECIMAL) DZV11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DZV11.
DZVACTV(1406)	EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DZV11 WILL BE TESTED IN TURN. EXAMPLE: (DZVACTV) 1406/0000000000011111 MEANS THAT DZV11 NO. 00,01,02,03,04 WILL BE TESTED. EXAMPLE: (DZVACTV) 1406/0000000000010001 MEANS THAT DZ11 NO. 00,04 WILL BE TESTED.
$BASE (1174)	CONTAINS THE RECEIVER CSR OF THE CURRENT DZV11 UNDER TEST.

8.4 MORE ON THAT 'STATUS TABLE' (1500-1740)

```
'MAP OF DZV11 STATUS'
1500    160100
1502    000300
1504    000017
1506    017470
1510    000000
```

THE ABOVE INFORMATION WILL BE REPEATED FOR EACH OF UP TO 16 DZV11'S IN THE SYSTEM(THESE WILL FOLLOW UNDER THIS TABLE). EXPLANATION:

1500	160100	THIS IS THE SYSTEM CONTROL REGISTER FOR THE 1ST DZV11 IN THE SYSTEM.
1502	000300	THIS IS VECTOR 'A' FOR THE FIRST DZV11 IN THE SYSTEM.
1504	000017	THIS IS THE BINARY REPRESENTATION OF WHAT LINES ARE TO BE TESTED.
1506	017470	THIS IS THE PARAMETER LOCATION USED IN MOST OF THE TESTS. IT INDICATES PARAMETERS OF: RX ON, SPEED SELECT 17 (19.2K BAUD) EIGHT BITS PER CHAR, AND TWO STOP BITS. THE USER MAY ALTER THE STOP BITS AND THE SPEED, BUT THE REMAINING PARAMETERS SHOULD BE LEFT ALONE. THIS LOCATION IS USED TO LOAD THE DZV11 LINE PARAMETER REGISTER FOR EACH LINE. THE MEANING OF THE BITS SET IN THIS LOCATION IS THE SAME AS THE FUNCTION OF THE RELATED BITS IN THE DEVICE LINE PARAMETER REGISTER.
1510	000000	THIS LOCATION WILL CONTAIN EITHER ALL ZEROS INDICATING THAT INTERNAL LOOP WAS SELECTED AS MODE OF OPERATION OR IT WILL CONTAIN 100000 INDICATING THAT "STAGGERED MODE" WAS SELECTED OR IT WILL CONTAIN 000200 INDICATING THAT "EXTERNAL" WAS THE MODE SELECTED.

THE ABOVE IS REPEATED FOR EACH DZV11 IN THE SYSTEM. THE TABLE IS FILLED BY AUTO SIZING OR BY THE MANUAL PARAMETER INPUT PROGRAM AS DESCRIBED PREVIOUSLY. ALSO IF DESIRED BY USER; THE LOCATIONS MAY BE ALTERED BY HAND TO SUIT THE SPECIFIC CONFIGURATION.

8.5 *** METHOD OF AUTO SIZING ***

8.5.1 FINDING THE CONTROL STATUS REGISTER.

THE PROGRAM WILL START AT ADDRESS 160000 AND START 'REFERENCING' THE ADDRESS IN THE POINTER. IF A NON-EX MEMORY TRAP OCCURES, THE POINTER (HOLDING 160000) IS UPDATED BY 10 AND THE ABOVE IS REPEATED UNTIL ADDRESS 163770 IS REACHED. IF A 'BUS REPLY' RESPONSE WAS ISSUED BY THE DZV11 (OR ANY OTHER DEVICE) (NO NXM TRAP), "MASTER SCAN ENABLE" IS ATTEMPTED TO BE SET AND THE TCR BITS FOR ALL FOUR LINES ARE SET. "TRDY" IS THEN TESTED TO BE SET AND "MASTER SCAN ENABLE" IS TESTED TO BE STILL SET. THE DIAGNOSTIC WILL THEN CHECK THAT AT LEAST ONE TCR BIT IS STILL SET. IF ALL OF THE ABOVE WORKED, THIS DEVICE IS ASSUMED TO BE A DZV11. IF ANY OF THE ABOVE FAILED, UPDATING OF THE POINTER IS DONE AND THE SEQUENCE IS REPEATED.
NOTE: IF THE PROGRAM DOES NOT FIND YOUR DZV11, SOMETHING IS WRONG AND AUTO SIZING SHOULD NOT BE DONE.

8.5.2 FINDING THE VECTOR

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '.+2' (NEXT ADDRESS). BIT14 AND BIT5 (TX INTERUPT ENABLE AND MSTSCAN ENABLE) ARE SET INTO THE DZVCSR. ALL TCR BITS ARE SET, A DELAY OCCURS, AND IF NO INTERUPT OCCURES (BECAUSE OF A BAD DZV11) THE PROGRAM ASSUMES VECTOR ADDRESS 300 AND THE PROBLEM SHOULD BE FIXED IN THE DIAGNOSTIC. ONCE THE PROBLEM IS FIXED, THE PROGRAM SHOULD BE SETUP AGAIN TO SET THE CORRECT VECTOR. IF AN INTERUPT OCCURRED, THE ADDRESS TO WHICH THE DZV11 INTERUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU, THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.5.3 PARAMETER ASSUMPTIONS.

SINCE TOO MUCH HARDWARE WOULD NEED TO BE TURNED ON TO SIZE THE REST OF THE PARAMETERS; THE PROGRAM MUST ASSUME THE REMAINING VARIATIONS. THE RESULT IF NOT TO YOUR SPECIFIC CONFIGURATION MAY BE ALTERED BY HAND. IN THIS WAY 95% OF THE PARAMETER SETUP WAS DONE BY THE PROGRAM AND 5% BY YOU.
THEREFORE:
1) ALL FOUR LINES ARE ASSUMED TO BE TESTED.
2) DEFAULT BAUD RATE IS SET TO 17 (19.2 KBAUD).
3) MODE OF OPERATION IS "INTERNAL MODE".

FOR ALL PARAMETER ADJUSTMENTS PLEASE REFER TO SECTION 8.4 FOR GREATER DETAIL.

9.0 RUNNING THE DZV11 DIAGNOSTIC UNDER APT

9.1.1 THE APT INTERFACE

THE DZV DIAGNOSTICS HAVE BEEN DESIGNED TO BE COMPATIBLE WITH THE APT (AUTOMATED PRODUCT TEST) SYSTEM. THE DZV LOGIC TEST DIAGNOSTICS (CVDZA, AND CVDZB) CAN BE RUN AS STANDALONE DIAGNOSTICS OR IN EITHER OF THE APT MODES. CVDZC, HOWEVER IS DESIGNED AS A STANDALONE DIAGNOSTIC ONLY AND REQUIRES DIRECT OPERATOR PARTICIPATION.

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 -(1142)	USED AS THE SOFTWARE SWITCH REGISTER WHILE RUNNING UNDER APT.
$VECT1 -(1170)	USED TO SPECIFY THE FIRST VECTOR ADDRESS
$BASE -(1174)	USED TO INDICATE BOTTOM ADDRESS OF DZV11 UNDER TEST
$DEVM -(1176)	A BIT MAP REPRESENTING WHICH DZV11'S WILL BE TESTED
$CDW1 -(1200)	USED TO INDICATE WHICH LINES TO RUN ON ALL DZV11'S
$CDW2 -(1202)	USED TO INDICATE THE DEFAULT TEST MODE. SET TO 0 FOR INTERNAL TESTING, 200 FOR EXTERNAL LOOP BACK (H325 INSTALLED), OR SET TO 100000 FOR STAGGERED LOOP BACK TESTING (H329 INSTALLED).
$DDW0 -(1204)	EACH OF THE $DDW WORDS DESCRIBES THE PARAMETERS (LPR) FOR A PARTICULAR DZV11, GOING UP TO 16 DZV11'S

9.1.3 RUNNING UNDER APT

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 DZV11 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.

10.0 PROGRAM DESCRIPTION

THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
PACKAGE (MAINDEC-11-DZQAC-C3).

INITIAL ADDRESS OF THE STACK POINTER **1120**
MISCELLANEOUS DEFINITIONS

GENERAL PURPOSE REGISTER DEFINITIONS

PRIORITY LEVEL DEFINITIONS

"SWITCH REGISTER" SWITCH DEFINITIONS

DATA BIT DEFINITIONS (BIT00 TO BIT15)

BASIC "CPU" TRAP VECTOR ADDRESSES

BITS 15-11=CPU TYPE
11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
11/70=06,PDQ=07,Q=10
BIT 10=REAL TIME CLOCK
BIT 9=FLOATING POINT PROCESSOR
BIT 8=MEMORY MANAGEMENT

MEM.TYPE BYTE -- (HIGH BYTE)
900 NSEC CORE=001
300 NSEC BIPOLAR=002
500 NSEC MOS=003

MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABO

THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
USED IN THE PROGRAM.

THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
NOTE1: IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
NOTE2: EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

```
EM              ;;POINTS TO THE ERROR MESSAGE
DH              ;;POINTS TO THE DATA HEADER
DT              ;;POINTS TO THE DATA
DF              ;;POINTS TO THE DATA FORMAT
```

```
INCREMENT THE PASS NUMBER ($PASS)
IF THERES A MONITOR GO TO IT
IF THERE ISN'T JUMP TO CYCLE

THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
SW14=1  LOOP ON TEST
SW11=1  INHIBIT ITERATIONS
CALL
        SCOPE           ;;SCOPE=IOT

ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
NOTE1:  $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
NOTE2:  $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
NOTE3:  $FILLC CONTAINS THE CHARACTER TO FILL AFTER.

CALL:
1) USING A TRAP INSTRUCTION
        TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
OR
        TYPE
        MESADR


ROUTINE USED TO SET UP THE DIAGNOSTIC VIA APT.
IF BIT7 IN THE ENVIRONMENT MODE ($ENVM) BYTE IS SET,
THE PROGRAM WILL LOAD ITS PARAMETERS FROM THE ETABLE.

ROUTINE USED TO "AUTO SIZE" THE DZV11
CSR AND VECTOR.
NOTE:   THE CSR MAY BE ANY WHERE IN THE FLOATING
        ADDRESS RANGE (160000:163770)
        AND THE VECTOR MAY BE ANY WHERE IN THE
        FLOATING VECTOR RANGE (300:770)


********************** TEST 1 **********************************
THIS TEST PROVES THE BUS REPLY RESPONSE
DURING A READ OR WRITE TO THE FOLLOWING ADDRESS:
        DZVCSR, DZVRBUF, DZVTCR, DZVMSR

********************** TEST 2 **********************************
THIS TEST PROVES THAT BIT "DCLR"
CAN BE SET AND THAT IT WILL CLEAR
BY ITSELF
```

```
;************************ TEST 3 ********************************
;TEST TO VERIFY THAT THE R/W BITS OF THE
;DZVCSR REGISTER CAN BE SET. THEN VERIFY THAT
;THESE BITS CAN BE CLEARED. AND FINALLY, VERIFY
;THAT AFTER BEING SET AGAIN THEY CAN BE
;CLEARED BY A "DEVICE CLEAR".
;THE BITS TESTED ARE:  MAINT, MSENAB, SILOEN,
;RIE, AND TIE.

;************************ TEST 4 ********************************
;THIS TESTS THAT ALL OF THE TCR BITS
;CAN BE: SET, CLEARED, AND CLEARED BY A DEVICE CLEAR.
;THIS TEST ALSO DETERMINES IF THE DTR BITS CAN
;BE SET, CLEARED, AND CLEARED BY A RESET.

;************************ TEST 5 ********************************
;THIS TEST VERIFIES THAT
;BITS "RDONE,TRDY, BIT9, BIT8,
;AND SILOAL" ARE READ ONLY AND THAT TRDY IS
;ZERO UNTIL A LINE IS SELECTED AND MSENAB IS SET.


;************************ TEST 6 ********************************
;THIS TEST VERIFIES THAT:
;TIE,SILOEN,RIE,MSENAB,AND MAINT ARE THE
;ONLY R/W BITS IN THE DZVCSR AND THAT
;SETTING "DCLR" IN THE CSR WILL CLEAR THESE BITS.

;************************ TEST 7 ********************************
;THIS TEST PERFORMS RESET TESTING AND
;TESTING OF READ ONLY REGISTER DZVRBUF
;AND TESTING OF WRITE ONLY REGISTER DZVLPR

;************************ TEST 10 *******************************
;THIS TEST PERFORMS RESET TESTING AND
;TESTING OF READ ONLY REGISTER DZVMSR
;AND TESTING OF WRITE ONLY REGISTER DZVTDR

;************************ TEST 11 *******************************
;VERIFY THAT SETTING "DTR" FOR A LINE WILL
;BRING UP "CO" AND "RING" FOR:
;THE SAME LINE IF IN EXTERNAL MODE
;THE STAGGERED LINE IF IN STAGGERED MODE.
;LINES ARE STAGGERED AS FOLLOWS:
;LINE0 WITH LINE1; LINE2 WITH LINE3.
;THIS TEST IS ONLY RUN IF AN H325,OR H329
;IS CONNECTED ON THE DZV UNDER TEST.

;************************ TEST 12 *******************************
; THIS TEST VERIFIES THAT TRDY IS SET WHEN A LINE
; IS READY TO BE LOADED, AND THAT THE LINE SPECI-
; FIED IN BITS 8-9 OF DZVCSR CORRESPOND
; TO THE LINE SELECTED IN DZVTCR
```

```
********************** TEST 13 **********************************
TEST TO TRANSMIT ONE CHAR AND
RECEIVE ONE CHAR ON ONE LINE
AT A TIME. THE CHAR IS "252" AND
ALL SELECTED LINES WILL BE TURNED ON .

THIS IS THE FIRST TIME ANY
DATA IS CHECKED IN THE RECEIVER.
USING SWITCH NINE WITH THIS TEST CREATES A TIGHT SCOPE LOOP
WHICH TRANSMITS A STEADY STREAM OF CHARACTERS.

********************** TEST 14 **********************************
THIS TEST VERIFIES THAT EACH RECEIVING LINE CAN BE
DISABLED BY SETTING RCVON (BIT12 IN THE LPR REGISTER)
TO ZERO FOR EACH LINE.
THIS TEST ALSO VERIFIES THAT THE SILO CAN BE
EMPTIED BY ISSUING A DEVICE MASTER CLEAR.

********************** TEST 15 **********************************
 THIS TEST PROVES THAT THE TRANSMITTER TRANSMITS
CHARACTERS (FLAG MODE)AND THE RECEIVER RECEIVES (FLAG MODE)
(ONE LINE AT A TIME  BASED UPON VALID LINES)
THIS IS THE FIRST TIME THAT ALL DATA IS CHECKED

********************** TEST 16 **********************************
THIS TEST WILL PROVE THAT:
 1) THE TRANSMITTER "BREAK BIT" WORKS
 2) THE RECEIVER CAN FLAG "FRAMING ERRORS"
 3) THE RECEIVER CAN FLAG "PARITY ERRORS"
ONLY ONE LINE AT A TIME WILL BE EXERCISED.

********************** TEST 17 **********************************
 THIS TEST VERIFIES THAT THE DEVICE DOES NOT INTERRUPT
WHILE THE PROCESSOR STATUS DOES NOT ALLOW INTERRUPTS
BUT WILL INTERRUPT IF THE PROCESSOR STATUS
ALLOWS INTERRUPTS.

********************** TEST 20 **********************************
THIS TEST VERIFIES THAT THE RECEIVER WILL
INTERRUPT BEFORE THE TRANSMITTER EVEN
THOUGH THE TRANSMITTER WAS ENABLED
FIRST.  SET PS TO HIGH (MASK INTERRUPTS);
GET RDONE AND TRDY TO SET;
SET TX IE AND RX IE;
CLEAR PS AND EXPECT RX TO INTERRUPT FIRST
```

&

```
                        ;;GPA   PRGFRT  ^?CVDZAB/<200>/FOUR LINE ASYNC MUX TESTS, PART 1 OF 2?,CVDZAB
                        ;;GPA   .HEADER <CNDZA-A>,<1982>
                        .TITLE  CNDZA-A
                        ;*COPYRIGHT (C) 1982
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                        ;*
000001                  $TN=1
                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;PRESS START
                                ;PROGRAM WILL TYPE
                                ;"CNDZAA/<200>/FOUR LINE ASYNC MUX TESTS, PART 1 OF 2"
                                ;PROGRAM WILL TYPE "RUNNING" TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                ;AND THEN RESUME TESTING

                        .REM    !
                        ;SWITCH REGISTER OPTIONS
                        ;----------------------


                        SW15=100000             ;=1,HALT ON ERROR
                        SW14=40000              ;=1,LOOP ON CURRENT TEST
                        SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
                        SW12=10000              ;=1,DELETE TYPEOUT/BELL ON ERROR.
                        SW11=4000               ;=1,INHIBIT ITERATIONS
                        SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
                        SW09=1000               ;=1,LOOP WITH CURRENT DATA
                        SW08=400                ;=1,LOOP ON ERROR
                        SW07=200                ;=1, DO "AUTO SIZING" ON INITAL START UP.
                        SW06=100                ;=1, DESELECT SPECIFIC DEVICES
                                                ;NOTE: THIS MUST NOT EXCEED ORIGINAL COUNT
                        SW05=40
                        SW04=20                 ;=1, SELECT DELAY PARAMETER
                        SW03=10                 ;=1, SELECT SPECIFIC PARAMETERS
                        SW02=4                  ;=1, LOCK ON TEST SELECT
                        SW01=2                  ;=1, RESTART PROGRAM AT SELECTED TEST
                        SW00=1                  ;=1, SELECT DEVICE ADDRESS, VECTOR, ETC.
                        !
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***
001120                  STACK=  1120
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                        ;*MISCELLANEOUS DEFINITIONS
000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                  LF=     12              ;;CODE FOR LINE FEED
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)                                   ;*****   THE FOLLOWING ODT START ADDRESS FOR SBC 11/21 IS ADDED
(2)          170000                   ODTST=   170000
(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)                                 ;*****  THE FOLLOWING BREAK VECTOR AND LINE CLOCK VECTOR ARE INCLUDED
(2)             000100              LKVEC=  100             ;;LINE CLOCK VECTOR
(2)             000140              BRKVEC= 140             ;;BREAK 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
(1)          022626                  POP2SP=22626    ;INCREMENT STACK TWICE
(1)          000200                  MASK=BIT7       ;SET INTERRUPT MASK (INHIBIT FURTHER INTERRUPTS)
(1)          000000                  CLEAR=0         ;ALLOW INTERRUPTS (CLEAR PROCESSOR STATUS)
(1)
(1)
(1)                                          ;DZV11 CONTROL AND STATUS REGISTER DEFINITIONS
(1)                                          ;(DZVCSR)       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)                                          ;DZVCSR 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)
(1)
(1)                                          ;DZVRBUF 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)                                          ;DZVRBUF 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)
(1)                                          ;DZVLPR 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)
(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)                                    ;DZVTCR BIT DEFINITIONS
(1)                                    ;----------------------
(1)            000001                  TCR0=BIT0               ;ENABLE TRANSMISSION ON LINE 0
(1)            000002                  TCR1=BIT1               ;ENABLE TRANSMISSION ON LINE 1
(1)            000004                  TCR2=BIT2               ;ENABLE TRANSMISSION ON LINE 2
(1)            000010                  TCR3=BIT3               ;ENABLE TRANSMISSION ON LINE 3
(1)            000400                  DTR0=BIT8               ;DATA TERMINAL READY FOR LINE 0
(1)            001000                  DTR1=BIT9               ;DATA TERMINAL READY FOR LINE 1
(1)            002000                  DTR2=BIT10              ;DATA TERMINAL READY FOR LINE 2
(1)            004000                  DTR3=BIT11              ;DATA TERMINAL READY FOR LINE 3
(1)
(1)                                    ;DZVMSR 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)            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)
(1)                                    ;DZVTDR 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)
(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)                                     ;       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 "PC+2 HALT".
(1)                             ;-----------------------------------------------------------------------------
(1)                             ;;*****************************************************************************
(1)
(1)             000000          .=0
(1)                                     ;STANDARD INTERRUPT VECTORS
(1)                                     ;-------------------------
(1)
(1)             000020          .=20
(1)   000020    004370                  .SCOPE                  ;SCOPE LOOP HANDLER
(1)   000022    000200                  MASK                    ;HANDLE AT PRIORITY 7
(1)   000024    007326                  $PWRDN                  ;POWER FAIL HANDLER
(1)   000026    000300                  300                     ;SERVICE AT PRIORITY LEVEL 6;VER:0
(1)   000030    006434                  $ERROR                  ;ERROR HANDLER
(1)   000032    000300                  300                     ;SERVICE AT PRIORITY LEVEL 6;VER:0
(1)   000034    006226                  .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
(1)   000036    000300                  300                     ;SERVICE AT PRIORITY LEVEL 6;VER:0
(2)                             .SBTTL  ACT11 HOOKS
(2)
(3)                             ;;*****************************************************************
(2)                             ;HOOKS REQUIRED BY ACT11
(2)             000040                  $SVPC=.                 ;SAVE PC
(2)             000046                  .=46
(2)   000046    004324                  $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  002116          JMP     .START          ;GO TO START OF PROGRAM
(1)
(2)
(2)             001000          .=1000
(2)   001000    005200  047103  055104  MTITLE: .ASCIZ  <200><12>/CNDZAA/<200>/FOUR LINE ASYNC MUX TESTS, PART 1 OF 2/<200>
(2)
```

```
(3)           001120                        .=1120
(4)                                         ;;*****************************************************************
(4)                                         .SBTTL  APT MAILBOX-ETABLE
(4)
(5)                                         ;;*****************************************************************
(4)                                         .EVEN
(4)  001120                                 $MAIL:                          ;;APT MAILBOX
(4)  001120  000000                         $MSGTY: .WORD   AMSGTY  ;;MESSAGE TYPE CODE
(4)  001122  000000                         $FATAL: .WORD   AFATAL  ;;FATAL ERROR NUMBER
(4)  001124  000000                         $TESTN: .WORD   ATESTN  ;;TEST NUMBER
(4)  001126  000000                         $PASS:  .WORD   APASS   ;;PASS COUNT
(4)  001130  000000                         $DEVCT: .WORD   ADEVCT  ;;DEVICE COUNT
(4)  001132  000000                         $UNIT:  .WORD   AUNIT   ;;I/O UNIT NUMBER
(4)  001134  000000                         $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
(4)  001136  000000                         $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
(4)  001140                                 $ETABLE:                        ;;APT ENVIRONMENT TABLE
(4)  001140     000                         $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
(4)  001141     000                         $ENVM:  .BYTE   AENVM
(4)                                         ;;ENVIRONMENT MODE BITS
(4)  001142  000000                         $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
(4)  001144  000000                         $USWR:  .WORD   AUSWR   ;;USER SWITCHES
(4)  001146  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)  001150     000                         $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
(4)  001151     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)  001152  000000                         $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
(4)                                         ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
(4)  001154     000                         $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
(4)  001155     000                         $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
(4)  001156  000000                         $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
(4)  001160     000                         $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
(4)  001161     000                         $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
(4)  001162  000000                         $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
(4)  001164     000                         $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
(4)  001165     000                         $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
(4)  001166  000000                         $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
(4)  001170  000300                         $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
(4)  001172  000000                         $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
(4)  001174  160010                         $BASE:  .WORD   ABASE
(4)                                         ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
(4)  001176  000001                         $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
(4)  001200  000017                         $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
(4)  001202  000000                         $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
(4)  001204  017470                         $DDW0:  .WORD   ADDW0   ;;DEVICE DESCRIPTOR WORD#0
(4)  001206  017470                         $DDW1:  .WORD   ADDW1   ;;DEVICE DESCRIPTOR WORD#1
(4)  001210  017470                         $DDW2:  .WORD   ADDW2   ;;DEVICE DESCRIPTOR WORD#2
(4)  001212  017470                         $DDW3:  .WORD   ADDW3   ;;DEVICE DESCRIPTOR WORD#3
```

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    (4)  001214  017470                  $DDW4:  .WORD   ADDW4   ;;DEVICE DESCRIPTOR WORD#4
    (4)  001216  017470                  $DDW5:  .WORD   ADDW5   ;;DEVICE DESCRIPTOR WORD#5
    (4)  001220  017470                  $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
    (4)  001222  017470                  $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
    (4)  001224  017470                  $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
    (4)  001226  017470                  $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
    (4)  001230  017470                  $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
    (4)  001232  017470                  $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
    (4)  001234  017470                  $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
    (4)  001236  017470                  $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
    (4)  001240  017470                  $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
    (4)  001242  017470                  $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
    (4)
    (4)
    (4)  001244                          $ETEND:
    (4)
```

```
(3)                                     .SBTTL  COMMON TAGS
(3)
(4)                                     ;;*************************************************************************
(3)                                     ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
(3)                                     ;*USED IN THE PROGRAM.
(3)
(3)   001244                            $CMTAG:                         ;;START OF COMMON TAGS
(3)   001244   000000                           .WORD   0
(3)   001246      000                   $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
(3)   001247      000                   $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
(3)   001250   000000                   $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
(3)   001252   000000                   $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
(3)   001254   000000                   $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
(3)   001256   000000                   $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
(3)   001260      000                   $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
(3)   001261      001                   $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
(3)   001262   000000                   $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
(3)   001264   000000                   $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
(3)   001266   000000                   $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
(3)   001270   000000                   $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
(3)   001272   000000                   $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
(3)   001274   000000                           .WORD   0               ;;RESERVED--NOT TO BE USED
(3)   001276   000000                           .WORD   0
(3)   001300      000                   $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
(3)   001301      000                   $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
(3)   001302   000000                           .WORD   0
(3)   001304   177570                   SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
(3)   001306   177570                   DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
(3)   001310   177560                   $TKS:   177560                  ;;TTY KBD STATUS
(3)   001312   177562                   $TKB:   177562                  ;;TTY KBD BUFFER
(3)   001314   177564                   $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
(3)   001316   177566                   $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
(3)   001320      000                   $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
(3)   001321      002                   $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
(3)   001322      012                   $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
(3)   001323      000                   $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
(3)   001324   000000                   $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
(3)                                                                     ;;WHICH  ($REG0) WAS OBTAINED
(5)   001326   000000                   $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
(5)   001330   000000                   $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
(5)   001332   000000                   $REG2:  .WORD   0               ;;CONTAINS (($REGAD)+4)
(5)   001334   000000                   $REG3:  .WORD   0               ;;CONTAINS (($REGAD)+6)
(5)   001336   000000                   $REG4:  .WORD   0               ;;CONTAINS (($REGAD)+10)
(5)   001340   000000                   $REG5:  .WORD   0               ;;CONTAINS (($REGAD)+12)
(5)   001342   000000                   $TMP0:  .WORD   0               ;;USER DEFINED
(5)   001344   000000                   $TMP1:  .WORD   0               ;;USER DEFINED
(5)   001346   000000                   $TMP2:  .WORD   0               ;;USER DEFINED
(5)   001350   000000                   $TMP3:  .WORD   0               ;;USER DEFINED
(5)   001352   000000                   $TMP4:  .WORD   0               ;;USER DEFINED
(3)   001354   000000                   $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
(3)   001356      077                   $QUES:  .ASCII  /?/             ;;QUESTION MARK
(3)   001357      015                   $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
(3)   001360   000012                   $LF:    .ASCIZ  <12>            ;;LINE FEED
```

```
    (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)  001362                     $ERRTB:
    (2)
    (2)                                     ;PROGRAM CONTROL PARAMETERS
    (2)                                     ;-------------------------
    (2)
    (2)  001362  000000             NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
    (2)  001364  000000             LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT TEST,TIGHT LOOP
    (2)
    (2)                                     ;PROGRAM VARIABLES
    (2)                                     ;-----------------
    (2)
    (2)  001366  000017             LINE:   17                      ;DEFAULT ALL FOUR LINES RUNNING
    (2)  001370  017470             PAR:    17470                   ;PARAMETERS: 8 BITS/CHAR,2 STOP BITS,19200 BAUD,NO PARIT
    (2)  001372  000000             MODE:   0                       ;DEFAULT MAINTENANCE MODE
    (2)  001374  000000             SAVLIN: 0                       ;LINE NUMBER
    (2)  001376  000000             XMTLIN: 0                       ;TRANSMISSION LINE NUMBER
    (2)  001400  000000             XMTCNT: 0                       ;COUNT OF WORDS IN A TRANSMISSION PATTERN
    (2)  001402  000000             REGIST: 0                       ;DEVICE ADDRESS STORAGE LOCATION
    (2)  001404  000000             SAVPC:  0                       ;PROGRAM COUNTER STORAGE
    (2)  001406  000001             DZVACTV:.BLKW   1               ;*DZV11'S SELECTED ACTIVE.
    (2)  001410  000001             SAVACTV:.BLKW   1               ;*A BIT MAP OF DZV11'S IN THE SYSTEM
    (2)  001412  000001             RUN:    1                       ;*POINTER ONE PAST RUNNING DEVICE.
    (2)  001414  000001             DZVNUM: .BLKB 1                 ;*OCTAL NUMBER OF DZV11'S IN THE SYSTEM
    (2)  001415     001             SAVNUM: .BYTE 1                 ;*WORKABLE NUMBER.
    (2)  001416  000001             SAVNO:  .BLKB   1               ;*OCTAL NO. OF DZV11'S BEING TESTED
    (2)          001420             .EVEN
    (2)  001420  001500             ACTIVE: DZV.MAP                 ;TABLE POINTER.
```

```
(2)
(2)                                     ;PROGRAM CONTROL FLAGS
(2)                                     ;--------------------
(2)
(2)  001422      000                    INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
(2)  001423      000                    HDRFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG FOR HEADER MAP
(2)  001424      000                    MNTFLG: .BYTE   0               ;MAINTENANCE BIT SET FLAG
(2)  001425      000                    DONFLG: .BYTE   0               ;TRANSMISSION COMPLETION FLAG
(2)                                     .EVEN
(2)                                     ;DATA VARIABLES
(2)  001426  000000                     TD0:    .WORD   0
(2)  001430  000000                     TD1:    .WORD   0
(2)  001432  000000                     TD2:    .WORD   0
(2)  001434  000000                     TD3:    .WORD   0
(2)  001436  000000                     TR0:    .WORD   0
(2)  001440  000000                     TR1:    .WORD   0
(2)  001442  000000                     TR2:    .WORD   0
(2)  001444  000000                     TR3:    .WORD   0
(2)  001446                             STOP:
(2)                                     .SBTTL  APT PARAMETER BLOCK
(2)
(3)                                     ;;*****************************************************************
(2)                                     ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(3)                                     ;;*****************************************************************
(2)          001446                             .$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  001446                             $APTHDR ;;POINT TO APT HEADER BLOCK
(2)          001446                             .=.$X   ;;RESET LOCATION COUNTER
(3)                                     ;;*****************************************************************
(2)                                     ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
(2)                                     ;INTERFACE SPEC.
(2)
(2)  001446                             $APTHD:
(2)  001446  000000                     $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
(2)  001450  001120                     $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
(2)  001452  000120                     $TSTM:  .WORD   80.     ;;RUN TIM OF LONGEST TEST
(2)  001454  000024                     $PASTM: .WORD   20.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
(2)  001456  000000                     $UNITM: .WORD   0.      ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
(2)  001460  000052                             .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
(1)                                             ;DZV11 STATUS TABLE AND ADDRESS ASSIGNMENTS
(1)                                             ;-----------------------------------------
(1)
(1)          001500             .=1500
(1)  001500                     DZV.MAP:
(3)
(3)  001500  000001             DZCR0:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 0
(3)  001502  000001             DZVC0:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 0
(3)  001504  000001             LINE0:  .BLKW   1       ;ALL LINES SELECTED
(3)  001506  000001             PAR0:   .BLKW   1       ;PARAMETERS
(3)  001510  000001             MANT0:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001512  000001             DZCR1:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 1
(3)  001514  000001             DZVC1:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 1
(3)  001516  000001             LINE1:  .BLKW   1       ;ALL LINES SELECTED
```

