NOAA Technical Memorandum ERL RFC-2

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

RECORD KEEPING ON AIRCRAFT INSTRUMENTS

Heinz H. Grote

Research Facilities Center
Miami, Florida
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Record Keeping on Aircraft Instruments

Records on instruments, their use, calibration and repair, have to be properly maintained to evaluate their performance and to help in keeping them in best condition. This requires that a conscientious person is given enough opportunity, time and simple means to keep all information current and to retrieve required data with ease.

The basis for the use of an instrument is its operation manual which should be pertinent and up-to-date. Changes made after the purchase should be documented, and examples of the installation should be given in the form of pictures and drawings.

A record should be kept of the purchase date and order number, the type designation and the serial number as well as price.

Much information is easiest kept in paper form. It should be stored so that the information on all instruments is together and can easily be accessed. Care has to be taken that no documents are removed; or if something is borrowed by an authorized person, that a record is kept current of where the documents are.

It cannot be emphasized enough that the value of a record keeping system depends only to a small part on the equipment but is mainly determined by the constant effort of the operator to keep the records current; one main rule is that no instrument is removed from the aircraft, changed, sent to repair or maintenance and installed on the aircraft without the record keeper signing off on a status sheet.

Frequently accessed information should be stored, updated and retrieved by computer. This is mainly information on status, calibration and repair.

No special requirements are placed on the central processor. Many microprocessors can already fill the need for computational power. A keyboard, CRT readout, printer and cassette tape recorder should be connected. The main burden is carried by the storage device. It has to keep the storage and retrieval programs, a directory, and a large amount of data.

Since the computer stores only bits of ones and zeroes, the first question arises in the translation from names or numbers by which the operator knows the instruments to bits. A convenient way would be to use the name of the instrument as it is referred to. The computer needs at least five bits to represent a letter.

space	00000
A	00001
B	00010
C	00011
'	'
'	'
'	'
Z	11010

Five characters are left unspecified at this time:

11011
11100
11101
11110
11111

So, in order to use this system we cannot have numbers included with the letters.

An all-digit system would require only four bits. But then the operator has to look up a table in which each instrument is assigned a number.

A combined letter and number system would require six bits of standardized ASCII characters. It can be seen, however, that each additional bit increases the memory capacity considerably; so that at this point it is recommended to stay with letters only.

One difficulty arises from the fact that normal recognition routines require a predetermined spelling of each name. Frequently the routine is written so that it only requires enough sequential characters to be unique. Thus each instrument record can only be accessed if the proper name in its proper spelling (or its abbreviation) is entered.

The compromise is then to use only a few letters to identify each instrument, yet use enough to remember the name correctly with not too much strain. A choice of 9 or 12 letters seems favorable also for the computer as the following table shows

Letters	Computer-words	
	8 bit	16 bit
3	2	1
4	3	2
6	4	2
8	5	3
9	6	3
11	7	4
12	8	4

To illustrate the restriction imposed by this selection some instrument names are given as they might appear in the 9 character letter code:

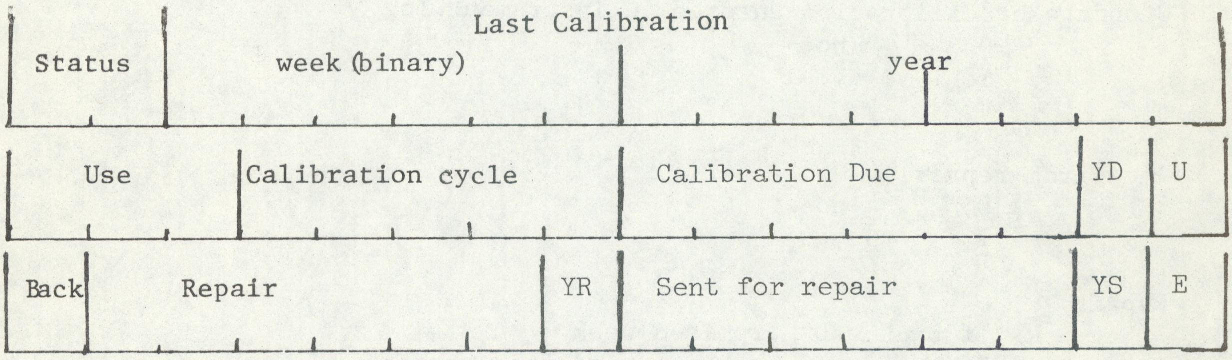
LYMAN GE	FSSP	TEMP A
JW WATER	CLOUD PAR	PITOT C
ICE DETEC	PRECIP	FLOW B
RADAR ALT	FRO RAD B	IR AIR C
ICE PART	BEL RAD A	IR SURF B
ICE NUCL	TAIL RA A	GE DEW A
NEPHELOM	GUST PRO B	CSI DEW C