```
   (3)  001520  000001                PAR1:    .BLKW   1       ;PARAMETERS
   (3)  001522  000001                MANT1:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001524  000001                DZCR2:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 2
   (3)  001526  000001                DZVC2:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 2
   (3)  001530  000001                LINE2:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001532  000001                PAR2:    .BLKW   1       ;PARAMETERS
   (3)  001534  000001                MANT2:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001536  000001                DZCR3:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 3
   (3)  001540  000001                DZVC3:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 3
   (3)  001542  000001                LINE3:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001544  000001                PAR3:    .BLKW   1       ;PARAMETERS
   (3)  001546  000001                MANT3:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001550  000001                DZCR4:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 4
   (3)  C01552  000001                DZVC4:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 4
   (3)  001554  000001                LINE4:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001556  000001                PAR4:    .BLKW   1       ;PARAMETERS
   (3)  001560  000001                MANT4:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001562  000001                DZCR5:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 5
   (3)  001564  000001                DZVC5:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 5
   (3)  001566  000001                LINE5:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001570  000001                PAR5:    .BLKW   1       ;PARAMETERS
   (3)  001572  000001                MANT5:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001574  000001                DZCR6:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 6
   (3)  001576  000001                DZVC6:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 6
   (3)  001600  000001                LINE6:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001602  000001                PAR6:    .BLKW   1       ;PARAMETERS
   (3)  001604  000001                MANT6:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001606  000001                DZCR7:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 7
   (3)  001610  000001                DZVC7:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 7
   (3)  001612  000001                LINE7:   .BLKW   1       ;ALL LINES SELECTED
   (3)  001614  000001                PAR7:    .BLKW   1       ;PARAMETERS
   (3)  001616  000001                MANT7:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001620  000001                DZCR10:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 10
   (3)  001622  000001                DZVC10:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 10
   (3)  001624  000001                LINE10:  .BLKW   1       ;ALL LINES SELECTED
   (3)  001626  000001                PAR10:   .BLKW   1       ;PARAMETERS
   (3)  001630  000001                MANT10:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001632  000001                DZCR11:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 11
   (3)  001634  000001                DZVC11:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 11
   (3)  001636  000001                LINE11:  .BLKW   1       ;ALL LINES SELECTED
   (3)  001640  000001                PAR11:   .BLKW   1       ;PARAMETERS
   (3)  001642  000001                MANT11:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
   (3)
   (3)  001644  000001                DZCR12:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 12
   (3)  001646  000001                DZVC12:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 12
   (3)  001650  000001                LINE12:  .BLKW   1       ;ALL LINES SELECTED
   (3)  001652  000001                PAR12:   .BLKW   1       ;PARAMETERS
   (3)  001654  000001                MANT12:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
```

```
    (3)
    (3)  001656  000001                DZCR13: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 13
    (3)  001660  000001                DZVC13: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 13
    (3)  001662  000001                LINE13: .BLKW   1       ;ALL LINES SELECTED
    (3)  001664  000001                PAR13:  .BLKW   1       ;PARAMETERS
    (3)  001666  000001                MANT13: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001670  000001                DZCR14: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 14
    (3)  001672  000001                DZVC14: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 14
    (3)  001674  000001                LINE14: .BLKW   1       ;ALL LINES SELECTED
    (3)  001676  000001                PAR14:  .BLKW   1       ;PARAMETERS
    (3)  001700  000001                MANT14: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001702  000001                DZCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 15
    (3)  001704  000001                DZVC15: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 15
    (3)  001706  000001                LINE15: .BLKW   1       ;ALL LINES SELECTED
    (3)  001710  000001                PAR15:  .BLKW   1       ;PARAMETERS
    (3)  001712  000001                MANT15: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001714  000001                DZCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 16
    (3)  001716  000001                DZVC16: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 16
    (3)  001720  000001                LINE16: .BLKW   1       ;ALL LINES SELECTED
    (3)  001722  000001                PAR16:  .BLKW   1       ;PARAMETERS
    (3)  001724  000001                MANT16: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001726  000001                DZCR17: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 17
    (3)  001730  000001                DZVC17: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 17
    (3)  001732  000001                LINE17: .BLKW   1       ;ALL LINES SELECTED
    (3)  001734  000001                PAR17:  .BLKW   1       ;PARAMETERS
    (3)  001736  000001                MANT17: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (1)
    (1)  001740  177777                DZV.END:        177777
```

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(1)
(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)  001742                             .TRPTAB:
(3)       104400                        ADVANCE=TRAP+0          ;CALL TO ADVANCE TO NEXT TEST( OR SCOPE THIS ONE)
(2)  001742  006322                             .ADVANCE
(3)       104401                        SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
(2)  001744  004634                             .SCOP1
(3)       104402                        TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
(2)  001746  004660                             .TYPE
(3)       104403                        INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
(2)  001750  005426                             .INSTR
(3)       104404                        INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
(2)  001752  005532                             .INSTER
(3)       104405                        PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
(2)  001754  005552                             .PARAM
(3)       104406                        SETFLG=TRAP+6           ;CALL TO  SET FLAG ROUTINE
(2)  001756  010164                             .SETFLG
(3)       104407                        SAV05=TRAP+7            ;CALL TO REGISTER SAVE ROUTINE
(2)  001760  005752                             .SAV05
(3)       104410                        RES05=TRAP+10           ;CALL TO REGISTER RESTORE ROUTINE
(2)  001762  006012                             .RES05
(3)       104411                        CONVRT=TRAP+11          ;CALL TO DATA OUTPUT ROUTINE
(2)  001764  006044                             .CONVRT
(3)       104412                        CNVRT=TRAP+12           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
(2)  001766  006050                             .CNVRT
(3)       104413                        DEVICE.CLR=TRAP+13              ;CALL TO ISSUE A DEVICE CLEAR
(2)  001770  006250                             .DEVICE.CLR
(3)       104414                        DELAY=TRAP+14           ;CALL TO DELAY FOR FAST CPU'S
(2)  001772  006302                             .DELAY
(3)       104415                        PARMD=TRAP+15           ;CONVERT DECIMAL STRING TO OCTAL
(2)  001774  011170                             .PARMD
(3)       104416                        PAWCH=TRAP+16           ;SET FLAG    ECHO OR  CABLE
(2)  001776  010304                             .PAWCH
(3)       104417                        DCLASM=TRAP+17          ;CLEAR DEVICE, SET MAINT. BIT IF I MODE
(2)  002000  006270                             .DCLASM
(3)       104420                        SHIFT=TRAP+20           ;CALL TO ROTATE LINE POINTER
(2)  002002  006334                             .SHIFT
(3)       104421                        LPRSET=TRAP+21          ;CALL TO SET UP LPR DEVICE REGISTER
(2)  002004  006352                             .LPRSET
(3)       104422                        BUFSET=TRAP+22          ;CALL TO ZERO BUFFER AREA
(2)  002006  006412                             .BUFSET
(1)
(1)                                     ;-------------------------------------------------------------------------
(1)                                     ;:*************************************************************************
```

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(1)                                     ;DZV11 VECTOR AND REGISTER INDIRECT POINTERS
(1)                                     ;WORKING AREA
(1)
(1)  002010  160040                     DZVCSR: 160040  ;R/W
(1)  002012  160041                     HDZVCSR:160041  ;R/W
(1)  002014  160042                     DZVRBUF:160042  ;READ ONLY
(1)  002016  160043                     HDZVRBUF:160043 ;READ ONLY
(1)  002020  160042                     DZVLPR: 160042  ;WRITE ONLY
(1)  002022  160043                     HDZVLPR:160043  ;WRITE ONLY
(1)  002024  160044                     DZVTCR: 160044  ;R/W
(1)  002026  160045                     HDZVTCR:160045  ;R/W
(1)  002030  160046                     DZVMSR: 160046  ;READ ONLY
(1)  002032  160047                     HDZVMSR:160047  ;READ ONLY
(1)  002034  160046                     DZVTDR: 160046  ;WRITE ONLY
(1)  002036  160047                     HDZVTDR:160047  ;WRITE ONLY
(1)
(1)                                     ;DEFAULT DZV VECTORS
(1)
(1)  002040  000300                     DZVRIV: 300     ;REC INTR VECTOR
(1)  002042  000302                     DZVRIS: 302     ;REC INTR STATUS
(1)  002044  000304                     DZVTIV: 304     ;XMIT INTR VECTOR
(1)  002046  000306                     DZVTIS: 306     ;XMIT INTR STATUS
(1)
(1)
```

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(1)
(1)                                     ;TIME TABLE FOR RELATIVE TIMING TESTS
(1)                                     ;-----------------------------------
(1)
(1)  002050                         TMTBL:
(1)  002050  000000                 T50:    0
(1)  002052  000000                 T75:    0
(1)  002054  000000                 T110:   0
(1)  002056  000000                 T134:   0
(1)  002060  000000                 T150:   0
(1)  002062  000000                 T300:   0
(1)  002064  000000                 T600:   0
(1)  002066  000000                 T1200:  0
(1)  002070  000000                 T1800:  0
(1)  002072  000000                 T2000:  0
(1)  002074  000000                 T2400:  0
(1)  002076  000000                 T3600:  0
(1)  002100  000000                 T4800:  0
(1)  002102  000000                 T7200:  0
(1)  002104  000000                 T9600:  0
(1)  002106  000000                 TEIGHT:0
(1)  002110  000000                 TSEVEN: 0
(1)  002112  000000                 TSIX:   0
(1)  002114  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)  002116                           .START:
(1)  002116  000005                         RESET                       ;CLEAR THE WORLD. START NEW ENVIRONMENT
(1)  002120  012706  001120                 MOV     #STACK,SP           ;SET UP STACK
(1)  002124  106427  000200                 MTPS    #MASK               ;LOCK OUT INTERRUPTS
(1)  002130  012737  007326  000024         MOV     #$PWRDN,@#24        ;SET UP POWER FAIL VECTOR
(1)  002136  012737  006434  000030         MOV     #$ERROR,EMTVEC      ;SET UP ERROR VECTOR
(1)  002144  012737  000300  000032         MOV     #300,EMTVEC+2       ;VER:0
(1)  002152  005037  001126                 CLR     $PASS               ;CLEAR PASS COUNT
(1)  002156  105037  001247                 CLRB    $ERFLG              ;CLEAR ERROR FLAG
(1)  002162  012737  001500  001420         MOV     #DZV.MAP,ACTIVE     ;GET MAP POINTER.
(1)  002170  012737  000001  001412         MOV     #1,RUN              ;POINT POINTER TO FIRST DEVICE.
(1)  002176  005037  001256                 CLR     $ERTTL              ;CLEAR ERROR COUNT
(1)  002202  005037  001262                 CLR     $ERRPC              ;CLEAR LAST ERROR POINTER
(1)  002206  005037  001246                 CLR     $TSTNM              ;SET UP FOR TEST 1
(1)  002212  012737  002116  001252         MOV     #.START,$LPADR      ;SET UP FOR POWER FAIL BEFORE
(1)                                                                     ;TESTING STARTS
(1)                                         ;SET UP FOR SMALL 11 SWITCH REGISTER COMPATIBILITY
(1)  002220  012737  000176  001304         MOV     #SWREG,SWR          ;POINT TO SOFTWARE SWR
(1)  002226  012737  000174  001306         MOV     #DISPREG,DISPLAY    ;POINT TO SOFTWARE DISPLAY REGISTER
(1)                                   ;
(1)                                   ;THE FOLLOWING 3 LINES DELETED IN VER:0
(1)                                   ;       CALL    FALCON          ; CHECK FOR FALCON (KXT11)      ;;GPA
(1)                                   ;       BEQ     1000$           ; BR IF NOT                     ;;GPA
(1)  002234  004737  017254                  CALL    FALCINI         ; YES, INIT FOR FALCON          ;;GPA
(1)                                   ;       BIC     #40,EMTVEC+2    ; LOWER EMT TO 6.               ;;GPA
(1)  002240                           1000$:                                                          ;;GPA
(1)  002240  105737  001422                  TSTB    INIFLG              ;HAVE WE ALREADY BEEN HERE TODAY?
(1)  002244  001010                          BNE     10$                 ;IF SO, SKIP PRINTING THE TITLE
(1)  002246  023727  000042  004324          CMP     @#42,#$ENDAD        ;IF RUNNING UNDER ACT
(1)  002254  001402                          BEQ     1$                  ;DON'T PRINT TITLE
(1)  002256  104402  001000                  TYPE    ,MTITLE             ;PRINT THE DIAGNOSTIC'S TITLE
(1)  002262  105337  001422          1$:     DECB    INIFLG              ;SET THE ONCE ONLY FLAG
(1)  002266  105737  001141          10$:    TSTB    $ENVM               ;DETERMINE WHETHER APT SIZING SHOULD BE DONE
(1)  002272  100004                          BPL     15$                 ;IF NOT, GO CHECK FOR AUTO-SIZING
(1)  002274  004737  011172                  JSR     PC,SETAPT           ;OTHERWISE, GO DO APT SIZING FROM ETABLE
(1)  002300  000137  003614                  JMP     105$                ;GO PRINT DZV STATUS TABLE
(1)  002304  005737  000042          15$:    TST     @#42                ; CHAINED UNDER XXDP ??         ;;GPA
(1)  002310  001404                          BEQ     16$                 ; BR IF NOT                     ;;GPA
(1)  002312  004737  011172                  CALL    SETAPT              ; YES, SET-UP FROM ETABLE       ;;GPA
(1)  002316  000137  003614                  JMP     105$                ; AND PROCEED                   ;;GPA
(1)  002322  004737  007110          16$:    CALL    GETSWR              ; GET INITIAL SWITCH SETTING.   ;;GPA
(1)  002326  032777  000001  176750          BIT     #SW00,@SWR          ;RESELECT ?
(1)  002334  001002                          BNE     20$                 ;IF YES, GO SET UP THE INFORMATION
(1)  002336  000137  002640                  JMP     55$                 ;IF NO, SKIP THE INTERROGATION
(1)  002342  012700  001500          20$:    MOV     #DZV.MAP,R0         ;POINT TO THE BEGINNING OF THE MAP TABLE
(1)  002346  105037  001423                  CLRB    HDRFLG              ;MAKE SURE A MAP GETS PRINTED
(1)  002352  005020                  25$:    CLR     (R0)+               ;CLEAR A TABLE LOCATION
(1)  002354  020027  001740                  CMP     R0,#DZV.END         ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
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(1)  002360  001374                          BNE     25$             ;IF NOT ,CLEAR THE NEXT LOCATION IN THE TABLE
(1)  002362  105337  001422                  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 DZV11'S
(1)          002366                 GETCSR= .               ; POINTER FOR FALCON TWEAKER    ;;GPA
(2)  002366  104403                 INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002370  003060                 91$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002372  104405                 PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002374  160000                 160000                  ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002376  163770                 163770                  ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002400  001500                 DZCR0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002402     007                 .BYTE   7               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002403     001                 .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(1)  002404  013737  001500  001174  MOV     DZCR0,$BASE     ;COPY BASE ADDRESS TO ETABLE
(1)
(1)                                 ;GET THE BASE VECTOR ADDRESS
(1)          002412                 GETVEC= .               ; POINTER FOR FALCON TWEAKER    ;;GPA
(2)  002412  104403                 INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002414  003124                 92$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002416  104405                 PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002420  000300                 300                     ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002422  000776                 776                     ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002424  001502                 DZVC0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002426     003                 .BYTE   3               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002427     001                 .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(1)  002430  013737  001502  001170  MOV     DZVC0,$VECT1    ;COPY VECTOR TO ETABLE
(1)
(1)                                 ;GET THE MODE OF OPERATION (E,I,S)
(2)  002436  104403                 INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002440  003353                 96$                     ;POINTER TO THE MESSAGE TO BE PRINTED
(2)  002442  104406                 SETFLG                  ;CALL THE MAINTENANCE FLAG SETUP ROUTINE
(2)  002444  001510                 MANT0                   ;THIS IS THE FLAG BEING SETUP
(1)
(1)                                 ;GET THE NUMBER OF DZV11'S RUNNING
(2)  002446  104403                 INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002450  003310                 95$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002452  104405                 PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002454  000001                 1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002456  000020                 16.                     ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002460  001344                 $TMP1                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002462     000                 .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002463     001                 .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(1)
(1)  002464  012737  000017  001504  MOV     #17,LINE0       ;SET UP DEFAULT LINES
(1)  002472  012737  017470  001506  MOV     #17470,PAR0     ;SET UP DEFAULT LPR PARAMETER
(1)                                                         ;RECEIVER ON; 19.2 KBAUD; 2STOP BITS; 8 BIT/CHAR
(1)  002500  032777  000010  176576  BIT     #SW03,@SWR      ;DO YOU WANT PARAMETERS?
(1)  002506  001402                 BEQ     30$             ;IF NO, SKIP THE PARAMETER CALL
(1)  002510  004737  002670          JSR     PC,65$          ;GET PARAMETERS
(1)  002514  012737  000001  001410  30$:    MOV     #1,SAVACTV      ;INITIALIZE ACTIVE DEVICE SELECTION PARAMETER
(1)  002522  113737  001344  001414          MOVB    $TMP1,DZVNUM    ;COPY THE NUMBER OF DEVICES
(1)  002530  005337  001344          35$:    DEC     $TMP1           ;$TMP1 CONTAINS THE COUNT OF UNINITIALIZED
(1)  002534  001404                 BEQ     40$             ; SELECTED DEVICES
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(1)  002536  000261                          SEC                     ;SET A BIT FLAG TO INDICATE AN ACTIVE DEVICE
(1)  002540  006137  001410                   ROL     SAVACTV         ;POINT TO THE NEXT DEVICE
(1)  002544  000771                           BR      35$             ;GO DO THIS PROCEDURE AGAIN
(1)  002546  013737  001410  001346  40$:     MOV     SAVACTV,$TMP2   ;# OF TIMES
(1)  002554  012700  001500                   MOV     #DZCR0,R0       ;SET A POINTER TO THE SPECIFIED INFORMATION
(1)  002560  012701  001512                   MOV     #DZCR1,R1       ;POINT R1 TO THE REST OF THE MAP TABLE
(1)  002564  012702  001204                   MOV     #$DDW0,R2       ;POINT TO ETABLE'S DEVICE DESCRIPTOR WORDS
(1)  002570  000241                           CLC                     ;INITIALIZE THE "C" BIT FOR A ROTATION
(1)  002572  006037  001346                   ROR     $TMP2           ;SKIP MAPPING SETUP FOR DEVICE 0- IT'S DONE
(1)  002576  006237  001346           45$:    ASR     $TMP2           ;ISOLATE A SELECTION FLAG IN THE "C" BIT
(1)  002602  103404                           BCS     50$             ;IS THIS DEVICE SELECTED? IF YES, GO LOAD TABLE
(1)  002604  012711  177777                   MOV     #-1,(R1)        ;TERMINATE THE LIST
(1)  002610  000137  003556                   JMP     100$            ;GO TO THE NEXT BLOCK
(1)  002614  012011                   50$:    MOV     (R0)+,(R1)      ;ADDRESS
(1)  002616  062721  000010                   ADD     #10,(R1)+       ;POINT TO THE NEXT DZV11 ADDRESS VALUE
(1)  002622  012011                           MOV     (R0)+,(R1)      ;VECTOR
(1)  002624  062721  000010                   ADD     #10,(R1)+       ;POINT TO THE NEXT VECTOR VALUE
(1)  002630  012021                           MOV     (R0)+,(R1)+     ;LINES
(1)  002632  012021                           MOV     (R0)+,(R1)+     ;PARAMETERS
(1)  002634  012021                           MOV     (R0)+,(R1)+     ;MAINTENANCE MODE
(1)  002636  000757                           BR      45$
(1)  002640  032777  000010  176436   55$:    BIT     #SW03,@SWR      ;ASK PARAMETERS ?
(1)  002646  001002                           BNE     60$             ;IF NO, GO DO AUTO SIZING
(1)  002650  000137  003556                   JMP     100$            ;GO SET UP FOR AUTO SIZING
(1)  002654  004737  002670           60$:    JSR     PC,65$          ;GO ASK PARAMETERS
(1)  002660  105337  001422                   DECB    INIFLG          ;INSURE NO AUTO SIZE IF QUESTIONS ANSWERED
(1)  002664  000137  003614                   JMP     105$            ;GO TO THE NEXT BLOCK
(1)
(1)                                           ;GET THE ACTIVE LINES PARAMETER
(1)
(1)  002670                           65$:
(2)  002670  104403                           INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002672  003165                           93$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002674  104405                           PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002676  000001                           1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002700  000017                           17                      ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002702  001504                           LINE0                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002704     360                           .BYTE   360             ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002705     001                           .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(1)  002706  105037  001423                   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)  002712  005737  001510                   TST     MANT0           ;IS STAGGERED THE MODE OF OPERATION?
(1)  002716  100021                           BPL     85$             ;IF NOT, SKIP THIS SEGMENT
(1)  002720  013703  001504                   MOV     LINE0,R3        ;GET A SCRATCH COPY OF THE ACTIVE LINES
(1)  002724  006003                   70$:    ROR     R3              ;GET A LINE SELECTION BIT(EVEN NUMBER LINE)
(1)  002726  103410                           BCS     80$             ;IF IT IS SELECTED, CHECK TO SEE IF THE NEXT IS TOO
(1)  002730  001414                           BEQ     85$             ;IF ALL HAVE BEEN CHECKED, CONTINUE PROCESSING
(1)  002732  006203                           ASR     R3              ;IF IT IS 0,CHECK TO SEE IF THE NEXT IS TOO
(1)  002734  103373                           BCC     70$             ;IF THIS ONE'S 0 TOO, GO CHECK THE NEXT PAIR
(1)  002736  104402  001356           75$:    TYPE    ,$QUES          ;THIS IS AN INCORRECT PARAMETER
(1)  002742  104402  010110                   TYPE    ,MBADLN         ;LET THE USER KNOW ABOUT IT
(1)  002746  000750                           BR      65$             ;GO GET THE CORRECT PARAMETER
(1)  002750  001772                   80$:    BEQ     75$             ;IF ANOTHER FLAG ISN'T SET, THERE'S AN ERROR
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(1)  002752  006203                          ASR     R3              ;GET THE NEXT FLAG
(1)  002754  103370                          BCC     75$             ;IF IT ISN'T SET, THERE'S AN ERROR
(1)  002756  000241                          CLC                     ;INITIALIZE THE "C" BIT FOR TESTING OF THE NEXT PAIR
(1)  002760  000761                          BR      70$             ;GO TEST THE NEXT PAIR OF FLAGS
(1)
(1)                                           ;GET THE LINE PARAMETER REGISTER ARGUMENT
(1)
(1)  002762                           85$:
(2)  002762  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
(2)  002764  003240                          94$                     ;POINTER TO MESSAGE TO BE PRINTED
(2)  002766  104405                          PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  002770  000000                          0                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002772  000017                          17                      ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  002774  001506                          PAR0                    ;POINTER TO MAP LOCATION TO BE FILLED
(2)  002776     000                          .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  002777     001                          .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(1)  003000  012702  001504                  MOV     #LINE0,R2       ;POINT TO THE LINE SELECTION PARAMETER
(1)  003004  012703  001506                  MOV     #PAR0,R3        ;POINT TO THE CHOSEN PARAMETERS
(1)  003010  011304                          MOV     (R3),R4         ;USE BAUD RATE AS AN INDEX IN DELAY TABLE
(1)  003012  006304                          ASL     R4              ;ALIGN INDEX ON WORD BOUNDARY
(1)  003014  016437  017214  006320          MOV     DLYTBL(R4),DLYCNT ;SET THE DELAY COUNT FOR THIS BAUD RATE
(1)  003022  000313                          SWAB    (R3)            ;PLACE IN HIGH BYTE
(1)  003024  052713  010070                  BIS     #10070,(R3)     ;PLACE EXTRA PARAMETERS INTO LOC
(1)  003030  011262  000012           90$:   MOV     (R2),12(R2)     ;LOAD THE LINES
(1)  003034  011363  000012                  MOV     (R3),12(R3)     ;LOAD THE PARAMETERS
(1)  003040  062702  000012                  ADD     #12,R2          ;POINT TO THE NEXT SET
(1)  003044  062703  000012                  ADD     #12,R3          ; .. OF BOTH PARAMETERS
(1)  003050  020327  001734                  CMP     R3,#PAR17       ;HAVE THE TABLE BOUNDARIES BEEN EXCEEDED?
(1)  003054  001365                          BNE     90$             ;IF NOT, GO LOAD SOME MORE PARAMETERS
(1)  003056  000207                          RTS     PC              ;RETURN TO CALLING BLOCK
(1)  003060  030600  052123  041440   91$:   .ASCIZ  <200>/1ST CSR ADDRESS (160000:163770):  /
(1)  003124  030600  052123  053040   92$:   .ASCIZ  <200>/1ST VECTOR ADDRESS (300:770):  /
(1)  003165     200  044514  042516   93$:   .ASCIZ  <200>/LINES ACTIVE BY BIT <IN OCTAL>(001:17):  /
(1)  003240  042200  043105  052501   94$:   .ASCIZ  <200>/DEFAULT BAUD RATE <IN OCTAL>(00:17):  /
(1)  003310  021600  047440  020106   95$:   .ASCIZ  <200>/# OF DZV11'S <IN OCTAL> (1:20):  /
(1)  003353     200  040515  047111   96$:   .ASCII  <200>/MAINTENANCE MODE/
(1)  003374  020200  042533  052130          .ASCII  <200>/ [EXTERNAL  <H325>     (E)]/
(1)  003430  020200  044533  052116          .ASCII  <200>/ [INTERNAL  <DZVCSR03=1>(I)]/
(1)  003465     200  055440  052123          .ASCIZ  <200>/ [STAGGERED <H329>     (S)]: /
(1)  003524  042600  052116  051105   97$:   .ASCIZ  <200>/ENTER DELAY PARAMETER: /
(1)          003556                  .EVEN
(1)  003556                          100$:
(1)  003556  122737  000377  001422          CMPB    #377,INIFLG     ;ONLY DO AUTO SIZE ON 1ST START
(1)  003564  001013                          BNE     105$            ;
(1)  003566  032777  000200  175510          BIT     #BIT7,@SWR      ;BIT7=1??
(1)  003574  001007                          BNE     105$            ;BR IF NO AUTO SIZE
(1)  003576  005737  017532                  TST     KXTFLAG         ; FALCON ??                     ;;GPA
(1)  003602  001402                          BEQ     1002$           ; SKIP NEXT IF NOT.             ;;GPA
(1)  003604  000137  002342                  JMP     20$             ; YES, DON'T AUTO-SIZE.         ;;GPA
(1)  003610                          1002$:                                                          ;;GPA
(1)  003610  004737  011320                  JSR     PC,AUTO.SIZE    ;GO DO THE AUTO SIZE
(1)  003614  105737  001423          105$:   TSTB    HDRFLG          ;HAS THE TABLE BEEN TYPED YET?
(1)  003620  001021                          BNE     120$            ;IF SO, DON'T TYPE IT AGAIN
(1)  003622  105337  001423                  DECB    HDRFLG          ;INDICATE THAT THE TABLE WILL BE TYPED
(1)  003626  104402  010062                  TYPE    ,XHEAD          ;TYPE MAP HEADER
(1)  003632  012700  001500                  MOV     #DZV.MAP,R0     ;SET POINTER
```

```
(1)  003636  010037  001344          110$:  MOV     R0,$TMP1          ;POINT TO THE MAP LOCATION
(1)  003642  012037  001346                 MOV     (R0)+,$TMP2       ;SET DATA
(1)  003646  022737  177777  001346        CMP     #-1,$TMP2         ;END OF LIST?
(1)  003654  001403                         BEQ     120$              ;BR IF YES
(1)  003656  104411                 115$:   CONVRT                    ;CALL THE OCTAL TO ASCII CONVERSION ROUTINE
(1)  003660  010152                         XSTATQ                    ;CONVERT THE DATA AT THIS ADDRESS
(1)  003662  000765                         BR      110$              ;GO PRINT THE NEXT PARAMETER
(1)  003664  013737  001410  001406  120$:  MOV     SAVACTV,DZVACTV   ;COPY BIT MAP OF SYSTEM DEVICES ACTIVE
(1)  003672  113737  001414  001416        MOVB    DZVNUM,SAVNO      ;COPY NO. OF SYSTEM DEVICES ACTIVE
(1)  003700  032777  000100  175376        BIT     #SW06,@SWR        ;DESELECT SPECIFIC DEVICES??
(1)  003706  001431                         BEQ     135$              ;BR IF NO.
(1)  003710                         121$:
(2)  003710  104403                         INSTR                     ;CALL THE STRING INPUT ROUTINE
(2)  003712  010000                         MNEW                      ;POINTER TO MESSAGE TO BE PRINTED
(2)  003714  104405                         PARAM                     ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  003716  000001                         1                         ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003720  177777                         177777                    ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  003722  001406                         DZVACTV                   ;POINTER TO MAP LOCATION TO BE FILLED
(2)  003724     000                         .BYTE   0                 ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  003725     001                         .BYTE   1                 ;NUMBER OF PARAMETERS TO STORE
(1)  003726  023737  001406  001410        CMP     DZVACTV,SAVACTV   ;IS THE VALUE VALID?
(1)  003734  101403                         BLOS    122$              ;BRANCH IF YES
(1)  003736  104402  007652                TYPE    ,MERR3            ;IF NOT THEN TYPE ERROR
(1)  003742  000762                         BR      121$              ;GO REASK QUESTION
(1)  003744  105037  001416          122$:  CLRB    SAVNO             ;CLEAR NO. OF DEVICES BEING TESTED
(1)  003750  013737  001406  001344        MOV     DZVACTV,$TMP1     ;COPY BIT MAP OF ACTIVE DEVICES BEING TESTED
(1)  003756  006237  001344          126$:  ASR     $TMP1             ;SHIFT OUT AN ACTIVE BIT
(1)  003762  103002                         BCC     127$              ;IF NOT ACTIVE SKIP INCREMENT
(1)  003764  105237  001416                 INCB    SAVNO             ;IF ACTIVE RECORD IT
(1)  003770  001372                  127$:  BNE     126$              ;IF ALL ACTIVE BITS RECORDED DON'T BRANCH
(1)  003772  032777  000020  175304  135$:  BIT     #SW04,@SWR        ;CHECK TO SEE IF DELAY COUNT CHANGES
(1)  004000  001407                         BEQ     140$              ;IF NOT, GO CLEAR VECTOR AREA
(2)  004002  104403                         INSTR                     ;CALL THE STRING INPUT ROUTINE
(2)  004004  003524                         97$                       ;POINTER TO MESSAGE TO BE PRINTED
(2)  004006  104405                         PARAM                     ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(2)  004010  000001                         1                         ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  004012  177777                         177777                    ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(2)  004014  006320                         DLYCNT                    ;POINTER TO MAP LOCATION TO BE FILLED
(2)  004016     000                         .BYTE   0                 ;MASK OF INVALID BITS FOR THIS PARAMETER
(2)  004017     001                         .BYTE   1                 ;NUMBER OF PARAMETERS TO STORE
(1)  004020  012700  000300          140$:  MOV     #300,R0           ;PREPARE TO CLEAR THE FLOATING
(1)  004024  012701  000302                 MOV     #302,R1           ;VECTOR AREA. 300-776
(1)  004030  010120                  145$:  MOV     R1,(R0)+          ;START PUTTING 'PC+2 - HALT"
(1)  004032  005021                         CLR     (R1)+             ;IN VECTOR AREA.
(1)  004034  022021                         CMP     (R0)+,(R1)+       ;POP POINTERS
(1)  004036  005737  017532                 TST     KXTFLAG           ; IF FALCON...                    ;;GPA
(1)  004042  001403                         BEQ     1001$             ;                                 ;;GPA
(1)  004044  020027  000400                 CMP     R0,#400           ;...STOP AT 400.                  ;;GPA
(1)  004050  000402                         402                       ; SKIP NEXT                       ;;GPA
(1)  004052                         1001$:                            ;                                 ;;GPA
(1)  004052  022700  001000                 CMP     #1000,R0          ;ALL DONE??
(1)  004056  001364                         BNE     145$              ;BR IF NO.
(1)
(1)                                 ;TEST START AND RESTART
(1)                                 ;----------------------
(1)
```