REPLICAT	PYROTECHN	MICROW RA
NIM BIOMET	AX BT	INE B
ASSP	DROPSONDE	ONE A

With the nine letter code each instrument is characterized by 45 bits. If we store the information for each instrument directly underneath the identifying word and arrange the list with equal spacing we do not need a separate index. Thus if we use 48 bits for information on the instrument we have 96 bits per instrument.

If we restrict the number of instruments to 85 we need 8160 bits (8 K) for data storage. Allocating additional 16 K bits for the programs we have a minimal arrangement in which the processor and memory costs are only a fraction of the peripherals (keyboard, CRT printer and cassette) but which is quite valuable to store and retrieve status, calibration and repair data.

In the following an example of a possible information word structure is given



Status

00	good
01	marginal
10	needs repair
11	in repair

Last Calibration

010110	(=22) week 1-52 in binary
0100 1110	(=78) year in binary

Use

000	not in use
001	C-130
010	P3-42
011	P3-43
100 101 110 111	to be assigned

Calibration Cycle

00000	at general inspection
00001	every 2 * 1 = 2 weeks
'	
'	
'	
11111	every 2 * 31 62 weeks

Calibration Due

000001	week of year (binary)
'	
'	
'	
110100	52nd week of year

YD year calibration due

0	this year
1	next year

U Update of calibration entered in instrument log

0	no
1	yes

Back from repair

0	no
1	yes

Repair

If back = 0 promised week
If back = 1 week returned from repair

000001	first week of year
'	
'	
'	
110100	last week of year

YR (year of repair) combined with "sent for repair"

1001101	(=77) year in binary

Sent for repair

000001	first week of year
'	
'	
'	
110100	last week of year

YS (year sent for repair)

0	this year
1	previous year

E (repair entered in instrument log)

0 no

1 yes

Several programs are needed to utilize this system:

a) updating of year and week

b) entry of use

calibration

repair

c) entering of repair into instrument log

d) entering of calibration into instrument log

e) output of calibrations due

this week

within the next n weeks

f) output of all instruments presently used on a particular aircraft

g) output of all instruments in repair with sent and due dates

The simplest implementation uses a remote terminal to access a central computer which stores programs and data and which provides all the computing and data handling power. The terminal has to have a keyboard and a data display and preferably a hard copy unit in the form of a printer. Copies of important files are available independent of the computer.

Since most of the costs in a computing system are in the peripherals and software, only a relatively small increase in the price is incurred for an individual computing system. For the present purpose of microprocessor can be used.

For 85 instruments, 8160 bits of storage are needed for the data bank. The data have to be preserved when the power is off. Thus either core or disk memory has to be used or volatile random access memory (RAM) which can be loaded by a tape and, after all the entries are made, can be dumped back on tape. A direct operation from and to cassette is not practical. At a read or recording speed of 120 16-bit words per second it takes up to 5 seconds to get to the last word.

While one cassette contains the fast access records on all instruments for status, calibration and repair, another cassette stores the flight record of each aircraft as to instruments used and comments on thier operation.

With the small size of the cassettes it is possible to keep a separate cassette for each instrument. Each side of the cassette can accomodate about 75,000 characters with ample record spacing and a sufficient number of control and test characters.

The most advantageous operation of a system is obtained by working with disks, preferably several disks simultaneously. Then one disk can contain an operational system that is useful for program development and general use, while data can be transferred back and forth between the other disks. The small thickness of the floppy disks makes it even more convenient to store records of individual instruments. This system can easily be used for general computational needs in calibration and instrument development.

A common, buffered system should be used to transfer data back and forth between the status storage and the instrumentation log or the flight record.

Data should generally be available on a CRT. For a hard copy a printer can be used to produce lists and tables.

The central processor should have instructions to compute engineering calibration values or provide a fit to experimental data. It should easily be interfaceable to external instruments so that it can be used to control a calibration process and automatically accept instrument output data.

It would be desirable to have a modem connection so that an outside computer or data bank can be utilized.

In the Appendices a simulation program is implemented that works on the NOAA Boulder remote TELEX system connected to the CDC 6600. It demonstrates how the previously discussed scheme of six 16-bit words for each instrument can be operated. In the appendix the 60-bit version of the main routines is reproduced. Written in FORTRAN it can easily be optimized for the assembly language of a particular microprocessor.

This program is intended to illustrate the software of a calibration and repair retrieval system. It gives examples of programs for printing an inventory table or getting a list of instruments due for calibration or obtaining a repair catalogue to make fullest use of the storage of instrument calibration and repair data.

The main program handles the interactive determination of computer functions to be performed. A printout of an entry session is self-explanatory and provides a cross section of commands for entries, deletions, and a translation of the data contained in one log. Most operations are contained in individual subroutines. Each subroutine is listed together with a test program that demonstrates the proper operation of the routine.

TESFIND converts the up-to-9-characters-long instrument identifier to ASCII words. The operator IN=0 is used for an existing instrument log, while IN-1 is used for the entry of a new instrument.

For IN=0 the program checks the input letters for the instrument against all stored ones. As soon as it discovers a letter that is not contained in the proper position in any instrument name, it exits with N=0. The N value is equal to the times the same letters are found in different instrument names.

For N=1 the program determines, after going through all 9 letters of the instrument, how many times the same name occurs. Thus for a new entry it determines whether the instrument was already listed or whether it is really new.

CHECKDA checks the validity of the week and year entry. IW, IZ are the present week and year, while LWK and LYR are the values entered. LA can have the values -1, 0, +1. Minus one is used for a data entry that has to be previous or equal to the present data, while plus one is used for a data entry that has to be later or equal to the present date. Zero is used for checking the result of a computation for the calibration due. Whenever a value, is not valid, LA=0 adjusts the date so that for dates previous to this year the adjustment is LWK=1 and LYR=IZ. For dates later than next year the adjusted date is LWK=52 LYR=IZ+1.

For LA=-1 only dates between last year (LZ=1) including the present date (LZ=0 for this year) are admitted.

For LA=+1 only dates between the present date (LZ=0 for this year) and the end of next year are admitted.

TESTCAL enters calibration data. Before accepting new data on the last calibration, it checks whether the old data were updated, and does not allow continuation until this is done. After accepting the data on the last calibration, the calibration cycle is added and the computed value is adjusted with LA=0 in CHKDATE and entered under calibration due.

Calibration due values can be added independently if it was determined that an instrument needs calibration.

The calibration cycle is entered in multiples of 2 weeks. A maximum number of 62 weeks can be entered.

TESTREP enters repair data. If the instrument is back from repair, it enters the date when the instrument was returned. If the instrument is not back from repair, the dates are entered when the instrument was sent for repair and when it was promised to be back.

TESTLOG converts the stored data to a printout of all the data on the referenced instrument.

CALDAT contains data on 3 instruments. The first line starts with ^18, which means that 3x6 = 18 words are contained in the log. The next 3 words of 20 octal characters are a simulation of 3 words with 16 bits that start with a zero. Then the next 3x2 numbers are the ASCII equivalent of 3 letters for the instrument. For instance

11 03 05 stands for ICE. The rest of the word is filled with zeros. (In a microprocessor word of 16 bits the first bit would be a zero and the consecutive 15 characters would represent the chopped version of 3x5 ASCII characters: 00011 for ASCIIC = 000011 etc.) The first 3 words contain the instrument identifier, while the next 3 words contain the data on that instrument.

In the following sample printouts the recessed lines represent questions that the computer asks.

The characters after the initial question mark are the answers that the operator prints.