PROGRAM INITIALIZATION AND START UP. SEQ 0042

```
   (1)  004060  012706  001120            .BEGIN: MOV     #STACK,SP       ;SET UP STACK
   (1)  004064  106427  000200                    MTPS    #MASK           ;LOCK OUT INTERRUPTS
   (1)  004070  005737  000042                    TST     @#42            ;IS PROGRAM UNDER MONITOR CONTROL
   (1)  004074  001015                            BNE     2$              ;BR IF YES
   (1)  004076  032777  000004  175200            BIT     #BIT2,@SWR      ;CHECK FOR LOCK ON TEST
   (1)  004104  001406                            BEQ     1$              ;BR IF NO LOCK DESIRED.
   (1)  004106  104402  007676                    TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
   (1)  004112  012737  000240  004402            MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
   (1)  004120  000403                            BR      2$              ;CONTINUE ALONG.
   (1)  004122  013737  004630  004402  1$:       MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
   (1)  004130  012737  010464  001252  2$:       MOV     #CYCLE,$LPADR   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
   (1)  004136  113737  001416  001415            MOVB    SAVNO,SAVNUM    ;COPY ACTIVE DEVICES BEING TESTED
   (1)  004144  104402  007567                    TYPE    ,MR             ;TYPE "RUNNING"
   (1)  004150  000177  175076                    JMP     @$LPADR         ;START TESTING
  8704                                    ;;GPA   PRGEND  DZV11,<END PASS CNDZA-A  >,10.
```

```
 8705                                           ;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)  004154                           $EOP:
  (5)  004154  000004                           SCOPE
  (5)  004156  005037  001262                   CLR     $ERRPC          ;CLEAR LAST ERROR PC
  (5)  004162  105037  001247                   CLRB    $ERFLG          ;CLEAR ERROR FLAG
  (5)  004166  104402  007543                   TYPE    ,MEPASS         ;TYPE END PASS
  (5)  004172  104402  007725                   TYPE    ,MCSRX          ;TYPE CSR
  (5)  004176  104412  004340                   CNVRT   ,XCSR           ;SHOW IT
  (5)  004202  104402  007733                   TYPE    ,MVECX          ;TYPE VECTOR
  (5)  004206  104412  004346                   CNVRT   ,XVEC           ;SHOW IT
  (5)  004212  005237  001126                   INC     $PASS           ;RAISE PASS COUNT
  (5)  004216  104402  007741                   TYPE    ,MPASSX         ;TYPE PASSES
  (5)  004222  104412  004354                   CNVRT   ,XPASS          ;SHOW IT
  (5)  004226  005337  001126                   DEC     $PASS           ;RESTORE PASS COUNT
  (5)  004232  104402  007752                   TYPE    ,MERRX          ;TYPE ERRORS
  (5)  004236  104412  004362                   CNVRT   ,XERR           ;SHOW IT
  (5)  004242  005237  001130                   INC     $DEVCT          ;INC DEVCNT FOR APT
  (5)  004246  105337  001415                   DECB    SAVNUM          ;ARE ALL DEVICES TESTED?
  (5)  004252  001030                           BNE     $DOAGN          ;BR IF NO.
  (5)  004254  113737  001416  001415           MOVB    SAVNO,SAVNUM    ;RESTORE THE COUNT
  (3)  004262  005037  001354                   CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
  (3)  004266  005237  001126                   INC     $PASS           ;;INCREMENT THE PASS NUMBER
  (3)  004272  042737  100000  001126           BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
  (3)  004300  005327                           DEC     (PC)+           ;;LOOP?
  (3)  004302  000001                   $EOPCT: .WORD   1
  (3)  004304  003013                           BGT     $DOAGN          ;;YES
  (3)  004306  012737                           MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
  (3)  004310  000001                   $ENDCT: .WORD   1
  (3)  004312  004302                           $EOPCT
  (3)  004314  013700  000042           $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
  (3)  004320  001405                           BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
  (3)  004322  000005                           RESET                   ;;CLEAR THE WORLD
  (3)  004324  004710                   $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
  (3)  004326  000240                           NOP                     ;;SAVE ROOM
  (3)  004330  000240                           NOP                     ;;FOR
  (3)  004332  000240                           NOP                     ;;ACT11
  (3)  004334                           $DOAGN:
  (3)  004334  000137                           JMP     @(PC)+          ;;RETURN
  (3)  004336  010464                   $RTNAD: .WORD   CYCLE
  (3)
  (3)
  (2)
  (2)  004340  000001                   XCSR:   1
  (2)  004342      006      002                 .BYTE   6,2
  (2)  004344  002010                           DZVCSR
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(2)  004346  000001                 XVEC:   1
(2)  004350     003      002                .BYTE   3,2
(2)  004352  002040                         DZVRIV
(2)  004354  000001                 XPASS:  1
(2)  004356     006      002                .BYTE   6,2
(2)  004360  001126                         $PASS
(2)  004362  000001                 XERR:   1
(2)  004364     006      002                .BYTE   6,2
(2)  004366  001256                         $ERTTL
(2)
(2)                                         ;SCOPE LOOP AND ITERATION HANDLER
(2)                                         ;-------------------------------
(2)
(3)                                 .SBTTL  SCOPE HANDLER ROUTINESTARS
(3)                                 ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
(3)                                 ;*AND LOAD THE TEST NUMBER($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)  004370                         $SCOPE:
(5)  004370  005037  001262         .SCOPE: CLR     $ERRPC          ;CLEAR LAST ERROR PC.
(5)  004374  022716  012026                 CMP     #TST1+2,(SP)    ;IS THIS THE SCOPE AT THE BEGINNING OF TST1?
(5)  004400  001413                         BEQ     $XTSTR          ;IF SO, DON'T LOOP ON IT
(5)  004402  000406                 TTST:   BR      1$              ;GOTO 1$    (IF LOCK SW02=1; THIS LOC =240)
(5)  004404  105777  174700                 TSTB    @$TKS           ;KEYBOARD DONE?
(5)  004410  100067                         BPL     $OVER           ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
(5)  004412  017766  174674  177776         MOV     @$TKB,-2(SP)    ;CLEAR DONE BIT
(3)  004420  032777  040000  174656 1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
(3)  004426  001060                         BNE     $OVER           ;;YES IF SW14=1
(3)                                 ;#####START OF CODE FOR THE XOR TESTER#####
(3)  004430  000416                 $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
(3)                                                                 ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
(3)  004432  013746  000004                 MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
(3)  004436  012737  004456  000004         MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
(3)  004444  005737  177060                 TST     @#177060        ;;TIME OUT ON XOR?
(3)  004450  012637  000004                 MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(3)  004454  000436                         BR      $SVLAD          ;;GO TO THE NEXT TEST
(3)  004456  022626                 5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
(3)  004460  012637  000004                 MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(3)  004464  000441                         BR      $OVER           ;;LOOP ON THE PRESENT TEST
(3)  004466                         6$:;#####END OF CODE FOR THE XOR TESTER#####
(3)  004466  105737  001247         2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
(3)  004472  001404                         BEQ     3$              ;;BR IF NO
(3)  004474  105037  001247         4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
(3)  004500  005037  001354                 CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(3)  004504  032777  004000  174572 3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
(3)  004512  001011                         BNE     1$              ;;BR IF YES
(3)  004514  005737  001126                 TST     $PASS           ;;IF FIRST PASS OF PROGRAM
(3)  004520  001406                         BEQ     1$              ;;      INHIBIT ITERATIONS
(3)  004522  005237  001250                 INC     $ICNT           ;;INCREMENT ITERATION COUNT
(3)  004526  023737  001354  001250         CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
(3)  004534  002015                         BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
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(3)  004536  012737  000001  001250  1$:     MOV     #1,$ICNT          ;;REINITIALIZE THE ITERATION COUNTER
(3)  004544  013737  004632  001354          MOV     $MXCNT,$TIMES     ;;SET NUMBER OF ITERATIONS TO DO
(3)  004552  105237  001246          $SVLAD: INCB    $TSTNM            ;;COUNT TEST NUMBERS
(3)  004556  113737  001246  001124          MOVB    $TSTNM,$TESTN     ;;SET TEST NUMBER IN APT MAILBOX
(3)  004564  011637  001252                  MOV     (SP),$LPADR       ;;SAVE SCOPE LOOP ADDRESS
(3)  004570  013777  001246  174510  $OVER:  MOV     $TSTNM,@DISPLAY   ;;DISPLAY TEST NUMBER
(3)  004576  013716  001252                  MOV     $LPADR,(SP)       ;;FUDGE RETURN ADDRESS
(5)  004602  004737  007062                  JSR     PC,SERV.G         ;FIND OUT IF ^G WAS TYPED
(5)  004606  105037  001424                  CLRB    MNTFLG            ;CLEAR THE MAINTENANCE BIT SETTER AFTER EACH TEST
(5)  004612  005737  001372                  TST     MODE              ;HAS THE MODE BEEN CHANGED?
(5)  004616  001003                          BNE     4$                ;IF NOT INTERNAL , GO DO A TEST
(5)  004620  112737  000010  001424          MOVB    #MAINT,MNTFLG     ;IF INTERNAL MODE NOW, SET THE MAINTENANCE BIT
(5)  004626  000002          4$:     RTI                               ;GO DO THE TEST
(5)  004630  000406          BRW:    406
(3)  004632  000005          $MXCNT: 5                                 ;;MAX. NUMBER OF ITERATIONS
(1)
(1)                                  ;CHECK FOR FREEZE ON CURRENT DATA
(1)                                  ;-------------------------------
(1)
(1)  004634  032777  001000  174442  .SCOP1: BIT     #SW09,@SWR        ;IS SW09=1(SET)?
(1)  004642  001405                          BEQ     1$                ;BR IF NOT SET.
(1)  004644  005737  001364                  TST     LOCK              ;IS THERE A TIGHT LOOP SPECIFIED?
(1)  004650  001402                          BEQ     1$                ;IF NO, RETURN
(1)  004652  013716  001364                  MOV     LOCK,(SP)         ;IF YES, GOTO THE ADDRESS IN LOCK.
(1)  004656  000002          1$:     RTI                               ;GO BACK.
(1)
(1)  004660  032777  010000  174416  .TYPE:  BIT     #SW12,@SWR        ;INHIBIT ALL PRINTOUT??
(1)  004666  001403                          BEQ     $TYPE             ;IF NOT, GO TYPE
(1)  004670  062716  000002                  ADD     #2,(SP)           ;SKIP OVER MESSAGE POINTER
(1)  004674  000002                          RTI                       ;RETURN TO WHERE PROCEDURE WAS INVOKED
(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)  004676  105737  001323          $TYPE:  TSTB    $TPFLG            ;;IS THERE A TERMINAL?
(2)  004702  100002                          BPL     1$                ;;BR IF YES
(2)  004704  000000                          HALT                      ;;HALT HERE IF NO TERMINAL
(2)  004706  000430                          BR      3$                ;;LEAVE
(2)  004710  010046          1$:     MOV     R0,-(SP)          ;;SAVE R0
(2)  004712  017600  000002                  MOV     @2(SP),R0         ;;GET ADDRESS OF ASCIZ STRING
(2)  004716  122737  000001  001140          CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
(2)  004724  001011                          BNE     62$               ;;NO,GO CHECK FOR APT CONSOLE
(2)  004726  132737  000100  001141          BITB    #APTSPOOL,$ENVM   ;;SPOOL MESSAGE TO APT
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(2)  004734  001405                        BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
(2)  004736  010037  004746                MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
(2)  004742  004737  005166                JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
(2)  004746  000000              61$:      .WORD   0               ;;MESSAGE ADDRESS
(2)  004750  132737  000040  001141 62$:  BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
(2)  004756  001003                        BNE     60$             ;;YES,SKIP TYPE OUT
(2)  004760  112046              2$:       MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(2)  004762  001005                        BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(2)  004764  005726                        TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(2)  004766  012600              60$:      MOV     (SP)+,R0        ;;RESTORE R0
(2)  004770  062716  000002      3$:       ADD     #2,(SP)         ;;ADJUST RETURN PC
(2)  004774  000002                        RTI                     ;;RETURN
(2)  004776  122716  000011      4$:       CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(2)  005002  001430                        BEQ     8$
(2)  005004  122716  000200                CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
(2)  005010  001006                        BNE     5$
(2)  005012  005726                        TST     (SP)+           ;;POP  <CR><LF> EQUIV
(2)  005014  104402                        TYPE                    ;;TYPE A CR AND LF
(2)  005016  001357                        $CRLF
(2)  005020  105037  005154                CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(2)  005024  000755                        BR      2$              ;;GET NEXT CHARACTER
(2)  005026  004737  005110      5$:       JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(2)  005032  123726  001322      6$:       CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(2)  005036  001350                        BNE     2$              ;;IF NO GO GET NEXT CHAR.
(2)  005040  013746  001320                MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(2)                                                                 ;;AND THE NULL CHAR.
(2)  005044  105366  000001      7$:       DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
(2)  005050  002770                        BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
(2)  005052  004737  005110                JSR     PC,$TYPEC       ;;GO TYPE A NULL
(2)  005056  105337  005154                DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(2)  005062  000770                        BR      7$              ;;LOOP
(2)
(2)                                     ;HORIZONTAL TAB PROCESSOR
(2)
(2)  005064  112716  000040      8$:       MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(2)  005070  004737  005110      9$:       JSR     PC,$TYPEC       ;;TYPE A SPACE
(2)  005074  132737  000007  005154        BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(2)  005102  001372                        BNE     9$              ;;TAB STOP
(2)  005104  005726                        TST     (SP)+           ;;POP SPACE OFF STACK
(2)  005106  000724                        BR      2$              ;;GET NEXT CHARACTER
(2)  005110  105777  174200      $TYPEC:   TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(2)  005114  100375                        BPL     $TYPEC
(2)  005116  116677  000002  174172        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(2)
(2)  005124  122766  000015  000002 CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(2)  005132  001003                        BNE     1$              ;;BRANCH IF NO
(2)  005134  105037  005154                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(2)  005140  000406                        BR      $TYPEX          ;;EXIT
(2)  005142  122766  000012  000002 1$:    CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(2)  005150  001402                        BEQ     $TYPEX          ;;BRANCH IF YES
(2)  005152  105227                        INCB    (PC)+           ;;COUNT THE CHARACTER
(2)  005154  000000              $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
(2)  005156  000207              $TYPEX: RTS     PC
(2)
(2)
(2)
```

```
(2)                                     .SBTTL  APT COMMUNICATIONS ROUTINE
(2)
(3)                                     ;;*****************************************************************
(2)  005160  112737  000001  005424  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
(2)  005166  112737  000001  005422  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
(2)  005174  000403                          BR      $ATYC
(2)  005176  112737  000001  005424  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
(2)  005204                          $ATYC:
(4)  005204  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  005206  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(2)  005210  105737  005422                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
(2)  005214  001450                          BEQ     5$              ;;IF NOT:  BR
(2)  005216  122737  000001  001140          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
(2)  005224  001031                          BNE     3$              ;;IF NOT:  BR
(2)  005226  132737  000100  001141          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
(2)  005234  001425                          BEQ     3$              ;;IF NOT:  BR
(2)  005236  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
(2)  005242  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(2)  005250  005737  001120          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
(2)  005254  001375                          BNE     1$              ;;IF NOT:  WAIT
(2)  005256  010037  001134                  MOV     R0,$MSGAD
(2)                                  ;;PUT ADDR IN MAILBOX
(2)  005262  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
(2)  005264  001376                          BNE     2$
(2)  005266  163700  001134                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
(2)  005272  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
(2)  005274  010037  001136                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
(2)  005300  012737  000004  001120          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
(2)  005306  000413                          BR      5$
(2)  005310  017637  000004  005334  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
(2)  005316  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
(4)  005324  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
(2)  005330  004737  004676                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
(2)  005334  000000                  4$:     .WORD   0
(2)  005336                          5$:
(2)  005336  105737  005424          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
(2)  005342  001416                          BEQ     12$             ;;IF NOT:  BR
(2)  005344  005737  001140                  TST     $ENV            ;;RUNNING UNDER APT?
(2)  005350  001413                          BEQ     12$             ;;IF NOT:  BR
(2)  005352  005737  001120          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
(2)  005356  001375                          BNE     11$             ;;IF NOT:  WAIT
(2)  005360  017637  000004  001122          MOV     @4(SP),$FATAL   ;;GET ERROR #
(2)  005366  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(2)  005374  005237  001120                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
(2)  005400  105037  005424          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
(2)  005404  105037  005423                  CLRB    $LFLG           ;;CLEAR LOG FLAG
(2)  005410  105037  005422                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
(4)  005414  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(4)  005416  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(2)  005420  000207                          RTS     PC              ;;RETURN
(2)  005422     000                  $MFLG:  .BYTE   0               ;;MESSG. FLAG
(2)  005423     000                  $LFLG:  .BYTE   0
(2)                                          ;;LOG FLAG
(2)  005424     000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
(2)          005426                          .EVEN
(2)          000200                  APTSIZE=200
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(2)           000001                  APTENV=001
(2)           000100                  APTSPOOL=100
(2)           000040                  APTCSUP=040
(1)
(1)                                   ;STRING INPUT ROUTINE
(1)                                   ;--------------------
(1)
(1)  005426  010346                .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
(1)  005430  010446                        MOV     R4,-(SP)        ;SAVE R4 ON STACK
(1)  005432  017637  000004 005450         MOV     @4(SP),.MSG     ;GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
(1)  005440  062766  000002 000004         ADD     #2,4(SP)        ;POINT TO INSTRUCTION AFTER ADDRESS POINTER
(1)  005446  104402                .INST1: TYPE                    ;PRINT THE MESSAGE
(1)  005450  000000                .MSG:   0                       ;MESSAGE IS POINTED TO FROM HERE
(1)  005452  012704  010360                MOV     #INBUF,R4       ;POINT R4 TO THE INPUT BUFFER
(1)  005456  012703  000007                MOV     #7,R3           ;SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
(1)  005462  105777  173622        1$:     TSTB    @$TKS           ;HAS A CHARACTER BEEN RECEIVED?
(1)  005466  100375                        BPL     1$              ;IF NO, KEEP WAITING FOR IT
(1)  005470  117714  173616                MOVB    @$TKB,(R4)      ;IF YES, SAVE IT IN THE INPUT BUFFER
(1)  005474  142714  000200                BICB    #200,(R4)       ;KEEP ONLY THE 7-BIT ASCII INFORMATION
(1)  005500  122427  000015                CMPB    (R4)+,#15       ;IS THIS CHARACTER A LINE FEED?
(1)  005504  001417                        BEQ     INSTR2          ;IF SO, TERMINATE THE INPUT SEQUENCE
(1)  005506  105777  173602        2$:     TSTB    @$TPS           ;IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
(1)  005512  100375                        BPL     2$              ;IF WE CAN'T, WAIT UNTIL WE CAN
(1)  005514  017777  173572 173574         MOV     @$TKB,@$TPB     ;ECHO THE CHARACTER BACK
(1)  005522  005303                        DEC     R3              ;REDUCE THE NUMBER OF CHARACTERS RECEIVED
(1)  005524  001356                        BNE     1$              ;IF WE DON'T HAVE 7, GO GET SOME MORE
(1)  005526  012604                        MOV     (SP)+,R4        ;IF WE HAVE 7, RESTORE R4
(1)  005530  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  005532  010346                .INSTE: MOV     R3,-(SP)        ;SAVE R3 ON THE STACK
(1)  005534  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  005536  104402  001356                TYPE    ,$QUES          ;PRINT A QUESTION MARK... WHAT'S GOING ON?
(1)  005542  000741                        BR      .INST1          ;GO PRINT THE MESSAGE AGAIN
(1)  005544  012604                INSTR2: MOV     (SP)+,R4        ;RESTORE R4
(1)  005546  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  005550  000002                        RTI                     ;RETURN TO THE MAIN PROCEDURE
(1)
(1)                                   ;CONVERT ASCII STRING TO OCTAL
(1)                                   ;----------------------------
(1)
(1)  005552  010546                .PARAM: MOV     R5,-(SP)        ;SAVE R5 ON THE STACK
(1)  005554  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  005556  016605  000004                MOV     4(SP),R5        ;GET THE SETUP INFORMATION POINTER
(1)  005562  012537  005742                MOV     (R5)+,LOLIM     ;SET THE LOW LIMIT FOR THE INPUT
(1)  005566  012537  005744                MOV     (R5)+,HILIM     ;SET THE HIGH LIMIT FOR THE INPUT
(1)  005572  012537  005746                MOV     (R5)+,DEVADR    ;SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
(1)  005576  112537  005750                MOVB    (R5)+,LOBITS    ;GET THE MASK OF THE INCORRECT BITS
(1)  005602  112537  005751                MOVB    (R5)+,ADRCNT    ;GET THE COUNT OF ITEMS TO BE STORED
(1)  005606  010566  000004                MOV     R5,4(SP)        ;POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
(1)  005612  005005                PARAM1: CLR     R5              ;INITIALIZE THE ASCII TO OCTAL RESULT WORD
(1)  005614  012704  010360                MOV     #INBUF,R4       ;POINT TO THE INPUT BUFFER
(1)  005620  122714  000015                CMPB    #15,(R4)        ;IS THIS CHARACTER A CARRIAGE RETURN?
(1)  005624  001420                        BEQ     PARERR          ;IF SO, PRINT THE MESSAGE AGAIN
(1)  005626  121427  000060        1$:     CMPB    (R4),#60        ;IS THIS CHARACTER BELOW THE NUMERIC RANGE?
(1)  005632  002415                        BLT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  005634  121427  000067                CMPB    (R4),#67        ;IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
(1)  005640  003012                        BGT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
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(1)  005642  142714  000060          BICB    #60,(R4)        ;ISOLATE THE NUMBER THE CHARACTER REPRESENTS
(1)  005646  152405                  BISB    (R4)+,R5        ;CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
(1)  005650  122714  000015          CMPB    #15,(R4)        ;IS THE NEXT CHARACTER A CARRIAGE RETURN?
(1)  005654  001406                  BEQ     LIMITS          ;IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
(1)  005656  006305                  ASL     R5              ;CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
(1)  005660  006305                  ASL     R5              ;CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
(1)  005662  006305                  ASL     R5              ;MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
(1)                                                          ;NEXT THREE BITS
(1)  005664  000760                  BR      1$              ;GO GET THE NEXT CHARACTER
(1)  005666  104404          PARERR: INSTER                  ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
(1)  005670  000750                  BR      PARAM1          ;TRY GETTING THE PARAMETERS AGAIN
(1)
(1)                                  ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(1)                                  ;--------------------------------------
(1)
(1)  005672  020537  005744  LIMITS: CMP     R5,HILIM        ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
(1)  005676  101373                  BHI     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  005700  020537  005742          CMP     R5,LOLIM        ;IS THE RESULT LOWER THAN ALLOWED?
(1)  005704  103770                  BLO     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  005706  133705  005750          BITB    LOBITS,R5       ;ARE ANY INCORRECT BITS SET IN THE RESULT?
(1)  005712  001365                  BNE     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)
(1)                                  ;STORE NUMBER AT SPECIFIED ADDRESS
(1)
(1)  005714  013704  005746          MOV     DEVADR,R4       ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
(1)  005720  010524          1$:     MOV     R5,(R4)+        ;STORE THE RESULT
(1)  005722  062705  000002          ADD     #2,R5           ;CALCULATE THE NEXT DATUM
(1)  005726  105337  005751          DECB    ADRCNT          ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
(1)  005732  001372                  BNE     1$              ;IF NOT, GO STORE THE NEXT DATUM
(1)  005734  012604                  MOV     (SP)+,R4        ;RESTORE R4
(1)  005736  012605                  MOV     (SP)+,R5        ;RESTORE R5
(1)  005740  000002                  RTI                     ;RETURN TO THE MAIN PROGRAM
(1)
(1)  005742  000000          LOLIM:  0                       ;LOWEST ACCEPTABLE VALUE
(1)  005744  000000          HILIM:  0                       ;HIGHEST ACCEPTABLE
(1)  005746  000000          DEVADR: 0                       ;LOCATION WHERE RESULT WILL BE STORED
(1)  005750     000          LOBITS: .BYTE   0               ;INCORRECT BITS MASK
(1)  005751     000          ADRCNT: .BYTE   0               ;COUNT OF ITEMS TO BE STORED
(1)
(1)                                  ;SAVE PC OF TEST THAT FAILED AND R0-R5
(1)                                  ;-------------------------------------
(1)
(1)  005752  016637  000004  001404  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
(1)
(1)                                  ;SAVE R0-R5
(1)
(1)  005760  010537  001340          SV05:   MOV     R5,$REG5        ;SAVE R5
(1)  005764  010437  001336                  MOV     R4,$REG4        ;SAVE R4
(1)  005770  010337  001334                  MOV     R3,$REG3        ;SAVE R3
(1)  005774  010237  001332                  MOV     R2,$REG2        ;SAVE R2
(1)  006000  010137  001330                  MOV     R1,$REG1        ;SAVE R1
(1)  006004  010037  001326                  MOV     R0,$REG0        ;SAVE R0
(1)  006010  000002                  RTI                     ;LEAVE.
(1)
(1)                                  ;RESTORE R0-R5
(1)
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(1)  006012  013700  001326          .RES05: MOV     $REG0,R0        ;RESTORE R0
(1)  006016  013701  001330                  MOV     $REG1,R1        ;RESTORE R1
(1)  006022  013702  001332                  MOV     $REG2,R2        ;RESTORE R2
(1)  006026  013703  001334                  MOV     $REG3,R3        ;RESTORE R3
(1)  006032  013704  001336                  MOV     $REG4,R4        ;RESTORE R4
(1)  006036  013705  001340                  MOV     $REG5,R5        ;RESTORE R5
(1)  006042  000002                          RTI                     ;LEAVE
(1)
(1)                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
(1)                                          ;-----------------------------------------------------
(1)
(1)  006044  104402  001357          .CONVR: TYPE    ,$CRLF          ;PRINT A CARRIAGE RETURN
(1)  006050  010046                  .CNVRT: MOV     R0,-(SP)        ;SAVE R0
(1)  006052  010146                          MOV     R1,-(SP)        ;SAVE R1
(1)  006054  010346                          MOV     R3,-(SP)        ;SAVE R3
(1)  006056  010446                          MOV     R4,-(SP)        ;SAVE R4
(1)  006060  010546                          MOV     R5,-(SP)        ;SAVE R5
(1)  006062  017601  000012                  MOV     @12(SP),R1      ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
(1)  006066  062766  000002  000012          ADD     #2,12(SP)       ;POINT TO WHERE MAIN PROGRAM WILL RESUME
(1)  006074  012137  006220                  MOV     (R1)+,WRDCNT    ;GET NUMBER OF WORDS TO BE PRINTED
(1)  006100  112105                  1$:     MOVB    (R1)+,R5        ;GET THE NUMBER OF CHARACTERS TO BE PRINTED
(1)  006102  112100                          MOVB    (R1)+,R0        ;GET THE NUMBER OF SPACES TO PRINT
(1)  006104  013104                          MOV     @(R1)+,R4       ;COPY THE WORD TO BE CONVERTED
(1)  006106  110537  006222                  MOVB    R5,CHRCNT       ;COPY THE CHARACTER COUNT
(1)  006112  010403                  3$:     MOV     R4,R3           ;COPY THE ARGUMENT WORD AGAIN
(1)  006114  042703  177770                  BIC     #^C<7>,R3       ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
(1)  006120  062703  000060                  ADD     #060,R3         ;MAKE AN ASCII CHARACTER OUT OF THEM
(1)  006124  110346                          MOVB    R3,-(SP)        ;SAVE THAT CHARACTER
(1)  006126  006004                          ROR     R4              ;MOVE THE NEXT THREE BITS INTO PLACE
(1)  006130  006204                          ASR     R4              ;MOVE THEM AGAIN
(1)  006132  006204                          ASR     R4              ;AND FINALLY A THIRD TIME
(1)  006134  005305                          DEC     R5              ;REDUCE CHARACTER COUNT.ARE ALL CHARACTERS
(1)                                                                  ;BUILT?
(1)  006136  001365                          BNE     3$              ;IF NO, GO BUILD THE NEXT ONE.
(1)  006140  012703  010422                  MOV     #MDATA,R3       ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
(1)  006144  112623                  4$:     MOVB    (SP)+,(R3)+     ;STORE THE CHARACTER, STARTING WITH THE MOST
(1)  006146  105337  006222                  DECB    CHRCNT          ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
(1)  006152  001374                          BNE     4$              ;IF NO, GO TRANSFER ANOTHER
(1)  006154  105700                          TSTB    R0              ;ARE ANY SPACES TO BE PRINTED?
(1)  006156  001404                          BEQ     6$              ;IF NO, DON'T SET UP ANY
(1)  006160  112723  000040          5$:     MOVB    #040,(R3)+      ;ADD A SPACE TO THE OUTPUT BUFFER
(1)  006164  105300                          DECB    R0              ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
(1)  006166  001374                          BNE     5$              ;IF YES, GO ADD ANOTHER SPACE
(1)  006170  105013                  6$:     CLRB    (R3)            ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
(1)  006172  104402  010422                  TYPE    ,MDATA          ;PRINT THE STRING WE JUST BUILT
(1)  006176  005337  006220                  DEC     WRDCNT          ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
(1)  006202  001336                          BNE     1$              ;IF YES, GO CONVERT THEM
(1)  006204  012605                          MOV     (SP)+,R5        ;RESTORE R5
(1)  006206  012604                          MOV     (SP)+,R4        ;RESTORE R4
(1)  006210  012603                          MOV     (SP)+,R3        ;RESTORE R3
(1)  006212  012601                          MOV     (SP)+,R1        ;RESTORE R1
(1)  006214  012600                          MOV     (SP)+,R0        ;RESTORE R0
(1)  006216  000002                          RTI                     ;RETURN TO THE MAIN PROGRAM
(1)  006220  000000          WRDCNT: 0
(1)  006222     000          CHRCNT: .BYTE                           ;NUMBER OF CHARACTERS TO PRINT
(1)  006223     000          SPACNT: .BYTE   0                       ;NUMBER OF SPACES TO PRINT
```

```
(1)
(1)  006224  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)  006226  010046                  .TRPSR: MOV     R0,-(SP)        ;SAVE R0. USE R0 TO FIND TRAP ROUTINE
(1)  006230  016600  000002                  MOV     2(SP),R0        ;GET TRAP ADDRESS
(1)  006234  005740                          TST     -(R0)           ;GET TRAP
(1)  006236  111000                          MOVB    (R0),R0         ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
(1)  006240  006300                          ASL     R0              ;POSITION OFFSET FOR TABLE INDEXING
(1)  006242  016000  001742                  MOV     .TRPTAB(R0),R0  ;PLACE INDEXED ADDRESS OF TABLE IN R0
(1)  006246  000200                          RTS     R0              ;TRANSFER TO THAT ADDRESS AND RESTORE OLD R0
(1)
(1)                                           ;DEVICE CLEAR ROUTINE
(1)                                           ;ISSUE A DEVICE CLEAR
(1)                                           ;--------------------
(1)  006250                          .DEVICE.CLR:
(1)  006250  052777  000020  173532          BIS     #DCLR,@DZVCSR   ;SET DCLR
(1)  006256  032777  000020  173524  1$:     BIT     #DCLR,@DZVCSR   ;DID IT CLEAR?
(1)  006264  001374                          BNE     1$              ;BR IF NO
(1)  006266  000002                          RTI                     ;EXIT ROUTINE
(1)
(1)                                           ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
(1)                                           ;-------------------------------------------------------------
(1)  006270  104413                  .DCLASM:DEVICE.CLR              ;ISSUE A DEVICE CLEAR
(1)  006272  153777  001424  173510          BISB    MNTFLG,@DZVCSR  ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
(1)  006300  000002                          RTI                     ;RETURN TO CALLING ROUTINE
(1)
(1)  006302                          .DELAY:
(1)  006302  010046                          MOV     R0,-(SP)        ;SAVE R0
(1)  006304  013700  006320                  MOV     DLYCNT,R0       ;SET COUNT
(1)  006310  005300                  1$:     DEC     R0              ;DELAY
(1)  006312  001376                          BNE     1$              ;
(1)  006314  012600                          MOV     (SP)+,R0        ;RESTORE R0
(1)  006316  000002                          RTI                     ;LEAVE ROUTINE
(1)  006320  000001                  DLYCNT: .WORD     1             ;PATCHABLE LOC FOR MORE TIME
(1)
(1)                                           ;ADVANCE TO NEXT TEST HANDLER
(1)                                           ;---------------------------
(1)
(1)  006322  013716  001362          .ADVANCE:MOV    NEXT,(SP)       ;CRUNCH STACK WITH ADDRESS OF SCOPE CALL
(1)  006326  005037  001364                  CLR     LOCK            ;RESET TIGHT LOOP ADDRESS
(1)  006332  000002                          RTI                     ;CHECK TO SEE IF OLD TEST GETS REPEATED
(1)
(1)                                           ;ROUTINE TO SHIFT LINE POINTER
(1)                                           ;AND SWITCH TESTS IF NECESSARY
(1)                                           ;----------------------------
(1)  006334  106302                  .SHIFT: ASLB    R2              ;POINT TO THE NEXT LINE
(1)  006336  032702  000020                  BIT     #BIT4,R2        ;HAVE WE PASSED ALL LINE POINTERS?
(1)  006342  001402                          BEQ     1$              ;IF NOT, RETURN TO THE TEST
(1)  006344  022626                          POP2SP                  ;REMOVE THE TRAP CALL FROM THE STACK
(1)  006346  104400                          ADVANCE                 ;GO TO THE NEXT TEST
```