PROGRAM   CALDAT

```
 1801103050000000000000550405000000000000002405030000000000000000
746454000000000000003573240000000000000001230000000000000001
011225500000000000000011122000000000000000550355000000000000
460470000000000000001510400000000000000465144000000000000000
011030500000000000000552001000000000000002224550000000000000
000000000000000000000000000000000000000000000000000000000000
```

Data for 16-bit simulation

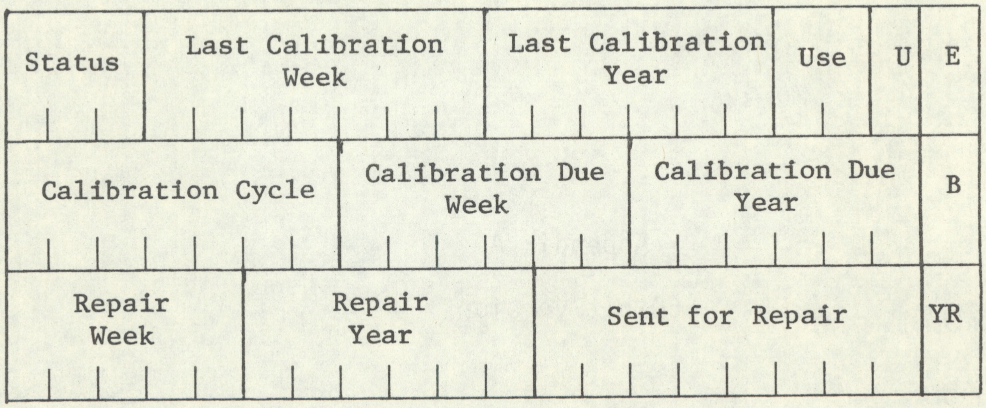
PROGRAM   CALDA

```
0061103055504052405032472514077507173124062
1122550111225522060326513202475164722600
1103055520012224550304115346403175723401
```