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   (1)  006350  000002                1$:     RTI                     ;RETURN TO THE PRESENT TEST
   (1)
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(1)                                             ;LINE PARAMETER REGISTER SETUP ROUTINE
(1)
(1)  006352  010146                  .LPRSET:MOV     R1,-(SP)        ;SAVE CONTENTS OF R1
(1)  006354  010246                          MOV     R2,-(SP)        ;SAVE CONTENTS OF R2
(1)  006356  013701  001370                  MOV     PAR,R1          ;MOVE DEFAULT PARAM. INTO R1
(1)  006362  012702  000001                  MOV     #1,R2   ;INIT. FOR LINE 1
(1)  006366  010177  173426          1$:     MOV     R1,@DZVLPR      ;LOAD PARAM. REGISTER
(1)  006372  005201                          INC     R1              ;SET R1 FOR NEXT LINE
(1)  006374  106302                          ASLB    R2              ;SET R2 FOR NEXT LINE
(1)  006376  032702  000020                  BIT     #BIT4,R2        ;ALL LINES DONE?
(1)  006402  001771                          BEQ     1$              ;IF NO LOAD NEXT LINE
(1)  006404  012602                          MOV     (SP)+,R2        ;RELOAD R2
(1)  006406  012601                          MOV     (SP)+,R1        ;RELOAD R1
(1)  006410  000002                          RTI                     ;RETURN
(1)
(1)                                             ;ROUTINE TO ZERO DATA BUFFER
(1)
(1)  006412  010046                  .BUFSET:MOV     R0,-(SP)        ;SAVE CONTENTS OF R0
(1)  006414  012700  001426                  MOV     #TDO,R0         ;SET R0 TO TOP OF BUFFER
(1)  006420  005020                  1$:     CLR     (R0)+           ;CLEAR BUFFER LOCATION
(1)  006422  022700  001446                  CMP     #STOP,R0        ;IS BUFFER ALL CLEARED
(1)  006426  001374                          BNE     1$              ;IF NOT CLEAR NEXT LOCATION
(1)  006430  012600                          MOV     (SP)+,R0        ;RELOAD R0
(1)  006432  000002                          RTI                     ;RETURN
(1)
(1)                                             ;ERROR HANDLER
(1)                                             ;-------------
(1)
(1)  006434  004737  007062          $ERROR: JSR     PC,SERV.G       ;FIND OUT IF <^G> WAS HIT
(1)  006440  032777  010000  172636          BIT     #SW12,@SWR      ;BELL ON ERROR?
(1)  006446  001406                          BEQ     XBX             ;BR IF NO BELL
(1)  006450  105777  172640                  TSTB    @$TPS           ;TTY READY.
(1)  006454  100003                          BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
(1)  006456  112777  000207  172632          MOVB    #207,@$TPB      ;PUSH A BELL AT THE TTY.
(1)  006464  032777  020000  172612  XBX:    BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
(1)  006472  001113                          BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
(1)  006474  021637  001262                  CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
(1)  006500  001404                          BEQ     1$              ;BR IF YES
(1)  006502  011637  001262                  MOV     (SP),$ERRPC     ;RECORD BEING HERE
(1)  006506  105037  001247                  CLRB    $ERFLG          ;PREPARE HEADER
(1)  006512  104407                  1$:     SAV05                   ;SAVE ALL PROC REGISTERS
(1)  006514  011605                          MOV     (SP),R5         ;GET THE PC OF ERROR
(1)  006516  162705  000002                  SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
(1)  006522  011504                          MOV     (R5),R4         ;GET ERROR INSTRUCTION
(1)  006524  110437  001260                  MOVB    R4,$ITEMB       ;COPY TEST NUMBER FOR APT HANDLING
(1)  006530  006304                          ASL     R4              ;MULT BY TWO
(1)  006532  061504                          ADD     (R5),R4         ;DOUBLE IT
(1)  006534  006304                          ASL     R4              ;MULT AGAIN
(1)  006536  042704  177001                  BIC     #177001,R4      ;CLEAR JUNK
(1)  006542  062704  016034                  ADD     #.ERRTAB,R4     ;GET POINTER
(1)  006546  012437  006672                  MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
(1)  006552  012437  006704                  MOV     (R4)+,DATAHD    ;GET DATA HEADRER
(1)  006556  011437  006716                  MOV     (R4),DATABP     ;GET DATA TABLE
(1)  006562  105737  001247                  TSTB    $ERFLG          ;TYPE HEADER
(1)  006566  001403                          BEQ     TYPMSG          ;BR IF YES
(1)  006570  005737  006716                  TST     DATABP          ;DOES DATA TABLE EXIST?
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(1)  006574  001044                  BNE     TYPDAT          ;BR IF YES.
(1)  006576  104402  001357  TYPMSG: TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN
(1)  006602  104402  001357          TYPE    ,$CRLF          ;AND TYPE ANOTHER
(1)  006606  005737  001364          TST     LOCK
(1)  006612  001402                  BEQ     1$
(1)  006614  104402  007775          TYPE    ,MASTEK
(1)  006620  104402  007763  1$:     TYPE    ,MTSTN
(1)  006624  104412  007054          CNVRT   ,XTSTN          ;SHOW IT
(1)  006630  104402  010055          TYPE    ,MERRPC         ;TYPE PC.
(1)  006634  104412  007046          CNVRT   ,ERTABO         ;SHOW IT
(1)  006640  104402  007725          TYPE    ,MCSRX
(1)  006644  104412  004340          CNVRT   ,XCSR
(1)  006650  104402  001357          TYPE    ,$CRLF          ;GIVE A CR/LF
(1)  006654  112737  177777  001247  MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
(1)  006662  005737  006672          TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
(1)  006666  001402                  BEQ     WTBS.FM         ;BR IF NO.
(1)  006670  104402                  TYPE                    ;TYPE
(1)  006672  000000  ERRMSG: 0                               ;    ERROR MESSAGE
(1)  006674          WTBS.FM:                                ;
(1)  006674  005737  006704          TST     DATAHD          ;DATA HEADER?
(1)  006700  001402                  BEQ     TYPDAT          ;BR IF NO
(1)  006702  104402                  TYPE                    ;TYPE
(1)  006704  000000  DATAHD: 0                               ;    DATA HEADER
(1)  006706  005737  006716  TYPDAT: TST     DATABP          ;DATA TABLE?
(1)  006712  001402                  BEQ     RESREG          ;BR IF NO.
(1)  006714  104411                  CONVRT                  ;SHOW
(1)  006716  000000  DATABP: 0                               ;    DATA TABLE
(1)  006720  104410  RESREG: RES05                           ;RESTORE PROC REGISTERS
(1)  006722  122737  000001  001140  HALTS:  CMPB    #APTENV,$ENV    ;IS APT RUNNING?
(1)  006730  001007                  BNE     15$             ;SKIP APT CALL IF NOT
(1)  006732  113737  001260  006744  MOVB    $ITEMB,5$       ;COPY ERROR NUMBER
(1)  006740  004737  005176          JSR     PC,$ATY4        ;CALL APT SERVICE
(1)  006744  000000  5$:     .WORD   0                       ;ERROR NUMBER STUCK HERE
(1)  006746  000777  10$:    BR      10$                     ;LOCK UP HERE
(1)  006750  022737  004324  000042  15$:    CMP     #$ENDAD,@#42    ;CHECK TO SEE IF IN ACT-11 MODE
(1)  006756  001403                  BEQ     20$             ;IF SO, HANDLE ACCORDINGLY
(1)  006760  005777  172320          TST     @SWR            ;HALT ON ERROR?
(1)  006764  100004                  BPL     EXITER          ;BR IF NO HALT ON ERROR
(1)  006766  016677  000002  172312  20$:    MOV     2(SP),@DISPLAY  ;SHOW ERROR PC IN DATA DISPLAY
(1)  006774  000000                  HALT                    ;HALT
(1)  006776  005237  001256  EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
(1)  007002  004737  007062          JSR     PC,SERV.G       ;FIND OUT IF ^G WAS TYPED
(1)  007006  032777  000400  172270  BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
(1)  007014  001007                  BNE     1$              ;BR IF YES
(1)  007016  032777  002000  172260  BIT     #SW10,@SWR      ;GOTO NEXT TEST?
(1)  007024  001407                  BEQ     2$              ;BR IF NO
(1)  007026  013737  001362  001252  MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
(1)  007034  012706  001120  1$:     MOV     #STACK,SP       ;RESET SP
(1)  007040  000177  172206          JMP     @$LPADR         ;GOTO SPECIFIED TEST
(1)  007044  000002  2$:     RTI                             ;RETURN
(1)  007046  000001  ERTABO: 1
(1)  007050     006     002          .BYTE   6,2
(1)  007052  001404                  SAVPC
(1)  007054  000001  XTSTN:  1
(1)  007056     002     002          .BYTE   2,2
(1)  007060  001246                  $TSTNM
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(1)  007062  017746  172224          SERV.G: MOV     @$TKB,-(SP)     ;OTHERWISE, GET THE LAST CHARACTER TYPED
(1)  007066  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY(EIGHTH) BIT
(1)  007072  122726  000007                  CMPB    #7,(SP)+        ;IS IT ^G?
(1)  007076  001076                          BNE     6$              ;IF NOT, IGNORE INPUT
(1)  007100  032777  004000  172202          BIT     #4000,@$TKS     ;RX BUSY?
(1)  007106  001365                          BNE     SERV.G          ;BR IF YES
(1)          007110                  GETSWR= .                                               ;;GPA
(1)  007110  017737  172170  007316          MOV     @SWR,90$        ;SAVE (SWR).
(1)  007116  104402  007276          1$:     TYPE    ,89$            ;TYPE HEADER FOR OLD SWITCH REGISTER
(1)  007122  104412  007310                  CNVRT   ,88$            ;TYPE THE NUMBER ITSELF
(1)  007126  104402  007320                  TYPE    ,91$            ;AFTER HAVING CONVERTED IT TO ASCII
(1)  007132  105037  007324                  CLRB    92$             ;CLEAR SWR CHANGE FLAG
(1)  007136  005077  172142                  CLR     @SWR            ;CLEAR THE SOFTWARE SWITCH REGISTER
(1)  007142  105777  172142          3$:     TSTB    @$TKS           ;WAIT FOR DONE.
(1)  007146  100375                          BPL     3$              ;CONTINUE WAITING FOR IT
(1)  007150  017746  172136                  MOV     @$TKB,-(SP)     ;PUT THE CHARACTER ON THE STACK
(1)  007154  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY BIT
(1)  007160  122726  000015                  CMPB    #15,(SP)+       ;IS IT THE CARRIAGE RETURN CHAR?
(1)  007164  001433                          BEQ     4$              ;IF SO, GO PRINT CRLF
(1)  007166  105777  172122          2$:     TSTB    @$TPS           ;IS THE OUTPUT BUFFER AVAILABLE
(1)  007172  100375                          BPL     2$              ;IF NOT, WAIT FOR IT TO BE READY
(1)  007174  105237  007324                  INCB    92$             ;INDICATE THAT THE SWR WAS CHANGED
(1)  007200  014677  172112                  MOV     -(SP),@$TPB     ;PLACE THE CHARACTER THERE(ECHO BACK)
(1)  007204  000241                          CLC                     ;GET READY TO ROTATE
(1)  007206  006177  172072                  ROL     @SWR            ;MOVE THE EXISTING BITS OVER
(1)  007212  006177  172066                  ROL     @SWR            ;TO MAKE ROOM FOR THE INCOMING
(1)  007216  006177  172062                  ROL     @SWR            ;THREE BITS FROM THIS CHARACTER
(1)  007222  103735                          BCS     1$              ;ERROR
(1)  007224  022627  000060                  CMP     (SP)+,#60       ;IS IT LOWER THAN 0?
(1)  007230  002732                          BLT     1$              ;IF SO, GO ASK AGAIN
(1)  007232  026627  177776  000067          CMP     -2(SP),#67      ;IS IT HIGHER THAN 7?
(1)  007240  003326                          BGT     1$              ;IF SO, GO ASK AGAIN
(1)  007242  042746  177770                  BIC     #^C<7>,-(SP)    ;ISOLATE INFORMATION BITS
(1)  007246  052677  172032                  BIS     (SP)+,@SWR      ;ADD THEM TO THE SWITCH REGISTER
(1)  007252  000733                          BR      3$              ;GO CHECK FOR THE NEXT CHARACTER
(1)  007254  105737  007324          4$:     TSTB    92$             ;HAS THE SWR BEEN CHANGED?
(1)  007260  001003                          BNE     5$              ;IF YES GO TYPE CRLF
(1)  007262  013777  007316  172014          MOV     90$,@SWR        ;IF NOT RESTORE SWR
(1)  007270  104402  001357          5$:     TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN AND LINE FEED
(1)  007274  000207                  6$:     RTS     PC              ;RETURN TO CALLING PROCEDURE
(1)
(1)  007276  020200  051450  051127  89$:     .ASCIZ  <200>? (SWR)=/?
(1)  007304  036451  000057
(1)                                  .EVEN
(1)  007310  000001                  88$:     1
(1)  007312     006     000                  .BYTE   6,0
(1)  007314  007316                          90$
(1)  007316  000000                  90$:     .WORD   0
(1)  007320  036457  000057          91$:     .ASCIZ  ?/=/?
(1)  007324     000                  92$:     .BYTE   0
(1)          007326                  .EVEN
(2)                                  .SBTTL  POWER DOWN AND UP ROUTINES
(2)
(3)                                  ;;******************************************************************
(2)                                  ;POWER DOWN ROUTINE
(2)  007326  012737  007472  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
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(2)  007334  012737  000300  000026          MOV     #PR6,@#PWRVEC+2 ;;PRIO:6
(4)  007342  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  007344  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(4)  007346  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(4)  007350  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(4)  007352  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
(4)  007354  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(4)  007356  017746  171722                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
(2)  007362  010637  007476                  MOV     SP,$SAVR6       ;;SAVE SP
(2)  007366  012737  007400  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
(2)  007374  000000                          HALT
(2)  007376  000776                          BR      .-2             ;;HANG UP
(2)
(3)                                  ;;*************************************************************************
(2)                                  ;POWER UP ROUTINE
(2)  007400  012737  007472  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
(2)  007406  013706  007476                  MOV     $SAVR6,SP       ;;GET SP
(2)  007412  005037  007476                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
(2)  007416  005237  007476          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
(2)  007422  001375                          BNE     1$              ;;OF  WORD
(4)  007424  012677  171654                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
(4)  007430  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
(4)  007432  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
(4)  007434  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
(4)  007436  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
(4)  007440  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(4)  007442  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(2)  007444  012737  007326  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
(2)  007452  012737  000300  000026          MOV     #PR6,@#PWRVEC+2 ;;PRIO:6
(2)  007460  104402                          TYPE                    ;;REPORT THE POWER FAILURE
(2)  007462  007500                  $PWRMG: .WORD   MPFAIL          ;;POWER FAIL MESSAGE POINTER
(2)  007464  012716                          MOV     (PC)+,(SP)      ;;RESTART AT RESTART
(2)  007466  011024                  $PWRAD: .WORD   RESTART         ;;RESTART ADDRESS
(2)  007470  000002                          RTI
(2)  007472  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
(2)  007474  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
(2)  007476  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
(2)  007500  050200  051127  043040  MPFAIL: .ASCIZ   <200>/PWR FAILED. RESTART AT LAST TEST /
(2)  007543     200  047105  020104  MEPASS: .ASCIZ   <200>/END PASS CNDZA-A  /
(2)  007567     200  052522  047116  MR:     .ASCIZ   <200>/RUNNING   /
(2)  007603     200  051120  043517  MERR2:  .ASCIZ   <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2)  007652  044600  051516  043125  MERR3:  .ASCIZ   <200>/INSUFFICIENT DATA!/
(2)  007676  046200  041517  020113  MLOCK:  .ASCIZ   <200>/LOCK ON SELECTED TEST/
(2)  007725     103  051123  020072  MCSRX:  .ASCIZ    /CSR: /
(2)  007733     126  041505  020072  MVECX:  .ASCIZ   /VEC: /
(2)  007741     120  051501  042523  MPASSX: .ASCIZ   /PASSES: /
(2)  007752  051105  047522  051522  MERRX:  .ASCIZ   /ERRORS: /
(2)  007763     124  051505  020124  MTSTN:  .ASCIZ   /TEST NO: /
(2)  007775     052  000040          MASTEK: .ASCIZ   /* /
(2)  010000  052200  050131  020105  MNEW:   .ASCIZ   <200>/TYPE A BIT MAP OF DZV11'S DESIRED ACTIVE:  /
(2)  010055     120  035103  000040  MERRPC: .ASCIZ   /PC: /
(2)  010062  046600  050101  047440  XHEAD:  .ASCIZ   <200>/MAP OF DZV11 STATUS/<200>
(2)  010110  044600  046114  043505  MBADLN: .ASCIZ   <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2)                                  .EVEN
(2)  010152  000002                  XSTATQ: 2
(2)  010154     006     003                  .BYTE   6,3
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(2)  010156  001344                          $TMP1
(2)  010160     005     002                  .BYTE   6,2
(2)  010162  001346                          $TMP2
(1)                                .EVEN
(2)                                ;THIS ROUTINE ESTABLISHES WHICH MAINTENANCE MODE THE DEVICE IS IN
(2)                                ;-------------------------------------------------------------
(2)                                ;E=EXTERNAL LOOP BACK
(2)                                ;I=INTERNAL LOOP BACK
(2)                                ;S=STAGGERED LOOP BACK
(2)  010164  017605  000000        .SETFLG:MOV     @(SP),R5        ;PICK UP ADDRESS OF TAG
(2)  010170  042737  000040  010360        BIC     #40,INBUF       ;STRIP LOWER CASE
(2)  010176  122737  000105  010360        CMPB    #'E,INBUF       ;IS IT EXTERNAL LOOP BACK ?
(2)  010204  001005                        BNE     4$              ;NO
(2)  010206  013715  010276                MOV     1$,(R5)         ;YES STORE INFO
(2)  010212  105037  001424                CLRB    MNTFLG          ;SET MAINT BIT =0
(2)  010216  000422                        BR      7$              ;GET OUT
(2)  010220  122737  000111  010360  4$:   CMPB    #'I,INBUF       ;IS IT INTERNAL LOOP BACK ?
(2)  010226  001006                        BNE     5$              ;NO
(2)  010230  013715  010300                MOV     2$,(R5)         ;YES STORE INFO
(2)  010234  112737  000010  001424        MOVB    #MAINT,MNTFLG   ;SET UP THE MAINTENANCE FLAG LOADER
(2)  010242  000410                        BR      7$              ;GET OUT
(2)  010244  122737  000123  010360  5$:   CMPB    #'S,INBUF       ;IS IT STAGGERED LOOP BACK ?
(2)  010252  001007                        BNE     6$              ;WHAT ?
(2)  010254  013715  010302                MOV     3$,(R5)         ;YES STORE INFO
(2)  010260  105037  001424                CLRB    MNTFLG          ;ZERO BITS
(2)  010264  062716  000002        7$:     ADD     #2,(SP)         ;POP AROUND
(2)  010270  000002                        RTI
(2)  010272  104404                6$:     INSTER                  ;RETRY
(2)  010274  000733                        BR      .SETFLG         ;DITTO
(2)  010276  000200                1$:     .WORD   200             ;EXTERNAL =  E
(2)  010300  000000                2$:     .WORD   0               ;INTERNAL = I
(2)  010302  100000                3$:     .WORD   100000          ;STAGGERED = S
(2)
```

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(2)                                     ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
(2)                                     ;BUFFER TO THE CHARACTERS "E" AND "C".
(2)                                     ;IF THE CHARACTER IS "E" CLEAR THE FLAG
(2)                                     ;IF THE CHARACTER IS "C" SET THE FLAG
(2)
(2)  010304  017605  000000        .PAWCH:MOV     @(SP),R5
(2)  010310  142737  000040  010360        BICB    #40,INBUF       ;SET FOR LOWER CASE INPUT
(2)  010316  122737  000105  010360        CMPB    #'E,INBUF       ;IS IT "E" ?
(2)  010324  001002                        BNE     1$
(2)  010326  105015                        CLRB    (R5)            ;000
(2)  010330  000406                        BR      2$
(2)  010332  122737  000103  010360  1$:    CMPB    #'C,INBUF       ;IS IT "C" ?
(2)  010340  001005                        BNE     3$
(2)  010342  112715  177777                MOVB    #-1,(R5)        ;3177
(2)  010346  062716  000002          2$:   ADD     #2,(SP)
(2)  010352  000002                        RTI
(2)  010354  104404                  3$:   INSTER                  ;RETRY
(2)  010356  000752                        BR      .PAWCH
(2)
(2)                                     ;BUFFERS FOR INPUT-OUTPUT
(2)
(2)  010360  000000                  INBUF:  0
(2)          010422                        .=.+40
(2)                                  ; TEMP: 0       ; TEMP AREA UNUSED.                          ;;GPA
(2)                                  ; .=.+40        ; DELETED TO CONSERVE SPACE                  ;;GPA
(2)  010422  000000                  MDATA:  0
(2)          010464                        .=.+40
(2)
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(2)
(2)                                             ;
(2)                                             ;ROUTINE USED TO "CYCLE" THROUGH UP TO SIXTEEN DZV11'S
(2)                                             ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
(2)                                             ;AND RUNS THE SPECIFIED DZV11'S.  THIS ROUTINE *MUST*
(2)                                             ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
(2)                                             ;SETUP NECESSARY.
(2)                                             ;
(2)
(2)  010464  005737  001406          CYCLE:  TST     DZVACTV         ;ARE ANY DZV11'S TO BE TESTED?
(2)  010470  001004                          BNE     1$              ;BR IF OK.
(2)  010472  104402  007603                  TYPE    ,MERR2          ;NO DZV11'S SELECTED!!
(2)  010476  000000                          HALT                    ;STOP THE SHOW.
(2)  010500  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
(2)  010502  013737  004632  001354  1$:     MOV     $MXCNT,$TIMES   ;RESTORE THE NUMBER OF ITERATIONS TO MAKE
(2)  010510  033737  001412  001406          BIT     RUN,DZVACTV     ;IS THIS ONE "ACTIVE"
(2)  010516  001017                          BNE     2$              ;BR IF GOOD ONE FOUND.
(2)  010520  006137  001412                  ROL     RUN             ;UPDATE POINTER
(2)  010524  005537  001412                  ADC     RUN             ;CATCH CARRY FROM RUN
(2)  010530  062737  000012  001420          ADD     #12,ACTIVE      ;UPDATE ADDRESS POINTER.
(2)  010536  022737  001740  001420          CMP     #DZV.END,ACTIVE ;HAVE WE PASSED THE END OF THE MAP?
(2)  010544  001356                          BNE     1$              ;IF NO, KEEP GOING; NOT ALL TESTED FOR.
(2)  010546  012737  001500  001420          MOV     #DZV.MAP,ACTIVE ;RESET ADDRESS POINTER.
(2)  010554  000752                          BR      1$              ;KEEP LOOKING FOR ACTIVE DZV11
(2)  010556  006137  001412          2$:     ROL     RUN             ;UPDATE POINTER.
(2)  010562  005537  001412                  ADC     RUN             ;CATCH CARRY.
(2)  010566  013700  001420                  MOV     ACTIVE,R0       ;GET ADDRESS POINTER.
(2)  010572  062737  000012  001420          ADD     #12,ACTIVE      ;UPDATE.
(2)  010600  022737  001740  001420          CMP     #DZV.END,ACTIVE
(2)                                                                  ;ALL DONE?
(2)  010606  001003                          BNE     3$              ;BR IF NO.
(2)  010610  012737  001500  001420          MOV     #DZV.MAP,ACTIVE ;RESTORE POINTER.
(2)  010616  012037  001174          3$:     MOV     (R0)+,$BASE     ;LOAD SYSTEM CTRL. REG
(2)  010622  012037  002040                  MOV     (R0)+,DZVRIV    ;LOAD VECTOR
(2)  010626  012037  001366                  MOV     (R0)+,LINE      ;SET UP DZV LINES ACTIVE
(2)  010632  012037  001370                  MOV     (R0)+,PAR       ;SET UP PARAMETERIZATION
(2)  010636  012037  001372                  MOV     (R0)+,MODE      ;SET UP MAINTENANCE MODE
(2)  010642  105037  001424                  CLRB    MNTFLG  ;RESET MAINT. FLAG IF
(2)  010646  005737  001372                  TST     MODE            ;RUNNING TESTS
(2)  010652  001003                          BNE     9$              ;IN
(2)  010654  112737  000010  001424          MOVB    #MAINT,MNTFLG   ;INTERNAL MAINT. MODE
(2)  010662  004737  011030          9$:     JSR     PC,DZVLEV       ;SET UP
(2)  010666  005737  000042                  TST     @#42            ;ARE WE UNDER MONITOR CONTROL?
(2)  010672  001051                          BNE     7$              ;IF YES, SKIP THIS SETUP
(2)  010674  032777  000002  170402          BIT     #SW01,@SWR      ;IF SW01=1, GET STARTING TEST #
(2)  010702  001445                          BEQ     7$              ;BR IF NO TEST IS TO BE INPUTTED
(2)  010704  104402  001357          4$:     TYPE    ,$CRLF
(3)  010710  104403                          INSTR                   ;CALL THE STRING INPUT ROUTINE
(3)  010712  007763                          MTSTN                   ;POINTER TO MESSAGE TO BE PRINTED
(3)  010714  104405                          PARAM                   ;CALL THE OCTAL TO ASCII CONVERT ROUTINE
(3)  010716  000001                          1                       ;LOWEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(3)  010720  001000                          1000                    ;HIGHEST LEGITIMATE VALUE OF EXPECTED RESPONSE
(3)  010722  001246                          $TSTNM                  ;POINTER TO MAP LOCATION TO BE FILLED
(3)  010724     000                          .BYTE   0               ;MASK OF INVALID BITS FOR THIS PARAMETER
(3)  010725     001                          .BYTE   1               ;NUMBER OF PARAMETERS TO STORE
(2)  010726  012700  012024                  MOV     #TST1,R0
```

```
(2)  010732  022710  000004          5$:     CMP     #4,(R0)
(2)  010736  001020                          BNE     6$
(2)  010740  022760  012737  000002          CMP     #12737,2(R0)
(2)  010746  001014                          BNE     6$
(2)  010750  023760  001246  000004          CMP     $TSTNM,4(R0)    ;IS THIS THE TEST ?
(2)  010756  001010                          BNE     6$              ;IF NOT, DON'T PROCESS NUMBER
(2)  010760  010037  001252                  MOV     R0,$LPADR       ;SAVE PC
(2)  010764  062737  000002  001252          ADD     #2,$LPADR       ;POP OVER PREVIOUS SCOPE
(2)  010772  104402  001357                  TYPE    ,$CRLF
(2)  010776  000412                          BR      8$
(2)  011000  005720                  6$:     TST     (R0)+
(2)  011002  020027  015502                  CMP     R0,#TLAST+10
(2)  011006  001351                          BNE     5$
(2)  011010  104402  001356                  TYPE    ,$QUES
(2)  011014  000733                          BR      4$
(2)  011016  012737  012024  001252  7$:     MOV     #TST1,$LPADR    ;PREPARE TEST ADDRESS
(2)  011024                          8$:
(2)  011024  000177  170222          RESTART:JMP     @$LPADR         ;GO START TESTING.***WARNING!****
(2)                                                                  ;THIS JUMP IS USED BY POWER UP ROUTINE!!!!
(2)
(2)                                  ;THIS UTILITY SETS UP CSR'S,SETS UP VECTORS.
(2)  011030  013700  002040          DZVLEV: MOV     DZVRIV,R0       ;PLACE THE BASE VECTOR ADDRESS IN R0
(2)  011034  062700  000002                  ADD     #2,R0           ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
(2)  011040  010037  002042                  MOV     R0,DZVRIS       ;STORE IT HERE
(2)  011044  062700  000002                  ADD     #2,R0           ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
(2)  011050  010037  002044                  MOV     R0,DZVTIV       ;STORE IT HERE
(2)  011054  062700  000002                  ADD     #2,R0           ;CALCULATE THE TRANSMITTER VECTOR STATUS ADDRESS
(2)  011060  010037  002046                  MOV     R0,DZVTIS       ;STORE IT HERE
(2)
(2)                                  ;THIS SEGMENT SETS UP POINTERS FOR THE GIVEN DZV11. $BASE IS THE BASE ADDRESS
(2)                                  ;OF THE DEVICE
(2)  011064  013700  001174                  MOV     $BASE,R0        ;COPY THE ADDRESS BEING LOADED
(2)  011070  010037  002010                  MOV     R0,DZVCSR       ;XXX0
(2)  011074  005200                          INC     R0
(2)  011076  010037  002012                  MOV     R0,HDZVCSR      ;XXX1
(2)  011102  005200                          INC     R0
(2)  011104  010037  002014                  MOV     R0,DZVRBUF      ;XXX2
(2)  011110  010037  002020                  MOV     R0,DZVLPR       ;XXX2
(2)  011114  005200                          INC     R0
(2)  011116  010037  002016                  MOV     R0,HDZVRBUF     ;XXX3
(2)  011122  010037  002022                  MOV     R0,HDZVLPR      ;XXX3
(2)  011126  005200                          INC     R0
(2)  011130  010037  002024                  MOV     R0,DZVTCR       ;XXX4
(2)  011134  005200                          INC     R0
(2)  011136  010037  002026                  MOV     R0,HDZVTCR      ;XXX5
(2)  011142  005200                          INC     R0
(2)  011144  010037  002030                  MOV     R0,DZVMSR       ;XXX6
(2)  011150  010037  002034                  MOV     R0,DZVTDR       ;XXX6
(2)  011154  005200                          INC     R0
(2)  011156  010037  002032                  MOV     R0,HDZVMSR      ;XXX7
(2)  011162  010037  002036                  MOV     R0,HDZVTDR      ;XXX7
(2)  011166  000207                          RTS     PC
```

```
(2)                                     ;CONVERT DECIMAL ASCII STRING TO OCTAL
(2)  011170  000002                .PARMD: RTI             ; DECIMAL PARAMETERS UNUSED.          ;;GPA
(2)                                .REM &                  ; DELETED TO CONSERVE SPACE...        ;;GPA
(2)                                                        ;...AND REMAIN UNDER 4KW SIZE.        ;;GPA
(2)                                .PARMD: MOV     (SP),R5
(2)                                        MOV     (R5)+,6$
(2)                                        MOV     (R5)+,7$
(2)                                        MOV     (R5)+,8$
(2)                                        MOVB    (R5)+,9$
(2)                                        MOVB    (R5)+,10$
(2)                                        MOV     R5,(SP)
(2)                                2$:     CLR     R5
(2)                                        MOV     #INBUF,R4
(2)                                        CMPB    #15,(R4)
(2)                                        BEQ     3$
(2)                                1$:     CMPB    (R4),#'0
(2)                                        BLT     3$
(2)                                        CMPB    (R4),#'9
(2)                                        BGT     3$
(2)                                        BICB    #'0,(R4)
(2)                                        CLR     R2
(2)                                        BISB    (R4)+,R2
(2)                                        ADD     R2,R5
(2)                                        CMPB    #15,(R4)
(2)                                        BEQ     4$
(2)                                        ASL     R5      ;X2
(2)                                        MOV     R5,R2   ;SAVE X2
(2)                                        ASL     R5      ;X4
(2)                                        ASL     R5      ;X8
(2)                                        ADD     R2,R5   ;TIMES 10
(2)                                        BR      1$
(2)                                3$:     INSTER
(2)                                        BR      2$
(2)
(2)                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(2)
(2)                                4$:     CMP     R5,7$
(2)                                        BHI     3$
(2)                                        CMP     R5,6$
(2)                                        BLO     3$
(2)                                        BITB    9$,R5
(2)                                        BNE     3$
(2)
(2)                                        ;STORE NUMBER AT SPECIFIED ADDRESS
(2)
(2)                                        MOV     8$,R4
(2)                                5$:     MOV     R5,(R4)+
(2)                                        ADD     #2,R5
(2)                                        DECB    10$
(2)                                        BNE     5$
(2)                                        RTI
(2)                                6$:     0
(2)                                7$:     0
(2)                                8$:     0
(2)                                9$:     .BYTE 0
(2)                                10$:    .BYTE 0
```

```
   (2)                              ; END OF .PARMD DELETE RANGE          &                    ;;GPA
```

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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)  011172  012700  001500        SETAPT: MOV     #DZV.MAP,R0      ;POINT TO THE DEVICE MAP TABLE
(2)  011176  013701  001174                MOV     $BASE,R1         ;BUILD DEVICE ADDRESSES IN R1
(2)  011202  013702  001170                MOV     $VECT1,R2        ;BUILD DEVICE VECTORS IN R2
(2)  011206  042702  177007                BIC     #^C<770>,R2      ;STRIP AWAY OTHER INFORMATION
(2)
(2)  011212  012704  001204                MOV     #$DDW0,R4        ;POINT TO THE BEGINNING OF DEVICE PARAMETERS
(2)  011216  013705  001176                MOV     $DEVM,R5         ;GET THE MAP OF ACTIVE DEVICES
(2)  011222  105037  001414                CLRB    DZVNUM           ;INITIALIZE NO. OF DEVICES IN SYSTEM
(2)  011226  005037  001410                CLR     SAVACTV          ;CLEAR THE ACTIVE BIT MAP
(2)  011232  006005                1$:     ROR     R5               ;GET A DEVICE SELECTION BIT
(2)  011234  103407                        BCS     3$               ;IF IT IS SELECTED, GO SET UP A MAP
(2)  011236  001422                        BEQ     5$               ;IF NO MORE ARE SELECTED, GET OUT OF SETUP
(2)  011240  005724                        TST     (R4)+            ;POINT TO NEXT DEVICE DESCRIPTOR
(2)  011242  062701  000010        2$:     ADD     #10,R1           ;SET UP THE NEXT ADDRESS
(2)  011246  062702  000010                ADD     #10,R2           ;SET UP THE NEXT VECTOR GROUP
(2)  011252  000767                        BR      1$               ;GO SEE IF MORE DEVICES REMAIN
(2)  011254  006137  001410        3$:     ROL     SAVACTV          ;SET BIT IN ACTIVE DEVICE MAP
(2)  011260  105237  001414                INCB    DZVNUM           ;INCREMENT NO. OF ACTIVE DEVICES IN SYSTEM
(2)  011264  010120                        MOV     R1,(R0)+         ;LOAD DEVICE ADDRESS
(2)  011266  010220                        MOV     R2,(R0)+         ;LOAD THE VECTOR ADDRESS
(2)  011270  013720  001200                MOV     $CDW1,(R0)+      ;GET THE NUMBER OF LINES IN OPERATION
(2)  011274  012420                        MOV     (R4)+,(R0)+      ;LOAD DEVICE PARAMETERS
(2)  011276  013720  001202                MOV     $CDW2,(R0)+      ;LOAD DEFAULT TESTING MODE
(2)  011302  000757                        BR      2$               ;GO BUILD THE NEXT ADDRESS
(2)  011304  012710  177777        5$:     MOV     #-1,(R0)         ;TERMINATE THE DEVICE MAP
(2)  011310  012737  001142  001304        MOV     #$SWREG,SWR      ;SET TO SOFTWARE APT SWITCH REGISTER
(2)  011316  000207                        RTS     PC               ;RETURN TO PRINT STATUS TABLE
(2)
(2)
(2)                                         ;*ROUTINE USED TO "AUTO SIZE" THE DZV11
(2)                                         ;*CSR AND VECTOR.
(2)                                         ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
(2)                                         ;*      ADDRESS RANGE (160000:163770)
(2)                                         ;*      AND THE VECTOR MAY BE ANY WHERE IN THE
(2)                                         ;*      FLOATING VECTOR RANGE (300:770)
(2)                                         ;*
(2)
(2)  011320                        AUTO.SIZE:
(2)  011320  000005                        RESET                    ;INSURE A BUS INIT.
(2)  011322  105337  001422                DECB    INIFLG           ;SHOW THAT I WAS HERE
(2)  011326  012702  001500        CSRMAP: MOV     #DZV.MAP,R2      ;LOAD MAP POINTER.
(2)  011332  012703  001204                MOV     #$DDW0,R3        ;POINT TO ETABLE DEVICE DESCRIPTOR WORDS
(2)  011336  005022                1$:     CLR     (R2)+            ;ZERO ENTIRE MAP
(2)  011340  022702  001740                CMP     #DZV.END,R2      ;ALL DONE?
(2)  011344  001374                        BNE     1$               ;BR IF NO
(2)  011346  105037  001414                CLRB    DZVNUM           ;SET OCTAL NUMBER OF DZV11'S TO 0
(2)  011352  012702  001500                MOV     #DZV.MAP,R2
(2)  011356  012701  160000                MOV     #160000,R1       ;SET FOR FIRST ADDRESS TO BE TESTED
(2)  011362  012737  011626  000004        MOV     #6$,@#4          ;SET FOR NON-EXISTENT DEVICE TIME OUT
(2)  011370  052711  000040        2$:     BIS     #BIT5,(R1)       ;TRY TO SET MASTER SCAN ENABLE
(2)  011374  052761  000017  000004        BIS     #17,4(R1)        ;TRY TO TRANSMIT ON ANY LINE
(2)  011402  005000                        CLR     R0               ;USE R0 AS A COUNTER
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(2)  011404  005711                  7$:     TST     (R1)            ;HAS TRANSMITTER READY COME UP?
(2)  011406  100403                          BMI     8$              ;IF SO, GO GET A FINAL CHECK
(2)  011410  005300                          DEC     R0              ;REDUCE COUNT. TIME UP?
(2)  011412  001374                          BNE     7$              ;IF NOT, KEEP WAITING
(2)  011414  000437                          BR      3$              ;ASSUME IT'S NOT A DZV11
(2)  011416  032761  000017  000004  8$:     BIT     #17,4(R1)       ;ARE ANY TCR BITS  STILL SET? THEY SHOULD BE
(2)  011424  001433                          BEQ     3$              ;IF IT'S NOT, ASSUME IT'S NOT A DZV11
(2)  011426  032711  000040                  BIT     #BIT5,(R1)      ;IS MASTER SCAN ENABLE STILL SET?
(2)  011432  001430                          BEQ     3$              ;IF NOT, ASSUME IT'S NOT A DZV11
(2)  011434  052711  000020                  BIS     #20,(R1)        ;SET DEVICE CLEAR
(2)  011440  000240                          NOP
(2)  011442  032711  000040                  BIT     #40,(R1)        ;DID SCANNER CLEAR
(2)  011446  001022                          BNE     3$              ;IF NOT ASSUME IT IS NOT DZV
(2)  011450  005061  000004                  CLR     4(R1)           ;GET RID OF TCR BITS
(2)                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DZV11 CSR ADDRESS.
(2)  011454  010122                          MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
(2)  011456  005722                          TST     (R2)+           ;POP OVER VECTOR STORE AREA
(2)  011460  012722  000017                  MOV     #17,(R2)+       ;SET THE DEFAULT LINE SELECTION PARAMETER
(2)  011464  012712  017470                  MOV     #17470,(R2)     ;SET THE DEFAULT PARAMETERS
(2)  011470  012223                          MOV     (R2)+,(R3)+     ;COPY PARAMETERS INTO ETABLE DESCRIPTOR
(2)  011472  005022                          CLR     (R2)+           ;SET THE DEFAULT MODE OF OPERATION
(2)  011474  012712  177777                  MOV     #-1,(R2)        ;TERMINATE LIST
(2)  011500  105237  001414                  INCB    DZVNUM          ;UPDATE DEVICE COUNTER
(2)  011504  122737  000020  001414          CMPB    #20,DZVNUM      ;ARE MAX. NO. OF DEV FOUND?
(2)  011512  001405                          BEQ     100$            ;YES DON'T LOOK FOR ANY MORE.
(2)  011514  062701  000010          3$:     ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
(2)  011520  022701  164000                  CMP     #164000,R1
(2)  011524  001321                          BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
(2)  011526                          100$:
(2)  011526  105737  001414                  TSTB    DZVNUM          ;WERE ANY DZV11'S FOUND AT ALL?
(2)  011532  001430                          BEQ     5$              ;ERROR AUTO SIZER FOUND NO DZV11'S IN THIS SYS.
(2)  011534  113701  001414                  MOVB    DZVNUM,R1
(2)  011540  012737  000001  001410          MOV     #1,SAVACTV      ;CREATE A BIT MAP OF THE ACTIVE
(2)  011546  005301                  4$:     DEC     R1              ;DEVICES IN THE SYSTEM
(2)  011550  001404                          BEQ     98$
(2)  011552  000261                          SEC
(2)  011554  006137  001410                  ROL     SAVACTV
(2)  011560  000772                          BR      4$
(2)  011562  013737  001500  001174  98$:     MOV     DZCR0,$BASE     ;POINT TO THE ADDRESS OF FIRST DEVICE
(2)  011570  013737  001510  001202          MOV     MANT0,$CDW2     ;INDICATE TO ETABLE WHAT MODE IS BEING USED
(2)  011576  012737  000006  000004  99$:     MOV     #6,@#4          ;RESTORE TRAP VECTOR
(2)  011604  013737  001410  001176          MOV     SAVACTV,$DEVM   ;SAVE ACTIVE REGISTER
(2)  011612  000410                          BR      VECMAP          ;GO FIND THE VECTOR NOW.
(2)  011614  104402  007603          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DZV11'S FOUND.
(2)  011620  005000                          CLR     R0              ;MAKE DATA DISPLAY ZERO
(2)  011622  000000                          HALT                    ;STOP THE SHOW
(2)  011624  000776                          BR      .-2             ;DISABLE CONT. SW.
(2)  011626  012716  011514          6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTENT TIME-OUT
(2)  011632  000002                          RTI                     ;RETURN TO MAINSTREAM
(2)
(2)  011634  012737  000200  000022  VECMAP: MOV     #MASK,@#22      ;SET IOT TRAP PRIORITY
(2)  011642  012737  011756  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
(2)  011650  012702  001500                  MOV     #DZV.MAP,R2     ;SET SOFTWARE POINTER
(2)  011654  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
(2)  011660  012701  000302                  MOV     #302,R1         ;PC OF IOT INSTR.
(2)  011664  010120                  1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
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(2)  011666  012721  000004              MOV     #4,(R1)+        ;WITH .+2; IOT
(2)  011672  022021                      CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
(2)  011674  020127  001000              CMP     R1,#1000        ;HAS THE VECTOR AREA BEEN EXCEEDED?
(2)  011700  101771                      BLOS    1$              ;BR IF MORE TO FILL
(2)  011702  013704  001410              MOV     SAVACTV,R4      ;STORE TEMPORARILY
(2)  011706  006004              2$:     ROR     R4              ;BRING OUT A BIT
(2)  011710  103036                      BCC     5$              ;BR IF ALL DONE
(2)  011712  106427  000000              MTPS    #0              ;ZERO CPU PRIO
(2)  011716  012772  040040  000000      MOV     #BIT14+BIT5,@(R2)       ;SET TIE AND MAS SCAN
(2)  011724  011201                      MOV     (R2),R1         ;GET CSR
(2)  011726  112761  000017  000004      MOVB    #17,4(R1)       ;SET THE TCR BITS FOR ALL LINES
(2)                                                              ;ATTEMPT TO FORCE AN INTERRUPT
(2)  011734  005200                      INC     R0              ;STALL
(2)  011736  001376                      BNE     .-2             ;       FOR TIME TO INTERRUPT
(2)  011740  012762  000300  000002      MOV     #300,2(R2)      ;NO INTERRUPT ASSUME 300 AND FIX DZV11 LATER
(2)  011746  000005                      RESET                   ;INIT
(2)  011750  062702  000012              ADD     #12,R2          ;POP SOFTWARE POINTER
(2)  011754  000754                      BR      2$              ;KEEP GOING
(2)  011756  011662  000002      4$:     MOV     (SP),2(R2)      ;GET VECTOR ADDRESS
(2)  011762  162762  000010  000002      SUB     #10,2(R2)       ;POINT BACK TO THE CORRECT VECTOR
(2)  011770  042762  000007  000002      BIC     #7,2(R2)        ;CLEAR JUNK
(2)  011776  022626                      POP2SP                  ;POP IOT JUNK OFF STACK
(2)  012000  012716  011750              MOV     #3$,(SP)        ;SET FOR RETURN
(2)  012004  000002                      RTI
(2)  012006  013737  001502  001170  5$: MOV     DZVC0,$VECT1    ;COPY VECTOR OF FIRST DEVICE INTO ETABLE
(2)  012014  012737  004370  000020      MOV     #.SCOPE,IOTVEC  ;RESTORE THE SCOPE TRAP
(2)  012022  000207                      RTS     PC              ;ALL DONE WITH "AUTO SIZING"
(2)
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```
 8709
 8710                                    ;************************* TEST 1 *********************************
  (1)                                    ;*THIS TEST PROVES THE BUS REPLY RESPONSE
  (1)                                    ;*DURING A READ OR WRITE TO THE FOLLOWING ADDRESS:
  (1)                                    ;*      DZVCSR, DZVRBUF, DZVTCR, DZVMSR
  (3)                              ;:*  TEST 1
  (6)                              ;;*************************************************************************
  (5)  012024  000004              TST1:  SCOPE
  (5)
  (3)  012026  012737  000001  001246     MOV    #1,$TSTNM        ;LOAD THE NUMBER OF THIS TEST
  (3)  012034  012737  012214  001362     MOV    #TST2,NEXT       ;POINT TO THE START OF THE NEXT TEST
  (1)  012042  012737  012202  000004     MOV    #5$,4            ;SET TRAP VECTOR
  (1)  012050  012737  000200  000006     MOV    #MASK,6          ;SET PRIORITY TO HIGH(MASK INTERRUPTS)
  (1)  012056  012737  012064  001364     MOV    #1$,LOCK         ;SET RETURN IF SW09=11
  (1)  012064  013700  002010        1$:  MOV    DZVCSR,R0        ;SET ADDRESS TO TEST
  (1)  012070  011001                     MOV    (R0),R1          ;READ THE ADDRESS
  (1)  012072  000240                     NOP                     ;WASTE TIME
  (1)  012074  005010                     CLR    (R0)             ;WRITE THE ADDRESS
  (1)  012076  000240                     NOP                     ;WASTE TIME
  (1)  012100  012737  012106  001364     MOV    #2$,LOCK         ;SET RETURN ADDRESS FOR SW09
  (1)  012106  013700  002014        2$:  MOV    DZVRBUF,R0       ;SET ADDRESS TO TEST
  (1)  012112  011001                     MOV    (R0),R1          ;READ THE ADDRESS
  (1)  012114  000240                     NOP                     ;
  (1)  012116  005010                     CLR    (R0)             ;WRITE THE ADDRESS
  (1)  012120  000240                     NOP                     ;WASTE TIME
  (1)  012122  012737  012130  001364     MOV    #3$,LOCK         ;SET RETURN ADDRESS FOR SW09
  (1)  012130  013700  002024        3$:  MOV    DZVTCR,R0        ;SET ADDRESS TO TEST
  (1)  012134  011001                     MOV    (R0),R1          ;READ THE ADDRESS
  (1)  012136  000240                     NOP
  (1)  012140  005010                     CLR    (R0)             ;WRITE THE ADDRESS
  (1)  012142  000240                     NOP
  (1)  012144  012737  012152  001364     MOV    #4$,LOCK         ;SET RETURN ADDRESS
  (1)  012152  013700  002030        4$:  MOV    DZVMSR,R0        ;SET ADDRESS TO TEST
  (1)  012156  011001                     MOV    (R0),R1          ;READ FROM ADDRESS
  (1)  012160  000240                     NOP
  (1)  012162  005010                     CLR    (R0)             ;WRITE THE ADDRESS
  (1)  012164  000240                     NOP                     ;
  (1)  012166  012737  000006  000004     MOV    #6,4             ;SET TRAP CATCHER BACK TO NORMAL
  (1)  012174  005037  000006             CLR    6                ;
  (1)  012200  104400                     ADVANCE                 ;SCOPE THIS TEST
  (1)  012202  011601                5$:  MOV    (SP),R1          ;SAVE PC OF TRAP
  (1)  012204  022626                     POP2SP                  ;POP TRAP OFF STACK
  (1)  012206  104001                     ERROR  1                ;*NO BUS REPLY RESPONSE.
  (1)  012210  104401                     SCOP1                   ;SW09=1?
  (1)  012212  000111                     JMP    (R1)             ;RTI
 8711                                    ;************************* TEST 2 *********************************
 8712                                    ;*THIS TEST PROVES THAT BIT "DCLR"
 8713                                    ;*CAN BE SET AND THAT IT WILL CLEAR
 8714                                    ;*BY ITSELF
 8716                              ;:*  TEST 2
  (5)                              ;;*************************************************************************
  (4)  012214  000004              TST2:  SCOPE
  (4)
  (2)  012216  012737  000002  001246     MOV    #2,$TSTNM        ;LOAD THE NUMBER OF THIS TEST
  (2)  012224  012737  012260  001362     MOV    #TST3,NEXT       ;POINT TO THE START OF THE NEXT TEST
 8717  012232  013700  002010             MOV    DZVCSR,R0        ;SET POINTER
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 8718  012236  012710  000020                MOV     #DCLR,(R0)      ;SET DCLR
 8719  012242  005005                        CLR     R5              ;SET EXPECTED TO 0
 8720  012244  005003                        CLR     R3              ;DUAL LOOP COUNTER
 8721  012246  011004                2$:     MOV     (R0),R4         ;IS DCLR CLEAR?
 8722  012250  001403                        BEQ     3$              ;IF YES , GO TO THE NEXT TEST
 8723  012252  105203                        INCB    R3              ;IF NO,COUNT 1 OF 256 TICKS
 8724  012254  001374                        BNE     2$              ;HAS THE TIME EXPIRED? IF NO, GO TEST BIT AGAIN
 8725  012256  104002                        ERROR   2               ;*DCLR FAILED TO CLEAR
 8726  012260                        3$:
 8727                                        ;************************* TEST 3 *********************************
   (1)                                       ;*TEST TO VERIFY THAT THE R/W BITS OF THE
   (1)                                       ;*DZVCSR REGISTER CAN BE SET. THEN VERIFY THAT
   (1)                                       ;*THESE BITS CAN BE CLEARED. AND FINALLY, VERIFY
   (1)                                       ;*THAT AFTER BEING SET AGAIN THEY CAN BE
   (1)                                       ;*CLEARED BY A "DEVICE CLEAR".
   (1)                                       ;*THE BITS TESTED ARE:  MAINT, MSENAB, SILOEN,
   (1)                                       ;*RIE, AND TIE.
   (3)                                ;:*  TEST 3
   (6)                                ;;*************************************************************
   (5)  012260  000004                TST3:   SCOPE
   (5)
   (3)  012262  012737  000003  001246        MOV     #3,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
   (3)  012270  012737  012436  001362        MOV     #TST4,NEXT      ;POINT TO THE START OF THE NEXT TEST
   (1)  012276  013700  002010                MOV     DZVCSR,R0       ;GET BASE ADDRESS
   (1)  012302  012703  012416                MOV     #5$,R3          ;SET R3 TO TOP OF TABLE
   (1)  012306  011305                1$:     MOV     (R3),R5         ;SET BIT
   (1)  012310  012737  012316  001364        MOV     #11$,LOCK       ;SETUP FOR TIGHT SCOPE LOOP
   (1)  012316  010510                11$:    MOV     R5,(R0)         ;SET BIT IN DEVICE
   (1)  012320  011004                        MOV     (R0),R4         ;READ THE BIT FROM DEVICE
   (1)  012322  020504                        CMP     R5,R4           ;WAS BIT SET?
   (1)  012324  001401                        BEQ     2$              ;BR IF YES
   (1)  012326  104002                        ERROR   2               ;*BIT R/W FAILURE
   (1)  012330  104401                2$:     SCOP1                   ;IS SWITCH 9 SET?
   (1)  012332  012737  012340  001364        MOV     #12$,LOCK       ;SET FOR NEXT TIGHT SCOPE LOOP
   (1)  012340  040510                12$:    BIC     R5,(R0)         ;CLEAR THE BIT.
   (1)  012342  011004                        MOV     (R0),R4         ;READ DEVICE
   (1)  012344  001403                        BEQ     3$              ;BR IF BITS WERE CLEARED.
   (1)  012346  005005                        CLR     R5              ;CLEAR FOR ERROR PRINTOUT
   (1)  012350  104002                        ERROR   2               ;*BIT FAILED TO CLEAR
   (1)  012352  011305                        MOV     (R3),R5         ;RESTORE THE BIT.
   (1)  012354  104401                3$:     SCOP1                   ;SW09 SET?
   (1)  012356  012737  012364  001364        MOV     #13$,LOCK       ;SET UP FOR NEXT TIGHT SCOPE
   (1)  012364  010510                13$:    MOV     R5,(R0)         ;SET THE BIT AGAIN
   (1)  012366  104413                        DEVICE.CLR              ;ISSUE DEVICE CLEAR
   (1)  012370  011004                        MOV     (R0),R4         ;READ THE BIT.
   (1)  012372  001403                        BEQ     4$              ;BR IF BIT CLEARED BY INIT (DEVICE CLEAR)
   (1)  012374  005005                        CLR     R5              ;SET EXPECTED TO ZERO
   (1)  012376  104002                        ERROR   2               ;*BIT NOT CLEARED BY DEVICE CLEAR
   (1)  012400  011305                        MOV     (R3),R5         ;RESTORE BIT AGAIN
   (1)  012402  104401                4$:     SCOP1                   ;SW09 SET?
   (1)  012404  062703  000002                ADD     #2,R3           ;POP R3
   (1)  012410  005713                        TST     (R3)            ;IS THIS THE END OF TABLE?
   (1)  012412  001407                        BEQ     6$              ;IF YES GET OUT
   (1)  012414  000734                        BR      1$              ;OTHERWISE TEST NEXT BIT
   (1)  012416  000010                5$:     #MAINT                  ;CSR BIT: INTERNAL MAINTENANCE
   (1)  012420  000040                        #MSENAB                 ;CSR BIT: MASTER SCAN ENABLE
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(1)  012422  010000                        #SILOEN                 ;CSR BIT: SILO ENABLE
(1)  012424  000100                        #RIE                    ;CSR BIT: RECEIVER INTER. ENABLE
(1)  012426  040000                        #TIE                    ;CSR BIT: TRANS. INTER. ENABLE
(1)  012430  000000                        #0                      ;END OF TABLE
(1)  012432  005037  001364          6$:   CLR     LOCK            ;ZERO LOCK INDICATOR
8728
 (1)                                       ;************************ TEST 4 *******************************
 (1)                                       ;*THIS TESTS THAT ALL OF THE TCR BITS
 (1)                                       ;*CAN BE: SET, CLEARED, AND CLEARED BY A DEVICE CLEAR.
 (1)                                       ;*THIS TEST ALSO DETERMINES IF THE DTR BITS CAN
 (1)                                       ;*BE SET, CLEARED, AND CLEARED BY A RESET.
 (3)                                  ;:*  TEST 4
 (6)                                  ;;*************************************************************
 (5)  012436  000004                  TST4:  SCOPE
 (5)
 (3)  012440  012737  000004  001246         MOV     #4,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
 (3)  012446  012737  012642  001362         MOV     #TST5,NEXT      ;POINT TO THE START OF THE NEXT TEST
 (1)  012454  013700  002024                 MOV     DZVTCR,R0       ;SET DEVICE ADDRESS
 (1)  012460  012703  012546                 MOV     #5$,R3          ;SET R3 POINTER TO TOP OF TABLE
 (1)  012464  012737  012474  001364  1$:    MOV     #11$,LOCK       ;SET LOCK FOR SW09 SCOPE LOOP
 (1)  012472  011305                         MOV     (R3),R5         ;SET EXPECTED RESULTS
 (1)  012474  010510                  11$:   MOV     R5,(R0)         ;SET THE BIT
 (1)  012476  011004                         MOV     (R0),R4         ;READ THE BIT FROM THE DEVICE
 (1)  012500  020504                         CMP     R5,R4           ;DID THE BIT SET?
 (1)  012502  001401                         BEQ     2$              ;BR IF YES
 (1)  012504  104002                         ERROR   2               ;*BIT FAILED TO SET.
 (1)  012506  104401                  2$:    SCOP1                   ;SW09 SET?
 (1)  012510  012737  012516  001364         MOV     #3$,LOCK        ;SET UP FOR NEXT TIGHT SCOPE LOOP
 (1)  012516  040510                  3$:    BIC     R5,(R0)         ;CLEAR THE BIT
 (1)  012520  011004                         MOV     (R0),R4         ;READ THE REGISTER
 (1)  012522  001403                         BEQ     4$              ;BR IF YES
 (1)  012524  005005                         CLR     R5              ;SET EXPECTED TO 0
 (1)  012526  104002                         ERROR   2               ;*REPORT BIT NOT CLEAR
 (1)  012530  011305                         MOV     (R3),R5         ;RESTORE R5
 (1)  012532  104401                  4$:    SCOP1                   ;SW09 SET?
 (1)  012534  062703  000002                 ADD     #2,R3           ;POP POINTER TO NEXT TABLE ENTRY
 (1)  012540  005713                         TST     (R3)            ;END OF TABLE?
 (1)  012542  001412                         BEQ     6$              ;IF YES JUMP OVER TABLE
 (1)  012544  000747                         BR      1$              ;START TESTING NEXT BIT
 (1)  012546  000001                  5$:    #TCR0                   ;TCR BIT FOR LINE 0
 (1)  012550  000002                         #TCR1                   ;TCR BIT FOR LINE 1
 (1)  012552  000004                         #TCR2                   ;TCR BIT FOR LINE 2
 (1)  012554  000010                         #TCR3                   ;TCR BIT FOR LINE 3
 (1)  012556  000400                         #DTR0                   ;DTR BIT FOR LINE 0
 (1)  012560  001000                         #DTR1                   ;DTR BIT FOR LINE 1
 (1)  012562  002000                         #DTR2                   ;DTR BIT FOR LINE 2
 (1)  012564  004000                         #DTR3                   ;DTR BIT FOR LINE 3
 (1)  012566  000000                         #0                      ;END OF TABLE
 (1)  012570  005037  001364          6$:    CLR     LOCK            ;CLEAR TIGHT SCOPE LOOP INDIC.
 (1)  012574  012710  177777                 MOV     #-1,(R0)        ;SET ALL BITS IN TCR REGISTER
 (1)  012600  012705  007400                 MOV     #007400,R5      ;SET EXPECTED
 (1)  012604  104413                         DEVICE.CLR              ;SET DCLR BIT IN CSR
 (1)  012606  011004                         MOV     (R0),R4         ;READ REGISTER
 (1)  012610  020504                         CMP     R5,R4           ;TCR BITS CLEARED?
 (1)  012612  001401                         BEQ     7$              ;IF YES BRANCH
 (1)  012614  104002                         ERROR   2               ;TCR BITS NOT CLEARED!
 (1)  012616  005005                  7$:    CLR     R5              ;SET EXPECTED TO ZERO
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   (1)  012620  005227  000000          8$:     INC     #0              ;DELAY FOR ACT
   (1)  012624  001375                          BNE     8$              ;
   (1)  012626  012710  177777                  MOV     #-1,(R0)        ;SET ALL POSSIBLE BITS
   (1)  012632  000005                          RESET                   ;DO BUS INIT
   (1)  012634  011004                          MOV     (R0),R4         ;DID REGISTER CLEAR?
   (1)  012636  001401                          BEQ     9$              ;IF YES GET OUT
   (1)  012640  104002                          ERROR   2               ;REGISTER DID NOT CLEAR!
   (1)  012642                          9$:
  8729                                          ;************************* TEST 5 *******************************
   (1)                                          ;*THIS TEST VERIFIES THAT
   (1)                                          ;*BITS 'RDONE,TRDY, BIT9, BIT8,
   (1)                                          ;*AND SILOAL'' ARE READ ONLY AND THAT TRDY IS
   (1)                                          ;*ZERO UNTIL A LINE IS SELECTED AND MSENAB IS SET.
   (1)                                          ;*
   (3)                                  ;:*  TEST 5
   (6)                                  ;;*************************************************************************
   (5)  012642  000004                  TST5:   SCOPE
   (5)
   (3)  012644  012737  000005  001246          MOV     #5,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
   (3)  012652  012737  012744  001362          MOV     #TST6,NEXT      ;POINT TO THE START OF THE NEXT TEST
   (1)  012660  013700  002010                  MOV     DZVCSR,R0       ;SET ADDRESS TO R0
   (1)  012664  104413                          DEVICE.CLR              ;DO A DEVICE CLEAR
   (1)  012666  005005                          CLR     R5              ;SET EXPECTED TO 0
   (1)  012670  012710  121600                  MOV     #RDONE+TRDY+BIT9+BIT8+SILOAL,(R0)
   (1)                                                                  ;WRITE THE BITS
   (1)  012674  011004                          MOV     (R0),R4         ;READ BACK THE BITS
   (1)  012676  001401                          BEQ     2$              ;BR IF NONE ARE SET.
   (1)  012700  104002                          ERROR   2               ;*BITS WERE SET.
   (1)  012702  012705  100040          2$:     MOV     #TRDY+MSENAB,R5 ;SET EXPECTED BIT
   (1)  012706  052777  000017  167110          BIS     #17,@DZVTCR     ;SET TCR BITS FOR ALL LINES
   (1)  012714  052710  000040                  BIS     #MSENAB,(R0)    ;SET SCAN ENABLE
   (1)  012720  005002                          CLR     R2              ;SET COUNTER TO ZERO
   (1)  012722  011004                  3$:     MOV     (R0),R4         ;READ THE REGISTER
   (1)  012724  042704  001400                  BIC     #BIT9!BIT8,R4   ;MASK OUT LINE NO.
   (1)  012730  020504                          CMP     R5,R4           ;BIT SET?
   (1)  012732  001404                          BEQ     4$              ;BR IF YES
   (1)  012734  104414                          DELAY                   ;STALL TIME
   (1)  012736  005202                          INC     R2              ;UPDATE COUNTER
   (1)  012740  001370                          BNE     3$              ;BR IF COUNTER NOT DONE.
   (1)  012742  104002                          ERROR   2               ;*TRDY NOT SET!
   (1)  012744                          4$:
  8730                                          ;************************* TEST 6 *******************************
  8731                                          ;*THIS TEST VERIFIES THAT:
  8732                                          ;*TIE,SILOEN,RIE,MSENAB,AND MAINT ARE THE
  8733                                          ;*ONLY R/W BITS IN THE DZVCSR AND THAT
  8734                                          ;*SETTING 'DCLR'' IN THE CSR WILL CLEAR THESE BITS.
  8736                                  ;:*  TEST 6
   (5)                                  ;;*************************************************************************
   (4)  012744  000004                  TST6:   SCOPE
   (4)
   (2)  012746  012737  000006  001246          MOV     #6,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
   (2)  012754  012737  013074  001362          MOV     #TST7,NEXT      ;POINT TO THE START OF THE NEXT TEST
  8737  012762  104413                          DEVICE.CLR              ;SET DCLR IN CSR
  8738  012764  013700  002010                  MOV     DZVCSR,R0       ;SET UP FOR ERROR MESSAGE
  8739  012770  012710  177757                  MOV     #^C<DCLR>,(R0)  ;TRY TO SET ALL BITS EXCEPT DCLR
  8740  012774  012705  050150                  MOV     #TIE!SILOEN!RIE!MSENAB!MAINT,R5 ;MAKE EXPECTED
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8741  013000  011004                        MOV     (R0),R4         ;ACTUAL
8742  013002  020405                        CMP     R4,R5           ;CMP EXPECTED VS ACTUAL
8743  013004  001401                        BEQ     1$              ;YES
8744  013006  104002                        ERROR   2               ;*NO
8745  013010  105010                1$:     CLRB    (R0)            ;CLEAR LOW BYTE OF CSR
8746  013012  105005                        CLRB    R5              ;CLEAR LOW BYTE OF EXPECTED DATA
8747  013014  011004                        MOV     (R0),R4         ;READ CSR
8748  013016  020405                        CMP     R4,R5           ;DOES CSR COMPARE WITH EXPECTED?
8749  013020  001401                        BEQ     3$              ;BRANCH IF YES
8750  013022  104002                        ERROR   2               ;IF NOT PRINT ERROR
8751  013024  012710  177757        3$:     MOV     #^C<DCLR>,(R0)  ;SET ALL CSR BITS POSSIBLE
8752  013030  105077  166756                CLRB    @HDZVCSR        ;CLEAR HIGH BYTE OF CSR
8753  013034  012705  000150                MOV     #RIE!MSENAB!MAINT,R5    ;SET EXPECTED IN R5
8754  013040  011004                        MOV     (R0),R4         ;READ CSR REGISTER
8755  013042  020405                        CMP     R4,R5           ;DOES ACTUAL=EXPECTED
8756  013044  001401                        BEQ     4$              ;IF YES CONTINUE
8757  013046  104002                        ERROR   2               ;IF NO PRINT ERROR
8758  013050  012710  177757        4$:     MOV     #^C<DCLR>,(R0)  ;SET ALL POSSIBLE CSR BITS
8759  013054  005005                        CLR     R5              ;SET R5 TO EXPECTED RESULTS
8760  013056  052710  000020                BIS     #DCLR,(R0)      ;DEVICE MASTER RESET
8761  013062  000240                        NOP
8762  013064  011004                        MOV     (R0),R4         ;ACTUAL
8763  013066  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
8764  013070  001401                        BEQ     2$              ;YES
8765  013072  104002                        ERROR   2               ;*NO
8766  013074                         2$:
8767                                        ;************************* TEST 7 *******************************
 (1)                                        ;*THIS TEST PERFORMS RESET TESTING AND
 (1)                                        ;*TESTING OF READ ONLY REGISTER DZVRBUF
 (1)                                        ;*AND TESTING OF WRITE ONLY REGISTER DZVLPR
 (3)                                ;:*  TEST 7
 (6)                                ;:*************************************************************************
 (5)  013074  000004                TST7:   SCOPE
 (5)
 (3)  013076  012737  000007  001246        MOV     #7,$TSTNM       ;LOAD THE NUMBER OF THIS TEST
 (3)  013104  012737  013160  001362        MOV     #TST10,NEXT     ;POINT TO THE START OF THE NEXT TEST
 (1)  013112  104413                        DEVICE.CLR              ;CLEAR DZV11
 (1)  013114  013700  002014                MOV     DZVRBUF,R0      ;SET UP FOR ERROR MESSAGE
 (1)  013120  011005                        MOV     (R0),R5         ;COPY PRESENT CONTENTS
 (1)  013122  042705  106000                BIC     #DVALID!BIT11!BIT10,R5 ;CLEAR ILLEGAL BITS
 (1)  013126  012777  177777  166664        MOV     #-1,@DZVLPR     ;TRY TO WRITE ALL 1'S
 (1)  013134  011004                        MOV     (R0),R4         ;ACTUAL
 (1)  013136  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
 (1)  013140  001401                        BEQ     1$              ;IF YES,GO CONTINUE PROCESSING
 (1)  013142  104002                        ERROR   2               ;*ERROR- BIT PATTERN NOT CORRECT
 (1)  013144  005077  166650        1$:     CLR     @DZVLPR ;TRY TO WRITE ALL ZEROES
 (1)  013150  011004                        MOV     (R0),R4         ;READ REGISTER
 (1)  013152  020405                        CMP     R4,R5           ;CMP ACTUAL VS. EXPECTED
 (1)  013154  001401                        BEQ     2$              ;BRANCH IF EQUAL
 (1)  013156  104002                        ERROR   2               ;VALUES DID NOT COMPARE
 (1)  013160                        2$:
8768                                        ;************************* TEST 10 *******************************
 (1)                                        ;*THIS TEST PERFORMS RESET TESTING AND
 (1)                                        ;*TESTING OF READ ONLY REGISTER DZVMSR
 (1)                                        ;*AND TESTING OF WRITE ONLY REGISTER DZVTDR
 (3)                                ;:*  TEST 10
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(6)
(5)  013160  000004                    ;;*****************************************************************
(5)                                    TST10:  SCOPE
(5)
(3)  013162  012737  000010  001246             MOV     #10,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)  013170  012737  013244  001362             MOV     #TST11,NEXT     ;POINT TO THE START OF THE NEXT TEST
(1)  013176  104413                             DEVICE.CLR              ;CLEAR DZV11
(1)  013200  013700  002030                     MOV     DZVMSR,R0       ;SET UP FOR ERROR MESSAGE
(1)  013204  011005                             MOV     (R0),R5         ;COPY PRESENT CONTENTS
(1)  013206  042705  170360                     BIC     #170360,R5      ;CLEAR ILLEGAL BITS
(1)  013212  112777  177777  166614             MOVB    #-1,@DZVTDR     ;TRY TO WRITE ALL 1'S
(1)  013220  011004                             MOV     (R0),R4         ;ACTUAL
(1)  013222  020405                             CMP     R4,R5           ;CMP ACTUAL VS EXPECTED
(1)  013224  001401                             BEQ     1$              ;IF YES,GO CONTINUE PROCESSING
(1)  013226  104002                             ERROR   2               ;*ERROR- BIT PATTERN NOT CORRECT
(1)  013230  005077  166600             1$:     CLR     @DZVTDR ;TRY TO WRITE ALL ZEROES
(1)  013234  011004                             MOV     (R0),R4         ;READ REGISTER
(1)  013236  020405                             CMP     R4,R5           ;CMP ACTUAL VS. EXPECTED
(1)  013240  001401                             BEQ     2$              ;BRANCH IF EQUAL
(1)  013242  104002                             ERROR   2               ;VALUES DID NOT COMPARE
(1)  013244                             2$:
8769
8770                                            ;************************** TEST 11 *******************************
8771                                            ;*VERIFY THAT SETTING "DTR" FOR A LINE WILL
8772                                            ;*BRING UP "CO" AND "RING" FOR:
8773                                            ;*THE SAME LINE IF IN EXTERNAL MODE
8774                                            ;*THE STAGGERED LINE IF IN STAGGERED MODE.
8775                                            ;*LINES ARE STAGGERED AS FOLLOWS:
8776                                            ;*LINE0 WITH LINE1; LINE2 WITH LINE3.
8777                                            ;*THIS TEST IS ONLY RUN IF AN H325,OR H329
8778                                            ;*IS CONNECTED ON THE DZV UNDER TEST.
8780
8781                                    ;:*  TEST 11
 (5)                                    ;;*****************************************************************
 (4)  013244  000004                    TST11:  SCOPE
 (4)
 (2)  013246  012737  000011  001246             MOV     #11,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (2)  013254  012737  013440  001362             MOV     #TST12,NEXT     ;POINT TO THE START OF THE NEXT TEST
8782  013262  005737  001372                     TST     MODE            ;TEST TO SEE IF TESTING WITH
8783  013266  001001                             BNE     8$              ;CONNECTOR
8784  013270  104400                             ADVANCE                 ;IF NO, GO TO NEXT TEST
8785  013272  012737  013362  001364     8$:     MOV     #10$,LOCK       ;SET FOR TIGHT SCOPE LOOP
8786  013300  104413                             DEVICE.CLR              ;SET DCLR IN CSR TO ZERO DEVICE
8787  013302  013700  002030                     MOV     DZVMSR,R0       ;SET REGISTER
8788  013306  005003                             CLR     R3              ;ZERO LINE NUMBER
8789  013310  012702  000001                     MOV     #1,R2           ;SET POINTER
8790  013314  130237  001366             1$:     BITB    R2,LINE         ;TEST THIS LINE?
8791  013320  001003                             BNE     3$              ;YES
8792  013322  005203                     2$:     INC     R3              ;LINE #
8793  013324  104420                             SHIFT                   ;GET NEXT LINE
8794  013326  000772                             BR      1$              ;TEST NEXT LINE
8795  013330  010204                     3$:     MOV     R2,R4           ;SAVE BINARY BIT FOR LINE #
8796  013332  105737  001372                     TSTB    MODE            ;RUNNING IN EXTERNAL MODE?
8797  013336  100406                             BMI     5$              ;IF YES SKIP STAGGERED SETUP
8798  013340  032703  000001                     BIT     #BIT0,R3        ;IF EVEN LINE
8799  013344  001402                             BEQ     4$              ;GO GET ODD PARTNER
8800  013346  006204                             ASR     R4              ;OTHERWISE GET EVEN COMPANION
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 8801  013350  000401                          BR      5$              ;GO SETUP EXPECTED RESULTS
 8802  013352  006304                  4$:     ASL     R4              ;FIND ODD PARTNER
 8803  013354  010405                  5$:     MOV     R4,R5           ;LOAD R5 FOR EXPECTED
 8804  013356  000305                          SWAB    R5              ;PLACE IN UPPER BYTE
 8805  013360  150405                          BISB    R4,R5           ;SET FOR RING BITS
 8806  013362  150277  166440          10$:    BISB    R2,@HDZVTCR     ;SET DTR BIT
 8807  013366  104414                          DELAY                   ;DELAY FOR CABLE LAG
 8808  013370  011004                          MOV     (R0),R4         ;MOVE RESULTS OF MSR REGISTER TO R4
 8809  013372  020504                          CMP     R5,R4           ;RESULTS=EXPECTED?
 8810  013374  001401                          BEQ     6$              ;IF YES CONTINUE
 8811  013376  104002                          ERROR   2               ;IF NOT PRINT ERROR RESULTS
 8812  013400  104401                  6$:     SCOP1                   ;IS SW09 SET?
 8813  013402  012737  013410  001364          MOV     #11$,LOCK       ;SET UP FOR NEXT TIGHT SCOPE
 8814  013410  140277  166412          11$:    BICB    R2,@HDZVTCR     ;CLEAR  DTR BIT FOR LINE UNDER TEST
 8815  013414  104414                          DELAY                   ;DELAY FOR CABLE LAG
 8816  013416  011004                          MOV     (R0),R4         ;LOAD MSR REGISTER INTO R4
 8817  013420  001402                          BEQ     7$              ;IF CO AND RING CLEARED CONTINUE
 8818  013422  005005                          CLR     R5              ;OTHERWISE SET EXPECTED FOR ERROR
 8819  013424  104002                          ERROR   2               ;PRINTOUT
 8820  013426  104401                  7$:     SCOP1                   ;IS SW09 SET?
 8821  013430  012737  013362  001364          MOV     #10$,LOCK       ;RESET TIGHT SCOPE LOOP
 8822  013436  000731                          BR      2$              ;GET NEXT LINE
 8823
 8824                                          ;************************* TEST 12 ******************************
  (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 8-9 OF DZVCSR CORRESPOND
  (1)                                          ;* TO THE LINE SELECTED IN DZVTCR
  (3)                                  ;:*  TEST 12
  (6)                                  ;;*************************************************************************
  (5)  013440  000004                  TST12:  SCOPE
  (5)
  (3)  013442  012737  000012  001246          MOV     #12,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (3)  013450  012737  013572  001362          MOV     #TST13,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  013456  104413                          DEVICE.CLR              ;ISSUE A "DEVICE CLEAR" (RESET)
  (1)  013460  012737  013514  001364          MOV     #2$,LOCK        ;SET UP FOR TIGHT SCOPE LOOP
  (1)  013466  005037  001374                  CLR     SAVLIN          ;INITIALIZE FOR ERROR PRINTOUT
  (1)  013472  013700  002010                  MOV     DZVCSR,R0       ;SET POINTER
  (1)  013476  012705  100040                  MOV     #MSENAB!TRDY,R5 ;START THE EXPECTED LINE NUMBER AT 0
  (1)  013502  012702  000001                  MOV      #1,R2          ;USING R2 AS A BIT POINTER, POINT TO LINE 0
  (1)  013506  130237  001366          1$:     BITB    R2,LINE         ;IS THIS LINE SELECTED?
  (1)  013512  001421                          BEQ     6$              ;IF NO, SKIP THE STARTUP
  (1)  013514  050277  166304          2$:     BIS     R2,@DZVTCR      ;SET THE GO BIT FOR THIS LINE
  (1)  013520  052710  000040                  BIS     #MSENAB,(R0)    ;START THE SCANNER
  (1)  013524  005004                          CLR     R4              ;SET FOR DELAY
  (1)  013526  005710                  3$:     TST     (R0)            ;TX READY?
  (1)  013530  100404                          BMI     4$              ;BR IF YES
  (1)  013532  104414                          DELAY                   ;DELAY
  (1)  013534  005204                          INC     R4              ;COUNTER
  (1)  013536  001373                          BNE     3$              ;BR IF <>0!
  (1)  013540  104003                          ERROR   3               ;*TX NOT READY!
  (1)  013542  011004                  4$:     MOV     (R0),R4         ;GET THE LINE POINTED TO BY THE SCANNER
  (1)  013544  020405                          CMP     R4,R5           ;IS THE LINE NUMBER WHAT IT SHOULD BE?
  (1)  013546  001401                          BEQ     5$              ;IF YES,GO WORK ON THE NEXT LINE
  (1)  013550  104002                          ERROR   2               ;*LINE NUMBER DID NOT MATCH TCR BIT
  (1)  013552  104401                  5$:     SCOP1                   ;IS SW09 SET?
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  (1)  013554  104413                        DEVICE.CLR              ;SET DCLR IN CSR;SETUP FOR NEXT LINE
  (1)  013556  062705  000400          6$:    ADD     #400,R5         ;POINT TO THE NEXT EXPECTED LINE
  (1)  013562  104420                        SHIFT                   ;POINT TO THE NEXT LINE.ARE ALL LINES TESTED?
  (1)  013564  005237  001374                INC     SAVLIN          ;ADJUST FOR ERROR PRINTOUT
  (1)  013570  000746                        BR      1$              ;IF NOT, GO DO THE NEXT LINE
 8825                                        ;************************ TEST 13 *********************************
 8826                                        ;*TEST TO TRANSMIT ONE CHAR AND
 8827                                        ;*RECEIVE ONE CHAR ON ONE LINE
 8828                                        ;*AT A TIME. THE CHAR IS "252" AND
 8829                                        ;*ALL SELECTED LINES WILL BE TURNED ON .
 8830                                        ;*THIS IS THE FIRST TIME ANY
 8831                                        ;*DATA IS CHECKED IN THE RECEIVER.
 8832                                        ;*USING SWITCH NINE WITH THIS TEST CREATES A TIGHT SCOPE LOOP
 8833                                        ;*WHICH TRANSMITS A STEADY STREAM OF CHARACTERS.
 8835                                  ;:*  TEST 13
  (5)                                  ;;*****************************************************************
  (4)  013572  000004                  TST13: SCOPE
  (4)
  (2)  013574  012737  000013  001246        MOV     #13,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)  013602  012737  014062  001362        MOV     #TST14,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  013610  012737  014044  001364        MOV     #16$,LOCK       ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
 8836  013616  104417                        DCLASM                  ;SET DCLR IN CSR AND SET MAINT MODE
 8837  013620  104421                        LPRSET                  ;LOAD LPR REGISTER FOR ALL LINES
 8838  013622  005037  001374                CLR     SAVLIN          ;INIT. FOR ERROR PRINTOUT
 8839  013626  105037  001425                CLRB    DONFLG          ;INIT FOR TCR BIT HANDLER
 8840  013632  012702  000001                MOV     #1,R2           ;LINE POINTER
 8841  013636  012701  000252                MOV     #252,R1         ;SAVE CHARACTER TO BE TRANSMITTED
 8842  013642  052777  000040  166140        BIS     #MSENAB,@DZVCSR ;START SCANNER
 8843  013650  030237  001366          3$:   BIT     R2,LINE         ;VALID LINE ?
 8844  013654  001467                        BEQ     15$             ;NO SET UP NEXT LINE
 8845  013656  010277  166142                MOV     R2,@DZVTCR      ;SET TCR BIT
 8846  013662  005005                  5$:   CLR     R5              ;SET R5 FOR A DELAY LOOP
 8847  013664  105777  166120                TSTB    @DZVCSR         ;IS REC DONE = 0 ?
 8848  013670  100001                        BPL     6$              ;IF YES, ALLOW TIME FOR TRDY TO SET
 8849  013672  104020                        ERROR   20              ;*REC DONE SHOULD = 0
 8850  013674  005777  166110          6$:   TST     @DZVCSR         ;TRDY SET?
 8851  013700  100404                        BMI     7$              ;IF YES BRANCH
 8852  013702  104414                        DELAY                   ;IF NO THEN WAIT FOR IT
 8853  013704  005205                        INC     R5              ;DELAY LOOP
 8854  013706  001372                        BNE     6$              ;BRANCH BACK AND TEST AGAIN
 8855  013710  104003                        ERROR   3               ;*TRDY FAILED TO SET!
 8856  013712  105737  001425          7$:   TSTB    DONFLG          ;HAVE WE ALREADY SENT CHARAC.
 8857  013716  001041                        BNE     13$             ;IF YES GO CLEAR TCR BIT
 8858  013720  105237  001425                INCB    DONFLG          ;IF NOT INDICATE HAVING BEEN HERE
 8859  013724  110177  166104                MOVB    R1,@DZVTDR      ;LOAD CHARACTER
 8860  013730  013705  001374                MOV     SAVLIN,R5       ;MAKE EXPECTED LINE #
 8861  013734  005737  001372                TST     MODE            ;IS THIS TEST IN STAGGERED MODE?
  (1)  013740  100006                        BPL     10$             ;IF NUT, SKIP STAGGERED SETUP
  (1)
  (1)                                       ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  013742  006205                        ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  013744  103402                        BCS     8$              ;IF IT IS SET, GO CLEAR IT
  (1)  013746  000261                        SEC                     ;IF IT IS CLEAR SET IT HERE
  (1)  013750  000401                        BR      9$              ;SKIP THE CLEARING
  (1)  013752  000241          8$:           CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
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 (1)  013754  006105                 9$:    ROL     R5              ;GET THE NEW BIT BACK INTO R5
8862  013756  000305                 10$:   SWAB    R5              ;MOVE THE LINE NUMBER TO THE UPPER BYTE
8863  013760  150105                        BISB    R1,R5           ;ADD CHARACTER
8864  013762  052705  100000               BIS     #DVALID,R5      ;ADD DATA VALID
8865  013766  005003                        CLR     R3
8866  013770  105777  166014         11$:   TSTB    @DZVCSR         ;IS RDONE SET?
8867  013774  100404                        BMI     12$             ;IF YES GO GET CHAR.
8868  013776  104414                        DELAY                   ;IF NOT THEN WAIT
8869  014000  005203                        INC     R3              ;DELAY LOOP
8870  014002  001372                        BNE     11$             ;DELAY DONE?
8871  014004  104004                        ERROR   4               ;*RDONE FAILED TO SET!
8872  014006  017704  166002         12$:   MOV     @DZVRBUF,R4     ;LOAD THE VALUE ACTUALLY RECEIVED
8873  014012  020405                        CMP     R4,R5           ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
8874  014014  001722                        BEQ     5$              ;IF YES, GO DO THE NEXT LINE
8875  014016  104006                        ERROR   6               ;*NO DATA/CONTENTS DID NOT COMPARE
8876  014020  000720                        BR      5$              ;GO BACK AND WAIT TO CLEAR TCR BIT
8877  014022  104401                 13$:   SCOP1                   ;CHECK TO SEE IF SWITCH NINE IS SET
8878  014024  105037  001425               CLRB    DONFLG          ;SET UP FOR NEXT LINE
8879  014030  005077  165770               CLR     @DZVTCR         ;CLEAR PREVIOUS TCR BIT
8880  014034  005237  001374         15$:   INC     SAVLIN          ;SET LINE INDICATOR FOR NEXT LINE
8881  014040  104420                        SHIFT                   ;CALCULATE NEXT LINE
8882  014042  000702                        BR      3$              ;GET GET STARTED
8883
8884                                 ;TIGHT SCOPE LOOP FOR THIS TEST. LOOP TRANSMITS CHARACTERS ONLY
8885
8886  014044  005777  165740         16$:   TST     @DZVCSR         ;IS TRANSMITTER READY?
8887  014050  100375                        BPL     16$             ;IF NOT, WAIT FOR IT
8888  014052  110177  165756               MOVB    R1,@DZVTDR      ;LOAD THE CHARACTER
8889  014056  104401                        SCOP1                   ;LOOP AGIN IF SW09=1
8890  014060  000760                        BR      13$             ;OTHERWISE, GO PICK UP THE TEST NORMALLY
8891
8892                                 ;************************* TEST 14 *********************************
8893                                 ;*THIS TEST VERIFIES THAT EACH RECEIVING LINE CAN BE
8894                                 ;*DISABLED BY SETTING RCVON (BIT12 IN THE LPR REGISTER)
8895                                 ;*TO ZERO FOR EACH LINE.
8896                                 ;*THIS TEST ALSO VERIFIES THAT THE SILO CAN BE
8897                                 ;*EMPTIED BY ISSUING A DEVICE MASTER CLEAR.
8899                           ;:*  TEST 14
 (5)                           ;;*****************************************************************
 (4)  014062  000004           TST14: SCOPE
 (4)
 (2)  014064  012737  000014  001246        MOV     #14,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (2)  014072  012737  014404  001362        MOV     #TST15,NEXT     ;POINT TO THE START OF THE NEXT TEST
8900  014100  105037  001425               CLRB    DONFLG          ;CLEAR TEST CONTROL FLAG
8901  014104  005037  001374               CLR     SAVLIN          ;CLEAR LINE INDICATOR
8902  014110  104417                        DCLASM                  ;ISSUE A DEVICE MASTER CLEAR
8903                                                                 ;AND SET MAINT BIT IF NECESSARY
8904  014112  013701  001370               MOV     PAR,R1          ;SAVE DEFAULT PARAMETERS
8905  014116  042737  010000  001370        BIC     #RCVON,PAR      ;DISABLE RECEIVER IN DEFAULT PAR.
8906  014124  104421                 100$:  LPRSET                  ;LOAD PARAMETERS IN LPR REGISTER
8907  014126  010137  001370               MOV     R1,PAR          ;RESTORE DEFAULT PARAMETERS
8908  014132  012701  000252               MOV     #252,R1         ;LOAD A CHARAC. INTO R1
8909  014136  013702  001366               MOV     LINE,R2         ;COPY AN IMAGE OF THE ACTIVE LINES
8910  014142  010277  165656               MOV     R2,@DZVTCR      ;SET TCR BITS FOR ALL ACTIVE LINES
8911  014146  052777  000040  165634        BIS     #MSENAB,@DZVCSR ;SET MASTER SCAN ENABLE
8912  014154  005005                 1$:    CLR     R5              ;INIT DELAY COUNTER
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 8913  014156  005777  165626          2$:     TST     @DZVCSR         ;IS TRANS READY SET?
 8914  014162  100404                          BMI     3$              ;BRANCH IF YES
 8915  014164  104414                          DELAY                   ;WAIT FOR TRDY TO SET
 8916  014166  005205                          INC     R5              ;INCREMENT DELAY COUNTER
 8917  014170  001372                          BNE     2$              ;RETURN TO CHECK TRDY
 8918  014172  104003                          ERROR   3               ;TRDY FAILED TO SET!
 8919  014174  117705  165612          3$:     MOVB    @HDZVCSR,R5     ;MOVE LINE NO. TO R5
 8920  014200  012703  000001                  MOV     #1,R3           ;INIT TCR POINTER
 8921  014204  042705  177774                  BIC     #^C<3>,R5       ;ISOLATE LINE NO.
 8922  014210  001403                          BEQ     31$             ;IF LINE 0 BRANCH
 8923  014212  106303                  30$:    ASLB    R3              ;SHIFT R3 POINTER TO NEXT LINE
 8924  014214  005305                          DEC     R5              ;DECREMENT LINE NO.
 8925  014216  001375                          BNE     30$             ;WHEN R5=0, R3 POINTS TO LINE TCR
 8926  014220  030302                  31$:    BIT     R3,R2           ;HAS CHARACTER BEEN SENT?
 8927  014222  001007                          BNE     4$              ;BRANCH IF NO
 8928  014224  140377  165574                  BICB    R3,@DZVTCR      ;IF YES THEN CLEAR TCR BIT
 8929  014230  001351                          BNE     1$              ;IF ALL CHARAC. SENT DROP THROUGH
 8930  014232  105737  001425                  TSTB    DONFLG          ;IF NO MORE ACTIVE IS THIS SECOND
 8931                                                                  ;TIME HERE?
 8932  014236  001037                          BNE     10$             ;IF YES SKIP TO SECOND PART OF TEST
 8933  014240  000404                          BR      5$              ;IF FIRST TIME HERE GO ZERO TCR BITS
 8934  014242  110177  165566          4$:     MOVB    R1,@DZVTDR      ;LOAD CHAR. INTO BUFFER
 8935  014246  040302                          BIC     R3,R2           ;INDICATE CHARAC. SENT ON THIS LINE
 8936  014250  000741                          BR      1$              ;GO BACK AND WAIT FOR TRDY TO SET
 8937  014252  005077  165546          5$:     CLR     @DZVTCR         ;CLEAR OUT TCR BITS
 8938  014256  005005                          CLR     R5              ;INIT DELAY COUNTER
 8939  014260  105777  165524          6$:     TSTB    @DZVCSR         ;IS RECEIV. DONE SET?
 8940  014264  100002                          BPL     7$              ;IF NOT THEN WAIT TO SEE IF IT WILL
 8941  014266  104020                          ERROR   20              ;REC DONE SHOULD NOT SET!
 8942  014270  000403                          BR      8$              ;GO FIND WHICH LINE RECEIVED
 8943  014272  104414                  7$:     DELAY                   ;STALL FOR RECEIVER
 8944  014274  005205                          INC     R5              ;INCREMENT DELAY COUNTER
 8945  014276  001370                          BNE     6$              ;IF NOT DONE GO RETEST REC DONE
 8946  014300  017704  165510          8$:     MOV     @DZVRBUF,R4     ;READ REC. BUFFER
 8947  014304  100007                          BPL     9$              ;IS DVALID SET?
 8948  014306  000304                          SWAB    R4              ;IF YES GET LINE NO.
 8949  014310  042704  177774                  BIC     #^C<3>,R4       ;ISOLATE LINE NO.
 8950  014314  010437  001374                  MOV     R4,SAVLIN       ;SET UP LINE NO. FOR ERROR REPORT
 8951  014320  104017                          ERROR   17              ;DVALID SHOULD NOT BE SET
 8952  014322  000766                          BR      8$              ;GO CHECK FOR ANY OTHER CHAR. IN SILO
 8953  014324  105237  001425          9$:     INCB    DONFLG          ;INDICATE THAT FIRST PART OF TEST IS DONE
 8954  014330  013701  001370                  MOV     PAR,R1          ;SAVE DEFAULT LINE PARAM.
 8955  014334  000673                          BR      100$            ;NOW GO RELOAD LPR REGISTER TO
 8956                                                                  ;TURN RECEIVERS ON
 8957  014336  005005                  10$:    CLR     R5              ;ZERO DELAY COUNTER
 8958  014340  104414                  11$:    DELAY                   ;WAIT FOR ALL CHARAC. TO BE RECEIVED
 8959  014342  005205                          INC     R5              ;INCREASE DELAY COUNT
 8960  014344  001375                          BNE     11$             ;CONT. DELAY IF NOT FINISHED
 8961  014346  104413                          DEVICE.CLR              ;ISSUE A MASTER CLEAR
 8962  014350  000240                          NOP
 8963  014352  000240                          NOP
 8964  014354  105777  165430                  TSTB    @DZVCSR         ;NOW IS RECEIV. DONE SET?
 8965  014360  100003                          BPL     12$             ;BRANCH IF NO
 8966  014362  005037  001374                  CLR     SAVLIN          ;CLEAR LINE NO FOR ERROR REPORT
 8967  014366  104020                          ERROR   20              ;REC. DONE SHOULD NOT BE SET!
 8968  014370  017704  165420          12$:    MOV     @DZVRBUF,R4     ;READ REC. BUFFER
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 8969  014374  100003                        BPL     13$             ;IS DVALID SET? IT SHOULDN'T BE
 8970  014376  005037  001374                CLR     SAVLIN          ;DEVICE. CLR DID NOT ZERO SILO
 8971  014402  104017                        ERROR   17              ;PRINT OUT THE ERROR.(LINE NO. IS IRRELEVANT)
 8972  014404                          13$:
 8973
 8974                                        ;************************** TEST 15 *********************************
 8975                                        ;* THIS TEST PROVES THAT THE TRANSMITTER TRANSMITS
 8976                                        ;*CHARACTERS (FLAG MODE)AND THE RECEIVER RECEIVES (FLAG MODE)
 8977                                        ;*(ONE LINE AT A TIME   BASED UPON VALID LINES)
 8978                                        ;*THIS IS THE FIRST TIME THAT ALL DATA IS CHECKED
 8980                                  ;:*  TEST 15
  (5)                                  ;;*****************************************************************
  (4)  014404  000004                  TST15:  SCOPE
  (4)
  (2)  014406  012737  000015  001246          MOV     #15,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)  014414  012737  014674  001362          MOV     #TST16,NEXT     ;POINT TO THE START OF THE NEXT TEST
  (1)  014422  012737  014510  001364          MOV     #5$,LOCK        ;USE THIS ADDRESS IF A TIGHT SCOPE LOOP IS SELECTED
 8981  014430  104417                        DCLASM                  ;SET DCLR AND SET MNTFLG
 8982  014432  104421                        LPRSET                  ;LOAD LPR REGISTER FOR ALL LINES
 8983  014434  005037  001374                CLR     SAVLIN          ;INIT FOR FIRST LINE
 8984  014440  104422                        BUFSET                  ;ZERO BUFFER AREA
 8985  014442  105037  001425                CLRB    DONFLG          ;ZERO TCR BIT HANDLER FLAG
 8986  014446  012702  000001                MOV     #1,R2           ;LINE POINTER
 8987  014452  052777  000040  165330        BIS     #MSENAB,@DZVCSR ;START SCANNER
 8988  014460  030237  001366          3$:   BIT     R2,LINE         ;VALID LINE ?
 8989  014464  001477                        BEQ     15$             ;NO SET UP NEXT LINE
 8990  014466  010277  165332                MOV     R2,@DZVTCR      ;SET TCR BIT
 8991  014472  013700  001374                MOV     SAVLIN,R0       ;ADJUST BUFFER POINTER
 8992  014476  006300                        ASL     R0              ;OFFSET
 8993  014500  105777  165304          4$:   TSTB    @DZVCSR         ;IS REC DONE = 0 ?
 8994  014504  100001                        BPL     5$              ;IF YES, ALLOW TIME FOR TRDY TO SET
 8995  014506  104020                        ERROR   20              ;*REC DONE SHOULD = 0
 8996  014510  005005                  5$:   CLR     R5              ;USE R5 AS TIMER WAITING FOR TRDY TO SET
 8997  014512  005777  165272          6$:   TST     @DZVCSR         ;IS THE TRANSMITTER READY?
 8998  014516  100404                        BMI     7$              ;IF SO, GO TRANSMIT A CHARACTER
 8999  014520  104414                        DELAY                   ;WAIT A LITTLE BIT
 9000  014522  005205                        INC     R5              ;UP THE LOCAL COUNTER.TIME EXCEEDED?
 9001  014524  001372                        BNE     6$              ;IF NOT, GO TRY AGAIN
 9002  014526  104003                        ERROR   3               ;*TRDY FAILED TO SET!
 9003  014530  105737  001425          7$:   TSTB    DONFLG          ;ALL CHARAC. TRANS.?
 9004  014534  001047                        BNE     14$             ;IF YES GO ZERO TCR BIT
 9005  014536  116077  001426  165270        MOVB    TDO(R0),@DZVTDR ;LOAD CHARACTER
 9006  014544  013705  001374                MOV     SAVLIN,R5       ;MAKE EXPECTED LINE #
 9007  014550  005737  001372                TST     MODE            ;IS THIS TEST IN STAGGERED MODE?
  (1)  014554  100006                        BPL     10$             ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                       ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  014556  006205                        ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  014560  103402                        BCS     8$              ;IF IT IS SET, GO CLEAR IT
  (1)  014562  000261                        SEC                     ;IF IT IS CLEAR SET IT HERE
  (1)  014564  000401                        BR      9$              ;SKIP THE CLEARING
  (1)  014566  000241                  8$:   CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
  (1)  014570  006105                  9$:   ROL     R5              ;GET THE NEW BIT BACK INTO R5
 9008  014572  000305                  10$:  SWAB    R5              ;MOVE THE LINE NUMBER TO THE UPPER BYTE
 9009  014574  156005  001426                BISB    TDO(R0),R5      ;ADD CHARACTER
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 9010  014600  052705  100000              BIS     #DVALID,R5      ;ADD DATA VALID
 9011  014604  005003                      CLR     R3
 9012  014606  105777  165176      11$:    TSTB    @DZVCSR         ;REC DONE?
 9013  014612  100404                      BMI     12$             ;IF YES GO CHECK CHAR.
 9014  014614  104414                      DELAY                   ;IF NOT WAIT FOR REC.
 9015  014616  005203                      INC     R3              ;DELAY LOOP TIMER
 9016  014620  001372                      BNE     11$             ;DELAY FINISHED?
 9017  014622  104004                      ERROR   4               ;*RDONE FAILED TO SET!
 9018  014624  017704  165164      12$:    MOV     @DZVRBUF,R4     ;LOAD THE VALUE ACTUALLY RECEIVED
 9019  014630  020405                      CMP     R4,R5           ;COMPARE ACTUAL VS EXPECTED. ARE THEY THE SAME?
 9020  014632  001401                      BEQ     13$             ;IF YES, GO DO THE NEXT LINE
 9021  014634  104006                      ERROR   6               ;*NO DATA/CONTENTS DID NOT COMPARE
 9022  014636  104401              13$:    SCOP1                   ;CHECK TO SEE IF SWITCH NINE IS SET
 9023  014640  105260  001426              INCB    TDO(R0)         ;INCREMENT BINARY PATTERN FOR THIS LINE
 9024  014644  001315                      BNE     4$              ;GO 'ROUND AGAIN FOR NEXT CHARACTER
 9025  014646  105237  001425              INCB    DONFLG          ;INDICATE ALL CHAR. SENT
 9026  014652  000712                      BR      4$              ;BRANCH TO CLEAR TCR BIT
 9027  014654  005077  165144      14$:    CLR     @DZVTCR         ;CLEAR TCR REGISTER
 9028  014660  105037  001425              CLRB    DONFLG          ;INIT FOR NEXT LINE
 9029  014664  005237  001374      15$:    INC     SAVLIN          ;INC EXPECTED LINE
 9030  014670  104420                      SHIFT                   ;SHIFT THE LINE POINTER. ARE WE ALL DONE?
 9031  014672  000672                      BR      3$              ;IF NO, GO AROUND AGAIN FOR NEXT LINE
 9032
 9033
 9034                                      ;************************* TEST 16 *********************************
 9035                                      ;*THIS TEST WILL PROVE THAT:
 9036                                      ;* 1) THE TRANSMITTER "BREAK BIT" WORKS
 9037                                      ;* 2) THE RECEIVER CAN FLAG "FRAMING ERRORS"
 9038                                      ;* 3) THE RECEIVER CAN FLAG "PARITY ERRORS"
 9039                                      ;*ONLY ONE LINE AT A TIME WILL BE EXERCISED.
 9041                              ;::*  TEST 16
  (5)                              ;;*****************************************************************
  (4)  014674  000004              TST16:  SCOPE
  (4)
  (2)  014676  012737  000016  001246      MOV     #16,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
  (2)  014704  012737  015076  001362      MOV     #TST17,NEXT     ;POINT TO THE START OF THE NEXT TEST
 9042  014712  012737  015022  001364      MOV     #5$,LOCK        ;SET FOR LOOP
 9043  014720  005037  001374              CLR     SAVLIN          ;INIT LINE INDIC. FOR ERROR PRINTOUT
 9044  014724  012702  000001              MOV     #1,R2           ;LINE POINTER
 9045  014730  030237  001366      1$:     BIT     R2,LINE         ;VALID LINE?
 9046  014734  001454                      BEQ     9$              ;IF NOT SET FOR NEXT LINE
 9047  014736  104417                      DCLASM                  ;SET DCLR IN CSR AND SET MNTFLG
 9048  014740  013701  001370              MOV     PAR,R1          ;PICK UP PARAMETERS
 9049  014744  052737  000300  001370      BIS     #ODDPAR!PARITY,PAR ;FORCE ODD PARITY
 9050  014752  104421                      LPRSET                  ;LOAD LPR REGISTER
 9051  014754  010137  001370              MOV     R1,PAR          ;RESET PAR TO ORIGINAL VALUE
 9052  014760  052777  000040  165022      BIS     #MSENAB,@DZVCSR ;START SCANNER
 9053  014766  013705  001374              MOV     SAVLIN,R5       ;MAKE EXPECTED DATA
 9054  014772  005737  001372              TST     MODE            ;IS THIS TEST IN STAGGERED MODE?
  (1)  014776  100006                      BPL     4$              ;IF NOT, SKIP STAGGERED SETUP
  (1)
  (1)                                      ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
  (1)
  (1)  015000  006205                      ASR     R5              ;GET THE LAST BIT INTO THE CARRY BIT
  (1)  015002  103402                      BCS     2$              ;IF IT IS SET, GO CLEAR IT
  (1)  015004  000261                      SEC                     ;IF IT IS CLEAR SET IT HERE
```