Data for 60-bit version

Appendix A

60 bit version



Bit arrangement in 60 bit word

PROGRAM CALNEW

```
        PRESENT WEEK,YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 32,78
        OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? N

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH 'RETURN'
? I
? C
? E
?
? D
? E
? T
? E
? C
? T

        INSTRUMENT IS ALREADY LISTED


        ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
        OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? N

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH 'RETURN'
? I
? C
? E
?
? N
? U
? C
? L
?
? C

        INSTRUMENT IS ADDED TO FILE
        DO NOT FORGET TO MAKE TAPE1 PERMANENT
```

```
    U S E :
    NOT IN USE  (0)
    C-130       (1)
    P3-42       (2)
    P3-43       (3)

? 0

    STATUS :
    GOOD           (G)
    MARGINAL       (M)
    NEEDS REPAIR   (N)
    IN REPAIR      (R)

? G
    LAST CALIBRATION :
    WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 44,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
    NEXT CALIBRATION IS DUE :
    WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 22,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    CALIBRATION SHOULD BE DONE :
             AT GENERAL INSPECTION  (00)
             EVERY .. WEEKS         (..)
? 00
    1103055516250314550 3       055160000001 60000000

    ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
    OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH 'RETURN'
? N
? E
? P
? H
? E
? L
? O
? M
? E
? T

    INSTRUMENT IS NOT FOUND
```

```
          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
     ? I
     ? R

          IR AIR RFC

          CHANGE DATA              (C)
          PRINT INSTRUMENT LOG     (I)
          DELETE INSTRUMENT        (D)

     ? C

          INSTRUMENT USE              (U)
                     STATUS           (S)
                     CALIBRATION      (C)
                     REPAIR           (R)

     ? U

          U S E :
          NOT IN USE  (0)
          C-130       (1)
          P3-42       (2)
          P3-43       (3)

     ? 3
          11225501112255220603     26513302475164722600

          ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

     ? Y
          OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
     ? O

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
     ? I
     ? R

          IR AIR RFC

          CHANGE DATA              (C)
          PRINT INSTRUMENT LOG     (I)
          DELETE INSTRUMENT        (D)

     ? C

          INSTRUMENT USE              (U)
                     STATUS           (S)
                     CALIBRATION      (C)
                     REPAIR           (R)
```

```
? S

     STATUS :
     GOOD          (G)
     MARGINAL      (M)
     NEEDS REPAIR  (N)
     IN REPAIR     (R)

? N
     11225501112255220603      46513302475164722600

     ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
     OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH 'RETURN'
? I
? R

     IR AIR RFC

     CHANGE DATA            (C)
     PRINT INSTRUMENT LOG   (I)
     DELETE INSTRUMENT      (D)

? C

     INSTRUMENT USE            (U)
                STATUS         (S)
                CALIBRATION    (C)
                REPAIR         (R)

? C

     CALIBRATION :
     LAST            (L)
     DUE             (D)
     UPDATE LOGGED   (U)
     CYCLE           (C)

? L
     LOG OLD CALIBRATION BEFORE YOU CAN ENTER NEW ONE
     11225501112255220603      46513302475164722600

     ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
     OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O
```

```
          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
? I
? R

          IR AIR RFC

          CHANGE DATA             (C)
          PRINT INSTRUMENT LOG    (I)
          DELETE INSTRUMENT       (D)

? C

          INSTRUMENT USE          (U)
                     STATUS       (S)
                     CALIBRATION  (C)
                     REPAIR       (R)

? C

          CALIBRATION :
          LAST            (L)
          DUE             (D)
          UPDATE LOGGED   (U)
          CYCLE           (C)

? U
          WAS UPDATE LOGGED ?     YES  (Y)     NO  (N)

? Y
          11225501112255220603      465133424751647226OO

          ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
          OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
? I
? R

          IR AIR RFC

          CHANGE DATA             (C)
          PRINT INSTRUMENT LOG    (I)
          DELETE INSTRUMENT       (D)
```

```
? C

          INSTRUMENT USE        (U)
                     STATUS      (S)
                     CALIBRATION (C)
                     REPAIR      (R)

? C

          CALIBRATION :
          LAST            (L)
          DUE             (D)
          UPDATE LOGGED   (U)
          CYCLE           (C)

? L
          LAST CALIBRATION :
          WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
          11225501112255220603       455163025251647226OO

          ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
          OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'

? I
? R

          IR AIR RFC

          CHANGE DATA           (C)
          PRINT INSTRUMENT LOG  (I)
          DELETE INSTRUMENT     (D)
```

```
? C

    INSTRUMENT USE          (U)
               STATUS       (S)
               CALIBRATION  (C)
               REPAIR       (R)

? R

    IS INSTRUMENT BACK FROM REPAIR ?

    YES  (Y)    NO  (N)

? Y

    WHEN WAS THE INSTRUMENT RETURNED ?
    WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 55,99
    CHECK WEEK
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
    11225501112255220603      4551630252516532340O

    ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
    OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH 'RETURN'
? I
? R

    IR AIR RFC

    CHANGE DATA            (C)
    PRINT INSTRUMENT LOG   (I)
    DELETE INSTRUMENT      (D)

? C
```

```
        INSTRUMENT USE          (U)
                   STATUS       (S)
                   CALIBRATION  (C)
                   REPAIR       (R)

? R

        IS INSTRUMENT BACK FROM REPAIR ?

        YES  (Y)     NO  (N)

? N

        WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?
? 55,99
        CHECK WEEK
        CHECK YEAR
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
        CHECK YEAR
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
        CHECK WEEK
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78

        FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?
        WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 55,99
        CHECK WEEK
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
        CHECK WEEK
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,77
        CHECK YEAR
        WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
        112255011122552206O3        45516302525162623454

        ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
        OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH 'RETURN'
? I
? R

        IR AIR RFC
```

```
        CHANGE DATA             (C)
        PRINT INSTRUMENT LOG    (I)
        DELETE INSTRUMENT       (D)

? I

        IR AIR RFC
        STATUS : NEEDS REPAIR
        LAST CALIBRATION  WEEK : 22   YEAR : 78
        USE : ON P3-43
        CALIBRATION CYCLE :  EVERY  20 WEEKS
        CALIBRATION DUE :  WEEK : 42  YEAR ; 78
        LAST CALIBRATION WAS NOT ENTERED IN INSTRUMENT LOG
        SENT FOR REPAIR :  WEEK : 22  THIS YEAR
        PROMISED TO BE BACK FROM REPAIR :  WEEK : 44  YEAR : 78
        11225501112255220603      45516302525162623454

        ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
        OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? O

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH 'RETURN'
? I
? R

        IR AIR RFC

        CHANGE DATA             (C)
        PRINT INSTRUMENT LOG    (I)
        DELETE INSTRUMENT       (D)

? D

        INSTRUMENT IS DELETED FROM LIST
        DO NOT FORGET TO MAKE TAPE1 PERMANENT

        ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
        OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? L
        GENERAL      (G)
        CALIBRATION  (C)
        USE          (U)
        REPAIR       (R)
```