```
(1)  015006  000401                        BR      3$              ;SKIP THE CLEARING
(1)  015010  000241                2$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
(1)  015012  006105                3$:     ROL     R5              ;GET THE NEW BIT BACK INTO R5
9055 015014  000305                4$:     SWAB    R5              ;PUT LINE NUMBER IN UPPER BYTE
9056 015016  052705  130000                BIS     #DVALID!PARER!FRMERR,R5 ;ADD EXPECTED
9057 015022  005003                5$:     CLR     R3              ;INIT DELAY ACCUMULATOR
9058 015024  110277  165006                MOVB    R2,@HDZVTDR     ;SET BREAK BIT
9059 015030  105777  164754          6$:     TSTB    @DZVCSR         ;RECEIVER DONE?
9060 015034  100404                        BMI     7$              ;BRANCH IF YES
9061 015036  104414                        DELAY                   ;WAIT FOR REC DONE TO SET
9062 015040  005203                        INC     R3              ;INC DELAY LOOP
9063 015042  001372                        BNE     6$              ;DELAY FINISHED?
9064 015044  104004                        ERROR   4               ;*RDONE FAILED TO SET!
9065 015046  017704  164742          7$:     MOV     @DZVRBUF,R4     ;ACTUAL
9066 015052  020405                        CMP     R4,R5           ;CMP ACTUAL VS EXPECTED. DO THEY MATCH?
9067 015054  001401                        BEQ     8$              ;IF YES, GO CLEAN UP
9068 015056  104006                        ERROR   6               ;*DATA/CONTENTS FAILED TO COMPARE
9069 015060  105077  164752          8$:     CLRB    @HDZVTDR        ;CLEAR BREAK BITS
9070 015064  104401                        SCOP1                   ;LOOP?
9071 015066  005237  001374          9$:     INC     SAVLIN          ;INC LINE #
9072 015072  104420                        SHIFT                   ;SET R2 TO NEXT LINE
9073 015074  000715                        BR      1$              ;GO BACK AND TEST NEXT LINE
9074                                        ;************************ TEST 17 *******************************
(1)                                         ;* THIS TEST VERIFIES THAT THE DEVICE DOES NOT INTERRUPT
(1)                                         ;*WHILE THE PROCESSOR STATUS DOES NOT ALLOW INTERRUPTS
(1)                                         ;*BUT WILL INTERRUPT IF THE PROCESSOR STATUS
(1)                                         ;*ALLOWS INTERRUPTS.
(3)                                 ;:*  TEST 17
(6)                                 ;:************************************************************************
(5)  015076  000004                 TST17:  SCOPE
(5)
(3)  015100  012737  000017  001246        MOV     #17,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
(3)  015106  012737  015472  001362        MOV     #TST20,NEXT     ;POINT TO THE START OF THE NEXT TEST
(1)  015114  104417                        DCLASM                  ;SET DCLR IN CSR AND SET MAINT BIT
(1)                                                                 ;IF NECESSARY (INTERNAL MODE)
(1)  015116  104421                        LPRSET                  ;SET UP LPR REGISTER
(1)  015120  005037  001374                CLR     SAVLIN          ;INIT LINE INDIC. FOR ERROR
(1)  015124  105037  001425                CLRB    DONFLG          ;INIT TCR BIT HANDLER FLAG
(1)  015130  113777  001366  164666        MOVB    LINE,@DZVTCR    ;SET ALL VALID TCR BITS
(1)  015136  106427  000200                MTPS    #MASK           ;SET CPU STATUS TO DZV11 PRIO,
(1)  015142  012777  000200  164672        MOV     #MASK,@DZVRIS   ;SET RECEIVER STATUS
(1)  015150  012777  000200  164670        MOV     #MASK,@DZVTIS   ;SET TRANSMITTER STATUS
(1)  015156                         1$:
(2)  015156  012777  015244  164660        MOV     #6$,@DZVTIV     ;SET UP THE TRANSMITTER INTERRUPT VECTOR
(2)  015164  012777  015266  164646        MOV     #7$,@DZVRIV     ;SET UP THE RECEIVER INTERRUPT VECTOR
(2)  015172  012777  000200  164642        MOV     #MASK,@DZVRIS   ;SET THE INTERRUPT VECTOR STATUS
(2)  015200  012777  000200  164640        MOV     #MASK,@DZVTIS   ;SET TRANSMITTER INTERRUPT PRIORITY
(2)  015206  052777  040040  164574        BIS     #TIE!MSENAB,@DZVCSR ;ENABLE THE DEVICE
(1)  015214  005005                        CLR     R5              ;INIT DELAY COUNTER
(1)  015216  005777  164566          4$:     TST     @DZVCSR         ;TRDY SET?
(1)  015222  100003                        BPL     5$              ;IF NOT GO DO DELAY
(1)  015224  000240                        NOP                     ;WAIT FOR INTERRUPT
(1)  015226  000240                        NOP
(1)  015230  000420                        BR      8$              ;GO CLEAR TIE BIT
(1)  015232  104414                5$:     DELAY                   ;DELAY ROUTINE CALL
(1)  015234  005205                        INC     R5              ;INC DELAY COUNTER
```

```
   (1)  015236  001367                          BNE     4$                ;DELAY FINISHED?
   (1)  015240  104003                          ERROR   3                 ;*TRDY NOT SET!
   (1)  015242  000413                          BR      8$                ;GO CLEAR TIE
   (1)  015244  022626                  6$:     POP2SP                    ;REMOVE THE INTERRUPT FROM THE STACK
   (1)  015246  042777  040000  164534          BIC     #TIE,@DZVCSR      ;DON'T LET ANY MORE INTERRUPTS OCCUR
   (1)  015254  105737  001425                  TSTB    DONFLG            ;PROCESSOR ALLOWING INTER?
   (1)  015260  001013                          BNE     10$               ;IF YES NO ERROR
   (1)  015262  104010                          ERROR   10                ;IF NOT PRINT ERROR
   (1)  015264  000413                          BR      9$                ;RETURN TO THE NORMAL FLOW
   (1)  015266  104012                  7$:     ERROR   12                ;*RECEIVER SHOULD NOT INTERRUPT
   (1)  015270  022626                          POP2SP                    ;POP FOR FAKE RTI
   (1)  015272  042777  040000  164510  8$:     BIC     #TIE,@DZVCSR      ;RESET TRANSMITTER INTERRUPT ENABLE
   (1)  015300  105737  001425                  TSTB    DONFLG            ;INTERRUPTS ENABLED?
   (1)  015304  001403                          BEQ     9$                ;IF NOT GET OUT
   (1)  015306  104007                          ERROR   7                 ;IF YES TRANS FAILED TO INTER.
   (1)  015310  106427  000000          10$:    MTPS    #CLEAR            ;ALLOW INTERRUPTS
   (1)  015314                          9$:
   (2)  015314  012777  015420  164522          MOV     #11$,@DZVTIV      ;SET UP THE TRANSMITTER INTERRUPT VECTOR
   (2)  015322  012777  015424  164510          MOV     #12$,@DZVRIV      ;SET UP THE RECEIVER INTERRUPT VECTOR
   (2)  015330  012777  000200  164504          MOV     #MASK,@DZVRIS     ;SET THE INTERRUPT VECTOR STATUS
   (2)  015336  012777  000200  164502          MOV     #MASK,@DZVTIS     ;SET TRANSMITTER INTERRUPT PRIORITY
   (2)  015344  052777  000140  164436          BIS     #RIE!MSENAB,@DZVCSR ;ENABLE THE DEVICE
   (1)  015352  113777  001426  164454          MOVB    TDO,@DZVTDR       ;LOAD BUFFER WITH ANY CHAR.
   (1)  015360  005005                          CLR     R5                ;INIT DELAY ACCUMULATOR
   (1)  015362  105777  164422          13$:    TSTB    @DZVCSR           ;REC. DONE?
   (1)  015366  100003                          BPL     14$               ;IF NOT DELAY
   (1)  015370  000240                          NOP                       ;WAIT FOR INTERRUPT
   (1)  015372  000240                          NOP
   (1)  015374  000404                          BR      18$
   (1)  015376  104414                  14$:    DELAY                     ;DELAY FOR INTERRUPT
   (1)  015400  005205                          INC     R5                ;INCREMENT DELAY COUNTER
   (1)  015402  001367                          BNE     13$               ;DELAY FINISHED?
   (1)  015404  104004                          ERROR   4                 ;*NO RX DONE! (NOT SET)
   (1)  015406  105737  001425          18$:    TSTB    DONFLG            ;PROCESSOR ALLOWING INTERRUPTS?
   (1)  015412  001411                          BEQ     15$               ;IF NOT DON'T PRINT ERROR
   (1)  015414  104011                          ERROR   11                ;RECEIVER FAILED TO INTERRUPT
   (1)  015416  000407                          BR      15$               ;CONTINUE TEST
   (1)  015420  104010                  11$:    ERROR   10                ;TRANSMITTER SHOULD NOT INTER.
   (1)  015422  000404                          BR      16$               ;CONT TEST
   (1)  015424  105737  001425          12$:    TSTB    DONFLG            ;PROCESSOR ALLOWING INTERRUPTS?
   (1)  015430  001001                          BNE     16$               ;IF YES DON'T PRINT ERROR
   (1)  015432  104012                          ERROR   12                ;*RECEIVER SHOULD NOT INTERRUPT
   (1)  015434  022626                  16$:    POP2SP                    ;POP FOR FAKE RTI
   (1)  015436  042777  040100  164344  15$:    BIC     #RIE!TIE,@DZVCSR          ;CLEAR INTERRUPTS
   (1)  015444  105737  001425                  TSTB    DONFLG            ;SECOND TIME THROUGH?
   (1)  015450  001005                          BNE     17$               ;IF YES LEAVE TEST
   (1)  015452  105237  001425                  INCB    DONFLG            ;IF NO INDICATE SECOND TEST PASS
   (1)  015456  106427  000000                  MTPS    #CLEAR            ;ALLOW INTERRUPTS
   (1)  015462  000635                          BR      1$                ;RESTART TEST
   (1)  015464  106427  000200          17$:    MTPS    #MASK             ;DON'T ALLOW INTERRUPTS
   (1)  015470  104413                          DEVICE.CLR                ;CLEAR DEVICE, LEAVE TEST
 9075
 9076                                           ;************************** TEST 20 *********************************
 9077                                           ;*THIS TEST VERIFIES THAT THE RECEIVER WILL
 9078                                           ;*INTERRUPT BEFORE THE TRANSMITTER EVEN
 9079                                           ;*THOUGH THE TRANSMITTER WAS ENABLED
```

```
                                        ;*FIRST.  SET PS TO HIGH (MASK INTERRUPTS);
                                        ;*GET RDONE AND TRDY TO SET;
                                        ;*SET TX IE AND RX IE;
                                        ;*CLEAR PS AND EXPECT RX TO INTERRUPT FIRST
                                ;:*  TEST 20
                                ;;*****************************************************************
 (4) 015472  000004             TST20:  SCOPE
 (4)
 (2) 015474  012737  000020  001246      MOV     #20,$TSTNM      ;LOAD THE NUMBER OF THIS TEST
 (1) 015502  012737  004154  001362      MOV     #$EOP,NEXT      ;POINT TO THE END-OF-PASS HANDLER
9086 015510  104417                     DCLASM                  ;SET DCLR IN CSR AND MNTFLG
9087 015512  104421                     LPRSET                  ;LOAD PAR REGISTER FOR ALL LINES
9088 015514  005037  001374             CLR     SAVLIN          ;INIT. ERROR LINE INDIC.
9089 015520  012777  015730  164312     MOV     #8$,@DZVRIV     ;SETUP INTERRUPT STUFF
9090 015526  012777  000200  164306     MOV     #MASK,@DZVRIS   ;
9091 015534  012777  016016  164302     MOV     #12$,@DZVTIV    ;
9092 015542  012777  000200  164276     MOV     #MASK,@DZVTIS   ;
9093 015550  052777  000040  164232     BIS     #MSENAB,@DZVCSR
9094 015556  012702  000001             MOV     #1,R2           ;LINE POINTER
9095 015562  030237  001366         3$: BIT     R2,LINE         ;VALID LINE ?
9096 015566  001515                     BEQ     14$             ;IF NOT GO TO NEXT LINE
9097 015570  106427  000200         4$: MTPS    #MASK
9098 015574  110277  164224             MOVB    R2,@DZVTCR      ;SET TCR BIT
9099 015600  005777  164210             TST     @DZVRBUF        ;VALID DATA?
9100 015604  100001                     BPL     .+4             ;IT BETTER NOT BE SET
9101 015606  104017                     ERROR   17              ;DATA VALID SHOULD NOT BE SET
9102 015610  105777  164174         5$: TSTB    @DZVCSR         ;RECEIVER DONE ?
9103 015614  100001                     BPL     .+4
9104 015616  104020                     ERROR   20              ;RECEIVER DONE BIT SHOULD NOT BE SET
9105 015620  005005                     CLR     R5
9106 015622  005004                     CLR     R4
9107 015624  005777  164160        99$: TST     @DZVCSR         ;WAIT FOR TRDY
9108 015630  100404                     BMI     100$            ;BR IF READY
9109 015632  104414                     DELAY                   ;STALL TIME
9110 015634  005204                     INC     R4              ;
9111 015636  001372                     BNE     99$
9112 015640  104003                     ERROR   3               ;TRDY FAILED TO SET
9113 015642  105077  164166        100$: CLRB    @DZVTDR         ;SEND A ZERO CHARACTER
9114 015646  005004                     CLR     R4
9115 015650  105777  164134         6$: TSTB    @DZVCSR         ;IS RDONE SET?
9116 015654  100404                     BMI     7$
9117 015656  104414                     DELAY
9118 015660  005204                     INC     R4
9119 015662  001372                     BNE     6$
9120 015664  104004                     ERROR   4               ;*RDONE FAILED TO SET!
9121 015666  005777  164116         7$: TST     @DZVCSR         ;TRANS DONE BIT = 1 ?
9122 015672  100401                     BMI     .+4             ;YES
9123 015674  104003                     ERROR   3               ;*NO   TRANS DONE FAILED TO SET
9124                                    ;NOW THAT BOTH TRANSMITTER AND RECEIVER DONE BIT =1
9125                                    ;SET INTERRUPT ENABLES
9126 015676  052777  040000  164104     BIS     #TIE,@DZVCSR
9127 015704  052777  000100  164076     BIS     #RIE,@DZVCSR
9128 015712  106427  000000             MTPS    #CLEAR          ;ALLOW THE INTERRUPTS
9129 015716  000240                     NOP
9130 015720  000240                     NOP
9131 015722  104007                     ERROR   7               ;*TRANSMITTER FAILED TO INTERRUPT
```

```
 9132  015724  104011                          ERROR   11              ;*RECEIVER FAILED TO INTERRUPT
 9133  015726  000435                          BR      14$             ;GET OUT
 9134
 9135                                          ;RECEIVER INTERRUPT ROUTINE
 9136  015730  017704  164060          8$:     MOV     @DZVRBUF,R4     ;ACTUAL
 9137  015734  010403                          MOV     R4,R3
 9138  015736  000303                          SWAB    R3
 9139  015740  042703  177770                  BIC     #^C<7>,R3       ;STRIP JUNK
 9140  015744  005737  001372                  TST     MODE            ;IS THIS TEST IN STAGGERED MODE?
   (1) 015750  100006                          BPL     11$             ;IF NOT, SKIP STAGGERED SETUP
   (1)
   (1)                                          ;WE MUST NOW INVERT THE LAST BIT OF THE LINE NUMBER
   (1)
   (1) 015752  006203                          ASR     R3              ;GET THE LAST BIT INTO THE CARRY BIT
   (1) 015754  103402                          BCS     9$              ;IF IT IS SET, GO CLEAR IT
   (1) 015756  000261                          SEC                     ;IF IT IS CLEAR SET IT HERE
   (1) 015760  000401                          BR      10$             ;SKIP THE CLEARING
   (1) 015762  000241                  9$:     CLC                     ;CLEAR THE CARRY BIT (INVERSION OF LINE PARITY)
   (1) 015764  006103                  10$:    ROL     R3              ;GET THE NEW BIT BACK INTO R3
 9141  015766  020337  001374          11$:    CMP     R3,SAVLIN       ;IS THIS A VALID LINE
 9142  015772  001401                          BEQ     .+4             ;YES
 9143  015774  104015                          ERROR   15              ;*INVALID LINE
 9144  015776  042704  177400                  BIC     #^C<377>,R4     ;STRIP JUNK
 9145  016002  120504                          CMPB    R5,R4           ;DATA COMPARE ?
 9146  016004  001401                          BEQ     .+4             ;YES
 9147  016006  104005                          ERROR   5               ;*DATA DOES NOT COMPARE
 9148  016010  040277  164010                  BIC     R2,@DZVTCR      ;CLEAR TCR BIT
 9149  016014  000401                          BR      13$             ;GO GET OUT OF INTERRUPT MODE
 9150                                          ;TRANSMITTER INTERRUPT SVC ROUTINE
 9151  016016  104011                  12$:    ERROR   11              ;THE RECEIVER INTERRUPT FAILED
 9152                                                                  ;TO OVERRIDE THE TRANSMITTER
 9153  016020  022626                  13$:    POP2SP                  ;REMOVE THE INTERRUPT VECTOR FROM THE STACK
 9154  016022  005237  001374          14$:    INC     SAVLIN          ;ADJUST FOR NEXT LINE
 9155  016026  104420                          SHIFT                   ;GET THE NEXT POINTER. IF DONE, ADVANCE
 9156  016030  000137  015562                  JMP     3$              ;OTHERWISE GO DO THE NEXT LINE
```

```
                                        ;ERROR TABLE
016034  000000          .ERRTAB:        0       ;ERROR 0
016036  000000                          0
016040  000000                          0

016042  016202                          EM1     ;ERROR
016044  017020                          DH1
016046  017140                          DT1

016050  016255                          EM2     ;ERROR 2
016052  017044                          DH2
016054  017152                          DT2

016056  016303                          EM3     ;ERROR 3
016060  017077                          DH3
016062  017170                          DT3

016064  016342                          EM4     ;ERROR 4
016066  017077                          DH3
016070  017170                          DT3

016072  016371                          EM5     ;ERROR 5
016074  017111                          DH4
016076  017176                          DT4

016100  016420                          EM6     ;ERROR 6
016102  017111                          DH4
016104  017176                          DT4

016106  016457                          EM7     ;ERROR 7
016110  017077                          DH3
016112  017170                          DT3

016114  016520                          EM10    ;ERROR 10
016116  017077                          DH3
016120  017170                          DT3

016122  016562                          EM11    ;ERROR 11
016124  017077                          DH3
016126  017170                          DT3

016130  016620                          EM12    ;ERROR 12
016132  017077                          DH3
016134  017170                          DT3

016136  000000                          0
016140  000000                          0
016142  000000                          0

016144  000000                          0
016146  000000                          0
016150  000000                          0

016152  016657                          EM15    ;ERROR 15
016154  000000                          0
016156  000000                          0
```

```
 9214
 9215  016160  000000                                  0
 9216  016162  000000                                  0
 9217  016164  000000                                  0
 9218
 9219  016166  016721                                  EM17    ;ERROR 17
 9220  016170  017077                                  DH3
 9221  016172  017170                                  DT3
 9222
 9223  016174  016757                                  EM20
 9224  016176  017077                                  DH3
 9225  016200  017170                                  DT3
```

```
                                                ;ERROR MESSAGES
016202 047200 020117 052502 EM1:    .ASCIZ  <200>/NO BUS REPLY RESPONSE FROM DZV11 REGISTER/
016255    200 042522 044507 EM2:    .ASCIZ  <200>?REGISTER R/W FAILURE?
016303    200 051124 047101 EM3:    .ASCIZ  <200>/TRANSMIT READY (TRDY) NOT SET/
016342 051200 041505 044505 EM4:    .ASCIZ  <200>/RECEIVER DONE NOT SET/
016371    200 040504 040524 EM5:    .ASCIZ  <200>/DATA COMPARISON ERROR/
016420 042200 053132 030461 EM6:    .ASCIZ  <200>/DZV11 *RECEIVER BUFFER* ERROR/
016457    200 051124 047101 EM7:    .ASCIZ  <200>/TRANSMITTER FAILED TO INTERRUPT/
016520 052600 042516 050130 EM10:   .ASCIZ  <200>/UNEXPECTED TRANSMITTER INTERRUPT/
016562 051200 041505 044505 EM11:   .ASCIZ  <200>/RECEIVER FAILED TO INTERRUPT/
016620 052600 042516 050130 EM12:   .ASCIZ  <200>/UNEXPECTED RECEIVER INTERRUPT/
016657    200 041501 044524 EM15:   .ASCIZ  <200>/ACTION DETECTED ON INVALID LINE./
016721    200 040504 040524 EM17:   .ASCIZ  <200>/DATA VALID SHOULD NOT BE SET/
016757    200 042522 042503 EM20:   .ASCIZ  <200>/RECEIVER DONE SHOULD NOT BE SET/

017020 052200 040522 020120 DH1:    .ASCIZ  <200>/TRAP PC  DZV11 REG/
017044 042600 050130 041505 DH2:    .ASCIZ  <200>/EXPECTED  FOUND  REGISTER/
017077    200 044514 042516 DH3:    .ASCIZ  <200>/LINE NO./
017111    200 054105 042520 DH4:    .ASCIZ  <200>/EXPECTED  FOUND  LINE/

                            .EVEN
                                                ;DATA TABLES FOR ERROR MESSAGES
017140 000002               DT1:    2
017142    006     003               .BYTE   6,3
017144 001330                       $REG1
017146    006     001               .BYTE   6,1
017150 001326                       $REG0

017152 000003               DT2:    3
017154    006     004               .BYTE   6,4
017156 001340                       $REG5
017160    006     001               .BYTE   6,1
017162 001336                       $REG4
017164    006     001               .BYTE   6,1
017166 001326                       $REG0

017170 000001               DT3:    1
017172    003     001               .BYTE   3,1
017174 001374                       SAVLIN

017176 000003               DT4:    3
017200    006     004               .BYTE   6,4
017202 001340                       $REG5
017204    006     001               .BYTE   6,1
017206 001336                       $REG4
017210    003     001               .BYTE   3,1
017212 001374                       SAVLIN

                                                ;TABLE OF DELAY TIMES FOR INDIVIDUAL BAUD RATES
                                                ;----------------------------------------------

017214 002450               DLYTBL: 2450                    ;TIME FOR   50 BAUD
017216 001560                       1560                    ;TIME FOR   75 BAUD
017220 001120                       1120                    ;TIME FOR  110 BAUD
017222 000750                        750                    ;TIME FOR  134 BAUD
017224 000660                        660                    ;TIME FOR  150 BAUD
```

```
 9296  017226  000330                          330                     ;TIME FOR  300 BAUD
 9297  017230  000150                          150                     ;TIME FOR  600 BAUD
 9298  017232  000060                           60                     ;TIME FOR 1200 BAUD
 9299  017234  000040                           40                     ;TIME FOR 1800 BAUD
 9300  017236  000030                           30                     ;TIME FOR 2000 BAUD
 9301  017240  000020                           20                     ;TIME FOR 2400 BAUD
 9302  017242  000010                           10                     ;TIME FOR 3600 BAUD
 9303  017244  000001                            1                     ;TIME FOR 4800 BAUD
 9304  017246  000001                            1                     ;TIME FOR 7200 BAUD
 9305  017250  000001                            1                     ;TIME FOR 9600 BAUD
 9306  017252  000001                            1                     ;TIME OF DELAY FOR 19200 BAUD
 9307
 9308                                          ;DELAYS WERE COMPUTED TO ALLOW MAXIMUM TIME AT EACH BAUD RATE
 9309                                          ;FOR ALL TESTS TO FUNCTION CORRECTLY ON A LSI11.
```

```
 9392                                   ;
 9393                                   ; INIT $BASE AND $VECT1 AND TWEAK THE "$GETPAR" CALLING
 9394                                   ; SEQUENCE TO ACCEPT THE VALID FALCON RANGE.
 9395                                   ;
 9396  017254  023727  001174  160010  FALCINI: CMP    $BASE,#ABASE    ; IS $BASE VIRGIN ??            ;;GPA
 9397  017262  001003                          BNE    1$              ; SKIP NEXT IF NOT              ;;GPA
 9398  017264  012737  174040  001174          MOV    #174040,$BASE   ; YES, SET ENGINEERING DEFAULT  ;;GPA
 9399  017272  023727  001170  000300  1$:     CMP    $VECT1,#AVECT1  ; IS $VECT1 VIRGIN ??          ;;GPA
 9400  017300  001003                          BNE    2$              ; SKIP NEXT IF NOT              ;;GPA
 9401  017302  012737  000370  001170          MOV    #370,$VECT1     ; YES, SET ENGINEERING DEFAULT  ;;GPA
 9402  017310  012737  017354  002370  2$:     MOV    #3$,GETCSR+2    ; SUBSTITUE CSR TEXT...         ;;GPA
 9403  017316  012737  174000  002374          MOV    #174000,GETCSR+6                                ;;GPA
 9404  017324  012737  177770  002376          MOV    #177770,GETCSR+10 ;...AND VALID RANGE.          ;;GPA
 9405  017332  012737  017416  002414          MOV    #4$,GETVEC+2    ; SUBSTITUTE VECTOR TEXT...     ;;GPA
 9406  017340  005037  002420                  CLR    GETVEC+6                                        ;;GPA
 9407  017344  012737  000370  002422          MOV    #370,GETVEC+10  ;...AND VALID RANGE.            ;;GPA
 9408  017352  000207                          RETURN                 ; RETURN TO CALLER.             ;;GPA
 9409
 9410  017354  030600  052123  041440  3$:     .ASCIZ  <200>'1ST CSR ADDRESS (174000:177770) '        ;;GPA
       017362  051123  040440  042104
       017370  042522  051523  024040
       017376  033461  030064  030060
       017404  030472  033467  033467
       017412  024460  000040
 9411  017416  030600  052123  053040  4$:     .ASCIZ  <200>'1ST VECTOR ADDRESS (000:370)    '        ;;GPA
       017424  041505  047524  020122
       017432  042101  051104  051505
       017440  020123  030050  030060
       017446  031472  030067  020051
       017454  020040  000040
 9412                                          .EVEN                                                   ;;GPA
 9413                                   ;
 9426                                   ;
 9427                                   ;THE FOLLOWING .INIT CALL WAS ADDED TO INIT BRKVEC AND LKVEC
 9428          017460                   POINT=.                 ;SAVE POINTER
  (1)          000100                   .=100
  (1)  000100  017460                   $CLKVEC                 ;LKVEC  HANDLER
  (1)  000102  000300                   300                     ;INTERRUPT HANDLER PRI
  (1)          000140                   .=140                   ;BRKVEC
  (1)  000140  170000                   170000                  ;ODT START ADDRESS
  (1)  000142  000300                   300                     ;PRIORITY
  (1)          017460                   .=POINT                 ;RESTORE POINTER
  (1)  017460  104402  017466           $CLKVEC:        TYPE,CLKMES
  (1)  017464  000000                                   HALT
  (1)  017466  005015  045514  042526  CLKMES:  .ASCIZ <15><12>/LKVEC INTERRUPT - DISCONNECT LTC /
  (1)  017474  020103  047111  042524
  (1)  017502  051122  050125  020124
  (1)  017510  020055  044504  041523
  (1)  017516  047117  042516  052103
  (1)  017524  046040  041524  000040
 9429  017532  000001                   KXTFLAG:1       ;TO INDICATE THE PROCESSOR IS FALCON
 9430          000001                   .END
```