? G

N A M E	STAT	USE	CALIBRATION LAST	LOG	CYCLE	DUE	REPAIR IN	SENT	PROMISED	LAST	LOG
ICE DETECT	R	0	42 76	X	124	35 79	X	25 78	50 80	0 0	X
ICE PART C	G	3	16 77	X	52	1 79		0 0	0 0	30 78	
ICE NUCL C	G	0	22 78		0	0 14	X	0 78	0 0	0 0	

ARE THERE MORE INSTRUMENTS ? (YES) (NO)

? Y

OLD (O) OR NEW (N) INSTRUMENT OR LIST (L) ?

? L

GENERAL (G)
CALIBRATION (C)
USE (U)
REPAIR (R)

? C

DUE FOR CALIBRATION WITHIN NEXT .. WEEKS
PRINT WEEKS

? 60

N A M E	CALIBRATION DUE WEEK	YEAR
ICE DETECT	35	79
ICE PART C	1	79
ICE NUCL C	0	14

ARE THERE MORE INSTRUMENTS ? (YES) (NO)

? Y

OLD (O) OR NEW (N) INSTRUMENT OR LIST (L) ?

? L

GENERAL (G)
CALIBRATION (C)
USE (U)
REPAIR (R)

? U

USE OF INSTRUMENT
NOT IN USE (0)
ON C-130 (1)
ON P3-42 (2)
ON P3-43 (3)

? 0

```
LIST OF INSTRUMENTS NOT IN USE

ICE DETECT

ICE NUCL C

ARE THERE MORE INSTRUMENTS ?  (YES)    (NO)

? Y
OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? L
GENERAL      (G)
CALIBRATION (C)
USE          (U)
REPAIR       (R)
? U
USE OF INSTRUMENT
       NOT IN USE  (0)
       ON C-130    (1)
       ON P3-42    (2)
       ON P3-43    (3)
? 3
LIST OF INSTRUMENTS ON P3-43

ICE PART C

ARE THERE MORE INSTRUMENTS ?  (YES)    (NO)

? Y
OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?
? L
GENERAL      (G)
CALIBRATION (C)
USE          (U)
REPAIR       (R)
? R
INSTRUMENTS IN REPAIR :
              S E N T    PROMISED
  N A M E    WEEK YEAR   WEEK YEAR

ICE DETECT    25   78     50   80
ICE NUCL C     0   78      0    0

ARE THERE MORE INSTRUMENTS ?  (YES)    (NO)

? N
```