```
ABASE = 160010           8360#   8703    9396
ACDW1 = 000017           8365#   8703
ACDW2 = 000000           8703
ACPUOP= 000000           8703
ACTIVE  001420           8703#*  8705*
ADDW0 = 017470           8363#   8703
ADDW1 = 017470           8363#   8703
ADDW10= 017470           8363#   8703
ADDW11= 017470           8363#   8703
ADDW12= 017470           8363#   8703
ADDW13= 017470           8363#   8703
ADDW14= 017470           8363#   8703
ADDW15= 017470           8363#   8703
ADDW2 = 017470           8363#   8703
ADDW3 = 017470           8363#   8703
ADDW4 = 017470           8363#   8703
ADDW5 = 017470           8363#   8703
ADDW6 = 017470           8363#   8703
ADDW7 = 017470           8363#   8703
ADDW8 = 017470           8363#   8703
ADDW9 = 017470           8363#   8703
ADEVCT= 000000           8703
ADEVM = 000001           8366#   8703
ADRCNT  005751           8705#*
ADVANC= 104400           8703#   8705    8710    8784
AENV  = 000000           8703
AENVM = 000000           8703
AFATAL= 000000           8703
AMADR1= 000000           8703
AMADR2= 000000           8703
AMADR3= 000000           8703
AMADR4= 000000           8703
AMAMS1= 000000           8703
AMAMS2= 000000           8703
AMAMS3= 000000           8703
AMAMS4= 000000           8703
AMSGAD= 000000           8703
AMSGLG= 000000           8703
AMSGTY= 000000           8703
AMTYP1= 000000           8703
AMTYP2= 000000           8703
AMTYP3= 000000           8703
AMTYP4= 000000           8703
APASS = 000000           8703
APRIOR= 000000           8703
APTCSU= 000040           8705#
APTENV= 000001           8705#
APTSIZ= 000200           8705#
APTSPO= 000100           8705#
ASWREG= 000000           8703
ATESTN= 000000           8703
AUNIT = 000000           8703
AUSWR = 000000           8703
AUTO.S  011320           8703    8705#
AVECT1= 000300           8364#   8703    9399
AVECT2= 000000           8703
```

```
BINWRD  006224           8705#
BIT0  = 000001           8703#   8798
BIT00 = 000001           8703#
BIT01 = 000002           8703#
BIT02 = 000004           8703#
BIT03 = 000010           8703#
BIT04 = 000020           8703#
BIT05 = 000040           8703#
BIT06 = 000100           8703#
BIT07 = 000200           8703#
BIT08 = 000400           8703#
BIT09 = 001000           8703#
BIT1  = 000002           8703#
BIT10 = 002000           8703#   8767
BIT11 = 004000           8703#   8705    8767
BIT12 = 010000           8703#
BIT13 = 020000           8703#
BIT14 = 040000           8703#   8705
BIT15 = 100000           8703#
BIT2  = 000004           8703#
BIT3  = 000010           8703#
BIT4  = 000020           8703#   8705
BIT5  = 000040           8703#   8705
BIT6  = 000100           8703#
BIT7  = 000200           8703#   8705
BIT8  = 000400           8703#   8729
BIT9  = 001000           8703#   8729
BPTVEC= 000014           8703#
BRKVEC= 000140           8703#
BRK0  = 000400           8703#
BRK1  = 001000           8703#
BRK2  = 002000           8703#
BRK3  = 004000           8703#
BRW     004630           8703    8705#
BUFSET= 104422           8703#   8984
CHRCNT  006222           8705#*
CLEAR = 000000           8703#   9074*   9128*
CLKMES  017466           9428#
CNVRT = 104412           8703#   8705
CONVRT= 104411           8703#   8705
CORMAX  017460           9421#   9422
CO0   = 000400           8703#
CO1   = 001000           8703#
CO2   = 002000           8703#
CO3   = 004000           8703#
CR    = 000015           8703#   8705
CRLF  = 000200           8703#   8705
CSRMAP  011326           8705#
CYCLE   010464           8703    8705#
DATABP  006716           8705#*
DATAHD  006704           8705#*
DCLASM= 104417           8703#   8836    8902    8981    9047    9074    9086
DCLR  = 000020           8703#   8705    8718    8739    8751    8758    8760
DDISP = 177570           8703#
DELAY = 104414           8703#   8729    8807    8815    8824    8852    8868    8915    8943    8958    8999    9014    9061
                         9074    9109    9117
```

CROSS REFERENCE TABLE -- USER SYMBOLS


```
DEVADR  005746          8705#*
DEVICE= 104413          8703#   8705    8727    8728    8729    8737    8767    8768    8786    8824    8961    9074
DH1     017020          9164    9245#
DH2     017044          9168    9246#
DH3     017077          9172    9176    9188    9192    9196    9200    9220    9224    9247#
DH4     017111          9180    9184    9248#
DISPLA  001306          8703#*  8705*
DISPRE  000174          8703#
DLYCNT  006320          8703*   8705#
DLYTBL  017214          8703    9291#
DONFLG  001425          8703#   8839*   8856    8858*   8878*   8900*   8930    8953*   8985*   9003    9025*   9028*   9074*
DSWR  = 177570          8703#
DTR0  = 000400          8703#   8728
DTR1  = 001000          8703#   8728
DTR2  = 002000          8703#   8728
DTR3  = 004000          8703#   8728
DT1     017140          9165    9255#
DT2     017152          9169    9261#
DT3     017170          9173    9177    9189    9193    9197    9201    9221    9225    9269#
DT4     017176          9181    9185    9273#
DVALID= 100000          8703#   8767    8864    9010    9056
DZCR0   001500          8703#   8705
DZCR1   001512          8703#
DZCR10  001620          8703#
DZCR11  001632          8703#
DZCR12  001644          8703#
DZCR13  001656          8703#
DZCR14  001670          8703#
DZCR15  001702          8703#
DZCR16  001714          8703#
DZCR17  001726          8703#
DZCR2   001524          8703#
DZCR3   001536          8703#
DZCR4   001550          8703#
DZCR5   001562          8703#
DZCR6   001574          8703#
DZCR7   001606          8703#
DZVACT  001406          8703#*  8705
DZVCSR  002010          8703#   8705*   8710    8717    8727    8729    8738    8824    8842*   8847    8850    8866    8886
                        8911*   8913    8939    8964    8987*   8993    8997    9012    9052*   9059    9074*   9093*   9102
                        9107    9115    9121    9126*   9127*
DZVC0   001502          8703#   8705
DZVC1   001514          8703#
DZVC10  001622          8703#
DZVC11  001634          8703#
DZVC12  001646          8703#
DZVC13  001660          8703#
DZVC14  001672          8703#
DZVC15  001704          8703#
DZVC16  001716          8703#
DZVC17  001730          8703#
DZVC2   001526          8703#
DZVC3   001540          8703#
DZVC4   001552          8703#
DZVC5   001564          8703#
DZVC6   001576          8703#
```

```
DZVC7   001610            8703#
DZVLEV  011030            8705#
DZVLPR  002020            8703#   8705*   8767*
DZVMSR  002030            8703#   8705*   8710    8768    8787
DZVNUM  001414            8703#*  8705*
DZVRBU  002014            8703#   8705*   8710    8767    8872    8946    8968    9018    9065    9099    9136
DZVRIS  002042            8703#   8705*   9074*   9090*
DZVRIV  002040            8703#   8705*   9074*   9089*
DZVTCR  002024            8703#   8705*   8710    8728    8729*   8824*   8845*   8879*   8910*   8928*   8937*   8990*   9027*
                          9074*   9098*   9148*
DZVTDR  002034            8703#   8705*   8768*   8859*   8888*   8934*   9005*   9074*   9113*
DZVTIS  002046            8703#   8705*   9074*   9092*
DZVTIV  002044            8703#   8705*   9074*   9091*
DZV.EN  001740            8703#   8705
DZV.MA  001500            8703#   8705
EIGHT =  000030           8703#
EIGHTS=  000070           8703#
EMTVEC=  000030           8703#*
EM1     016202            9163    9231#
EM10    016520            9191    9238#
EM11    016562            9195    9239#
EM12    016620            9199    9240#
EM15    016657            9211    9241#
EM17    016721            9219    9242#
EM2     016255            9167    9232#
EM20    016757            9223    9243#
EM3     016303            9171    9233#
EM4     016342            9175    9234#
EM5     016371            9179    9235#
EM6     016420            9183    9236#
EM7     016457            9187    9237#
ERRMSG  006672            8705#*
ERRVEC=  000004           8703#   8705*
ERTABO  007046            8705#
EVEPAR=  000000           8703#
EXITER  006776            8705#
FALCIN  017254            8703*   9396#
FIVE  =  000000           8703#
FIVES =  000040           8703#
FRMERR=  020000           8703#   9056
GETCSR=  002366           8703#   9402*   9403*   9404*
GETSWR=  007110           8703*   8705#
GETVEC=  002412           8703#   9405*   9406*   9407*
HALTS   006722            8705#
HDRFLG  001423            8703#*
HDZVCS  002012            8703#   8705*   8752*   8919
HDZVLP  002022            8703#   8705*
HDZVMS  002032            8703#   8705*
HDZVRB  002016            8703#   8705*
HDZVTC  002026            8703#   8705*   8806*   8814*
HDZVTD  002036            8703#   8705*   9058*   9069*
HILIM   005744            8705#*
HT    =  000011           8703#   8705
INBUF   010360            8705#*
INIFLG  001422            8703#*  8705*
INSTER=  104404           8703#   8705
```

```
INSTR = 104403           8703#   8705
INSTR2  005544           8705#
IOTVEC= 000020           8703#   8705*
KXTFLA  017532           8703    9429#
LF    = 000012           8703#   8705
LIMITS  005672           8705#
LINE    001366           8703#   8705*   8790    8824    8843    8909    8988    9045    9074    9095
LINE0   001504           8703#*
LINE1   001516           8703#
LINE10  001624           8703#
LINE11  001636           8703#
LINE12  001650           8703#
LINE13  001662           8703#
LINE14  001674           8703#
LINE15  001706           8703#
LINE16  001720           8703#
LINE17  001732           8703#
LINE2   001530           8703#
LINE3   001542           8703#
LINE4   001554           8703#
LINE5   001566           8703#
LINE6   001600           8703#
LINE7   001612           8703#
LKVEC = 000100           8703#
LOBITS  005750           8705#*
LOCK    001364           8703#   8705*   8710*   8727*   8728*   8785*   8813*   8821*   8824*   8835*   8980*   9042*
LOLIM   005742           8705#*
LPRSET= 104421           8703#   8837    8906    8982    9050    9074    9087
LP0   = 000000           8703#
LP1   = 000001           8703#
LP2   = 000002           8703#
LP3   = 000003           8703#
MAINT = 000010           8703#   8705    8727    8740    8753
MANT0   001510           8703#   8705
MANT1   001522           8703#
MANT10  001630           8703#
MANT11  001642           8703#
MANT12  001654           8703#
MANT13  001666           8703#
MANT14  001700           8703#
MANT15  001712           8703#
MANT16  001724           8703#
MANT17  001736           8703#
MANT2   001534           8703#
MANT3   001546           8703#
MANT4   001560           8703#
MANT5   001572           8703#
MANT6   001604           8703#
MANT7   001616           8703#
MASK  = 000200           8703#*  8705    8710    9074*   9090    9092    9097*
MASTEK  007775           8705#
MBADLN  010110           8703    8705#
MCSRX   007725           8705#
MDATA   010422           8705#
MEPASS  007543           8705#
MERRPC  010055           8705#
```

```
MERRX   007752            8705#
MERR2   007603            8705#
MERR3   007652            8703    8705#
MLOCK   007676            8703    8705#
MNEW    010000            8703    8705#
MNTFLG  001424            8703#   8705*
MODE    001372            8703#   8705*   8782    8796    8861    9007    9054    9140
MPASSX  007741            8705#
MPFAIL  007500            8705#
MR      007567            8703    8705#
MSENAB= 000040            8703#   8727    8729    8740    8753    8824    8842    8911    8987    9052    9074    9093
MTITLE  001000            8703#
MTSTN   007763            8705#
MVECX   007733            8705#
NEXT    001362            8703#   8705    8710*   8716*   8727*   8728*   8729*   8736*   8767*   8768*   8781*   8824*   8835*
                          8899*   8980*   9041*   9074*   9085*
NOLIST= ****** U          8698
ODDPAR= 000200            8703#   9049
ODTST = 170000            8703#
ONESTO= 000000            8703#
OVRRUN= 040000            8703#
PAR     001370            8703#   8705*   8904    8905*   8907*   8954    9048    9049*   9051*
PARAM = 104405            8703#   8705
PARAM1  005612            8705#
PARER = 010000            8703#   9056
PARERR  005666            8705#
PARITY= 000100            8703#   9049
PARMD = 104415            8703#
PAR0    001506            8703#*
PAR1    001520            8703#
PAR10   001626            8703#
PAR11   001640            8703#
PAR12   001652            8703#
PAR13   001664            8703#
PAR14   001676            8703#
PAR15   001710            8703#
PAR16   001722            8703#
PAR17   001734            8703#
PAR2    001532            8703#
PAR3    001544            8703#
PAR4    001556            8703#
PAR5    001570            8703#
PAR6    001602            8703#
PAR7    001614            8703#
PAWCH = 104416            8703#
PIRQ  = 177772            8703#
PIRQVE= 000240            8703#
POINT = 017460            9428#
POPR0 = 012600            8703#
POP1SP= 005726            8703#
POP2SP= 022626            8703#   8705    8710    9074    9153
PR0   = 000000            8703#
PR1   = 000040            8703#
PR2   = 000100            8703#
PR3   = 000140            8703#
PR4   = 000200            8703#
```

```
PR5    = 000240          8703#
PR6    = 000300          8703#   8705
PR7    = 000340          8703#
PS     = 177776          8703#
PSW    = 177776          8703#
PUSHR0= 010046           8703#
PUSH1S= 005746           8703#
PUSH2S= 024646           8703#
PWRVEC= 000024           8703#   8705*
RCVON  = 010000          8703#   8905
RDONE  = 000200          8703#   8729
REGIST  001402           8703#
RESREG  006720           8705#
RESTAR  011024           8705#
RESVEC= 000010           8703#
RES05  = 104410          8703#   8705
RIE    = 000100          8703#   8727    8740    8753    9074    9127
RING0  = 000001          8703#
RING1  = 000002          8703#
RING2  = 000004          8703#
RING3  = 000010          8703#
RL0    = 000000          8703#
RL1    = 000400          8703#
RL2    = 001000          8703#
RL3    = 001400          8703#
RUN     001412           8703#*  8705*
SAVACT  001410           8703#*  8705*
SAVLIN  001374           8703#   8824*   8838*   8860    8880*   8901*   8950*   8966*   8970*   8983*   8991    9006    9029*
                         9043*   9053    9071*   9074*   9088*   9141    9154*   9271    9279
SAVNO   001416           8703#*  8705
SAVNUM  001415           8703#*  8705*
SAVPC   001404           8703#   8705*
SAV05  = 104407          8703#   8705
SCOP1  = 104401          8703#   8710    8727    8728    8812    8820    8824    8877    8889    9022    9070
SERV.G  007062           8705#
SETAPT  011172           8703*   8705#
SETFLG= 104406           8703#
SEVEN  = 000020          8703#
SEVENS= 000060           8703#
SHIFT  = 104420          8703#   8793    8824    8881    9030    9072    9155
SILOAL= 020000           8703#   8729
SILOEN= 010000           8703#   8727    8740
SIX    = 000010          8703#
SIXS   = 000050          8703#
SPACNT  006223           8705#
STACK  = 001120          8703#   8705
STKLMT= 177774           8703#
STOP    001446           8703#   8705
SV05    005760           8705#
SWR     001304           8703#*  8705*
SWREG   000176           8703#
SW0    = 000001          8703#
SW00   = 000001          8703#
SW01   = 000002          8703#   8705
SW02   = 000004          8703#
SW03   = 000010          8703#
```

```
SW04   = 000020           8703#
SW05   = 000040           8703#
SW06   = 000100           8703#
SW07   = 000200           8703#
SW08   = 000400           8703#   8705
SW09   = 001000           8703#   8705
SW1    = 000002           8703#
SW10   = 002000           8703#   8705
SW11   = 004000           8703#
SW12   = 010000           8703#   8705
SW13   = 020000           8703#   8705
SW14   = 040000           8703#
SW15   = 100000           8703#
SW2    = 000004           8703#
SW3    = 000010           8703#
SW4    = 000020           8703#
SW5    = 000040           8703#
SW6    = 000100           8703#
SW7    = 000200           8703#
SW8    = 000400           8703#
SW9    = 001000           8703#
S110   = 001000           8703#
S1200  = 003400           8703#
S134   = 001400           8703#
S150   = 002000           8703#
S1800  = 004000           8703#
S19200= 007400            8703#
S2000  = 004400           8703#
S2400  = 005000           8703#
S300   = 002400           8703#
S3600  = 005400           8703#
S4800  = 006000           8703#
S50    = 000000           8703#
S600   = 003000           8703#
S7200  = 006400           8703#
S75    = 000400           8703#
S9600  = 007000           8703#
TBITVE= 000014            8703#
TCR0   = 000001           8703#   8728
TCR1   = 000002           8703#   8728
TCR2   = 000004           8703#   8728
TCR3   = 000010           8703#   8728
TD0      001426           8703#   8705    9005    9009    9023*   9074
TD1      001430           8703#
TD2      001432           8703#
TD3      001434           8703#
TEIGHT   002106           8703#
TFIVE    002114           8703#
TIE    = 040000           8703#   8727    8740    9074    9126
TKVEC  = 000060           8703#
TLAST  = 015472           8705    9285#
TL0    = 000000           8703#
TL1    = 000400           8703#
TL2    = 001000           8703#
TL3    = 001400           8703#
TMTBL    002050           8703#
```

```
TPVEC = 000064           8703#
TRAPVE= 000034           8703#
TRDY  = 100000           8703#   8729    8824
TRTVEC= 000014           8703#
TR0     001436           8703#
TR1     001440           8703#
TR2     001442           8703#
TR3     001444           8703#
TSEVEN  002110           8703#
TSIX    002112           8703#
TST1    012024           8705    8710#
TST10   013160           8767    8768#
TST11   013244           8768    8781#
TST12   013440           8781    8824#
TST13   013572           8824    8835#
TST14   014062           8835    8899#
TST15   014404           8899    8980#
TST16   014674           8980    9041#
TST17   015076           9041    9074#
TST2    012214           8710    8716#
TST20   015472           9074    9085#   9285
TST21 = ****** U         9085
TST3    012260           8716    8727#
TST4    012436           8727    8728#
TST5    012642           8728    8729#
TST6    012744           8729    8736#
TST7    013074           8736    8767#
TTST    004402           8703*   8705#
TWOSTO= 000040           8703#
TYPDAT  006706           8705#
TYPE  = 104402           8703#   8705    9428
TYPMSG  006576           8705#
T110    002054           8703#
T1200   002066           8703#
T134    002056           8703#
T150    002060           8703#
T1800   002070           8703#
T2000   002072           8703#
T2400   002074           8703#
T300    002062           8703#
T3600   002076           8703#
T4800   002100           8703#
T50     002050           8703#
T600    002064           8703#
T7200   002102           8703#
T75     002052           8703#
T9600   002104           8703#
VECMAP  011634           8705#
WRDCNT  006220           8705#*
WTBS.F  006674           8705#
XBX     006464           8705#
XCSR    004340           8705#
XERR    004362           8705#
XHEAD   010062           8703    8705#
XMTCNT  001400           8703#
XMTLIN  001376           8703#
```

```
XPASS   004354            8705#
XSTATQ  010152            8703    8705#
XTSTN   007054            8705#
XVEC    004346            8705#
XX    = 160210            8703#
YY    = 000500            8703#
ZZ    = 000020            8703#
$APTHD  001446            8703#
$ASTAT= ****** U          8705
$ATYC   005204            8705#
$ATY1   005160            8705#
$ATY3   005166            8705#
$ATY4   005176            8705#
$AUTOB  001300            8703#
$BASE   001174            8703#*  8705*   9396    9398*
$BDADR  001266            8703#
$BDDAT  001272            8703#
$CDW1   001200            8703#   8705
$CDW2   001202            8703#   8705*
$CHARC  005154            8705#*
$CLKVE  017460            9428#
$CMTAG  001244            8703#
$CM1  = 000006            8703#
$CM2  = 000014            8703#
$CM3  = 000006            8703#
$CM4  = 000005            8703#
$CPUOP  001146            8703#
$CRLF   001357            8703#   8705
$DDW0   001204            8703#   8705
$DDW1   001206            8703#
$DDW10  001230            8703#
$DDW11  001232            8703#
$DDW12  001234            8703#
$DDW13  001236            8703#
$DDW14  001240            8703#
$DDW15  001242            8703#
$DDW2   001210            8703#
$DDW3   001212            8703#
$DDW4   001214            8703#
$DDW5   001216            8703#
$DDW6   001220            8703#
$DDW7   001222            8703#
$DDW8   001224            8703#
$DDW9   001226            8703#
$DEVCT  001130            8703#   8705*
$DEVM   001176            8703#   8705*
$DOAGN  004334            8705#
$E    = 000022            6862#   8710#   8716#   8727#   8728#   8729#   8736#   8767#   8768#   8781#   8824#   8835#   8899#
                          8980#   9041#   9074#   9085#
$ENDAD  004324            8703    8705#
$ENDCT  004310            8705#
$ENV    001140            8703#   8705
$ENVM   001141            8703#   8705
$EOP    004154            8705#   9085
$EOPCT  004302            8705#
$ERFLG  001247            8703#*  8705*
```

```
$ERMAX  001261           8703#   8705
$ERROR  006434           8703    8705#
$ERRPC  001262           8703#*  8705*
$ERRTB  001362           8703#
$ERTTL  001256           8703#*  8705*
$ETABL  001140           8703#
$ETEND  001244           8703#
$FATAL  001122           8703#   8705*
$FFLG   005424           8705#*
$FILLC  001322           8703#   8705
$FILLS  001321           8703#   8705
$FLIP = 177777           5676#   8710#   8711#   8715#   8727#   8728#   8729#   8730#   8735#   8767#   8768#   8770#   8779#
                         8824#   8825#   8834#   8892#   8898#   8974#   8979#   9034#   9040#   9074#   9076#   9084#
$GDADR  001264           8703#
$GDDAT  001270           8703#
$GET42  004314           8705#
$HD   = 000001           8703
$HIBTS  001446           8703#
$ICNT   001250           8703#   8705*
$ILLUP  007472           8705#
$INTAG  001301           8703#
$ITEMB  001260           8703#   8705*
$LF     001360           8703#   8705
$LFLG   005423           8705#*
$LPADR  001252           8703#*  8705*
$LPERR  001254           8703#
$MADR1  001152           8703#
$MADR2  001156           8703#
$MADR3  001162           8703#
$MADR4  001166           8703#
$MAIL   001120           8703#   8705
$MAMS1  001150           8703#
$MAMS2  001154           8703#
$MAMS3  001160           8703#
$MAMS4  001164           8703#
$MBADR  001450           8703#
$MFLG   005422           8705#*
$MSGAD  001134           8703#   8705*
$MSGLG  001136           8703#   8705*
$MSGTY  001120           8703#   8705*
$MTYP1  001151           8703#
$MTYP2  001155           8703#
$MTYP3  001161           8703#
$MTYP4  001165           8703#
$MXCNT  004632           8705#
$N    = 000020           6861#   8710#   8711    8716#   8727#   8728#   8729#   8730    8736#   8767#   8768#   8770    8781#
                         8824#   8825    8835#   8892    8899#   8974    8980#   9034    9041#   9074#   9076    9085#   9282#
                         9283
$NULL   001320           8703#   8705
$NWTST= 000000           8710#   8716#   8727#   8728#   8729#   8736#   8767#   8768#   8781#   8824#   8835#   8899#   8980#
                         9041#   9074#   9085#
$OVER   004570           8705#
$PASS   001126           8703#*  8705*
$PASTM  001454           8703#
$PWRAD  007466           8705#
$PWRDN  007326           8703    8705#
```

```
$PWRMG  007462          8705#
$PWRUP  007400          8705#
$QUES   001356          8703#   8705
$REGAD  001324          8703#
$REG0   001326          8703#   8705*   9259    9267
$REG1   001330          8703#   8705*   9257
$REG2   001332          8703#   8705*
$REG3   001334          8703#   8705*
$REG4   001336          8703#   8705*   9265    9277
$REG5   001340          8703#   8705*   9263    9275
$RTNAD  004336          8705#
$SAVR6  007476          8705#*
$SCOPE  004370          8705#
$SETUP= 000000          8705
$SVLAD  004552          8705#
$SVPC = 000040          8703#
$SWR  = 164000          5683#   8703    8705    8710    8716    8727    8728    8729    8736    8767    8768    8781    8824
                        8835    8899    8980    9041    9074    9085
$SWREG  001142          8703#   8705
$SWRMK= 000000          8705
$TESTN  001124          8703#   8705*
$TIMES  001354          8703#   8705*
$TKB    001312          8703#   8705
$TKS    001310          8703#   8705
$TMP0   001342          8703#
$TMP1   001344          8703#*  8705
$TMP2   001346          8703#*  8705
$TMP3   001350          8703#
$TMP4   001352          8703#
$TN   = 000021          8703#   8710#   8716#   8727#   8728#   8729#   8736#   8767#   8768#   8781#   8824#   8835#   8899#
                        8980#   9041#   9074#   9085#
$TPB    001316          8703#   8705*
$TPFLG  001323          8703#   8705
$TPS    001314          8703#   8705
$TSTM   001452          8703#
$TSTNM  001246          8703#*  8705*   8710*   8716*   8727*   8728*   8729*   8736*   8767*   8768*   8781*   8824*   8835*
                        8899*   8980*   9041*   9074*   9085*
$TYPE   004676          8705#
$TYPEC  005110          8705#
$TYPEX  005156          8705#
$UNIT   001132          8703#
$UNITM  001456          8703#
$USWR   001144          8703#
$VECT1  001170          8703#*  8705*   9399    9401*
$VECT2  001172          8703#
$XTSTR  004430          8705#
$Y    = 000023          8703#
$$GET4= 000000          8705#
$40CAT= ****** U        8705
.     = 017534          8703#   8705#   9100    9103    9122    9142    9146    9428#
.ADVAN  006322          8703    8705#
.BEGIN  004060          8703#
.BUFSE  006412          8703    8705#
.CNVRT  006050          8703    8705#
.CONVR  006044          8703    8705#
.DCLAS  006270          8703    8705#
```

```
.DELAY  006302            8703    8705#
.DEVIC  006250            8703    8705#
.ERRTA  016034            8705    9159#
.INSTE  005532            8703    8705#
.INSTR  005426            8703    8705#
.INST1  005446            8705#
.LPRSE  006352            8703    8705#
.MSG    005450            8705#*
.PARAM  005552            8703    8705#
.PARMD  011170            8703    8705#
.PAWCH  010304            8703    8705#
.RES05  006012            8703    8705#
.SAV05  005752            8703    8705#
.SCOPE  004370            8703    8705#
.SCOP1  004634            8703    8705#
.SETFL  010164            8703    8705#
.SHIFT  006334            8703    8705#
.START  002116            8703#
.TRPSR  006226            8703    8705#
.TRPTA  001742            8703#   8705
.TYPE   004660            8703    8705#
.$ASTA= ****** U          8705
.$X   = 001446            8703#
```

```
COMMEN  1566#  8703#
ENDCOM  1578#  8703#
ERROR   8703#  8710  8725  8727  8728  8729  8744  8750  8757  8765  8767  8768  8811  8819  8824
        8849   8855  8871  8875  8918  8941  8951  8967  8971  8995  9002  9017  9021  9064  9068
        9074   9101  9104  9112  9120  9123  9131  9132  9143  9147  9151
ESCAPE  1698#  8703#
GETPRI  1312#  8703#
GETSWR  1771#  8703#
MULT    4484#  8703#
NEWTST  1626#  8703#  8710  8716  8727  8728  8729  8736  8767  8768  8781  8824  8835  8899  8980
        9041   9074  9085
PASEND  6892#  8705
POP     2153#  8703#  8705
PRGEND  7939#  8705
PRGFRT  7039#  8703
PUSH    2145#  8703#  8705
REPORT  5463#  5682#  8703#
SC      6832#  8705
SCOPE   8703#  8705  8710  8716  8727  8728  8729  8736  8767  8768  8781  8824  8835  8899  8980
        9041   9074  9085
SC1     6841#  8705
SETPRI  1279#  8703#
SETUP   1337#  8703#
SKIP    1733#  8703#
SLASH   1517#  8703#
SPACE   8703#
STARS   1485#  8703#  8705  8710  8716  8727  8728  8729  8736  8767  8768  8781  8824  8835  8899
        8980   9041  9074  9085
SWRSU   1453#  8703#
TYPBIN  2088#  8703#
TYPDEC  2058#  8703#
TYPNAM  1826#  8703#
TYPNUM  2025#  8703#
TYPOCS  1978#  8703#
TYPOCT  1941#  8703#
TYPTXT  1894#  8703#
$BUFFE  6970#  8705
$CYCLE  7619#  8705
$EOP    6912#  8705
$GETFL  6776#  8703
$GETPA  6766#  8703  8705
$HEADE  6527#  8703
$INTSE  7016#  9074
$JUNK   7002#  8703
$LINEU  8584#
$LVLTS  8622#  9074
$MRESE  6757#
$MRR    8517#  8729
$MRRW   8467#  8727
$MRWD   8597#  8767  8768
$MSG    6937#  8705
$SCOPE  6850#  8705
$SETFL  6782#  8705
$STAG   7023#  8861  9007  9054  9140
$STAGF  7010#
$TCR    8410#  8728
```

```
$TLINE   8548#   8824
$TRPDE   6552#   8703
$TSTN    6864#   8710    8716    8727    8728    8729    8736    8767    8768    8781    8824    8835    8899    8980    9041
          9074   9085
$UNIBU   8368#   8710
$VARIA   6564#   8703
$XZ      7921#   8710    8711    8715    8727    8728    8729    8730    8735    8767    8768    8770    8779    8824    8825
          8834   8892    8898    8974    8979    9034    9040    9074    9076    9084
$$CMRE   8703#
$$CMTM   8703#
$$ESCA   1711#   8703#
$$NEWT   1662#   8703#   8710    8716    8727    8728    8729    8736    8767    8768    8781    8824    8835    8899    8980
          9041   9074    9085
$$SKIP   1746#   8703#
.EQUAT    189#   5681#   8703
.HEADE     61#   5680#   8703
.INIT    5658#   8703#   9428
.SETUP   1213#   5680#
.SWRHI    104#
.$ACT1   5064#   5682#   8703
.$APTB   5109#   5682#   8703#
.$APTH   5370#   5682#   8703
.$APTY   5547#   5682#   8705
.$ASTA   5417#
.$CATC    932#   5680#
.$CMTA   1047#   8703#
.$DB2D   4686#
.$DB2O   4812#
.$DIV    4587#
.$EOP    2214#   5680#   8705
.$ERRO   2700#   5681#
.$ERRT   2896#
.$MULT   4523#
.$POWE   4229#   5681#   8705
.$RAND   4307#
.$RDDE   3891#
.$RDOC   3797#
.$READ   3395#
.$R2AZ   4958#
.$SAVE   3969#
.$SB2D   4771#
.$SB2O   4874#
.$SCOP   2454#   5681#   8705
.$SIZE   4361#
.$SUPR   4913#
.$TRAP   4073#   5681#
.$TYPB   3287#
.$TYPD   3209#
.$TYPE   2985#   5680#   8705
.$TYPO   3112#
.$40CA    972#

. ABS.  017534      000
```

```
 ERRORS DETECTED:  0

 CNDZAA,CNDZAA/CR/NL:TOC=CNMAC2.SML,CNDZAA.P11
 RUN-TIME: 18 19 1 SECONDS
 RUN-TIME RATIO: 133/39=3.3
 CORE USED:  50K  (100 PAGES)
```