PROGRAM CALNEW

```
      PROGRAM INSTRUM (INPUT,OUTPUT,TAPE1)
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
      DIMENSION NIA(3),NIB(4),NIC(4),NID(4),NIE(2),NIF(2),
      NIG(2),NIP(4),NIV(4)
    1 FORMAT (/5X*PRESENT WEEK,YEAR (LAST TWO DIGITS OF YEAR ONLY)*)
    2 FORMAT (/5X,A10)
    3 FORMAT (I2,1X,I2)
    4 FORMAT (I3,2020)
    5 FORMAT (2020)
    6 FORMAT (3(5X,020))
    7 FORMAT (A1)
    8 FORMAT ( 5X*OLD  (O)  OR NEW  (N)  INSTRUMENT  OR LIST (L) ?*)
    9 FORMAT (/5X*INSTRUMENT IS LISTED MORE THAN ONCE*/)
   10 FORMAT (/5X*INSTRUMENT IS NOT FOUND*/)
   11 FORMAT (/5X*INSTRUMENT IS ALREADY LISTED*//)
   12 FORMAT (/5X*INSTRUMENT IS ADDED TO FILE*/
                5X*DO NOT FORGET TO MAKE TAPE1 PERMANENT*/)
   13 FORMAT (/5X*INSTRUMENT IS DELETED FROM LIST*/
                5X*DO NOT FORGET TO MAKE TAPE1 PERMANENT*/)
   14 FORMAT (/5X*CHANGE DATA*11X*(C)*/5X*PRINT INSTRUMENT LOG  (I)*/
                5X*DELETE INSTRUMENT*5X*(D)*/)
   15 FORMAT (/5X*INSTRUMENT USE*10X*(U)*/16X*STATUS*7X*(S)*/
                16X*CALIBRATION  (C)*/16X*REPAIR*7X*(R)*/)
   16 FORMAT (/5X*ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)*/)
   17 FORMAT (5X*GENERAL*5X*(G)*/5X*CALIBRATION (C)*/
               5X*USE*9X*(U)*/5X*REPAIR*6X*(R)*)
   18 FORMAT (25X*C A L I B R A T I O N*6X*R  E  P  A  I  R*/
               6X*N A M E  STAT USE  LAST LOG CYCLE  DUE   IN *
               *SENT PROMISED  LAST LOG*/)
   19 FORMAT (5X*DUE FOR CALIBRATION WITHIN NEXT .. WEEKS*/
               5X*PRINT WEEKS*)
   20 FORMAT (16X*CALIBRATION DUE*/6X*N A M E*6X*WEEK YEAR*/)
   21 FORMAT (5X,A10,5X,I2,3X,I2)
   23 FORMAT (I1)
   24 FORMAT (5X*LIST OF INSTRUMENTS *A10/)
   25 FORMAT (5X*INSTRUMENTS IN REPAIR :*/
               20X*S E N T*4X*PROMISED*/6X*N A M E*6X
               *WEEK YEAR   WEEK YEAR*/)
   26 FORMAT (5X,A10,2(5X,I2,3X,I2))
   22 FORMAT (5X*USE OF INSTRUMENT*/12X*NOT IN USE  (0)*/
               12X*ON C-130      (1)*/12X*ON P3-42     (2)*/
               12X*ON P3-43    (3)*)
      DATA (NIP=1HG,1HC,1HU,1HR)
      DATA (NIB=1HU,1HS,1HC,1HR)
      DATA (NIV=10HNOT IN USE,8HON C-130,8HON P3-42,8HON P3-43)
```

```
      NL=0
      PRINT 1
      READ 3,IW,IZ
      READ (1,4) M,(LOC(I),I=1,2)
      READ (1,5) (LOC(I),I=3,M)
C     GOTO 110
C     PRINT 6,(LOC(I),I=1,M)
  100 PRINT 8
      READ 7, NCH
      IF (NCH .EQ. 1HO)  GOTO 110
      IF (NCH .EQ. 1HN)  GOTO 140
      IF (NCH .EQ. 1HL)  GOTO 240
      GOTO 100
C   --- OLD INSTRUMENT  ---
  110 IN=0
      CALL FINDNAM
      IF (N .LE. 1)  GOTO 115
      PRINT 9
  115 IF (N .EQ. 0)  GOTO 125
      IA=NC(1)
      PRINT 2, LOC(IA)
      GOTO 130
  125 PRINT 10
      GOTO 110
  130 PRINT 14
      READ 7, NDI
      IF (NDI .EQ. 1HC)  GOTO 309
      IF (NDI .EQ. 1HI)  GOTO 135
      IF (NDI .EQ. 1HD)  GOTO 200
      GOTO 130
  135 CALL INSTLOG
      GOTO 800
C   --- NEW INSTRUMENT  ---
  140 IN=1
      CALL FINDNAM
      IF (N .NE. 0) 150,160
  150 PRINT 11
      GOTO 810
  160 LOC(M+1)=NAM
      LOC(M+2)=0000004000000000000B
      IA=M+1
      M=M+2
      REWIND 1
      WRITE (1,4) M,(LOC(I),I=1,M)
      PRINT 12
      GOTO 330
C   --- DELETE INSTRUMENT  ---
  200 M=M-2
      DO 230  I=IA,M
      LOC(I)=LOC(I+2)
  230 CONTINUE
      LOC(M+1)=LOC(M+2)=0
      REWIND 1
```

```
      WRITE (1,4) M,(LOC(I),I=1,M)
      PRINT 13
      GOTO 810
C    --- L I S T I N G ---
  240 PRINT 17
      READ 7, NL1
      DO 250  I=1,4
      IF (NLI .EQ. NIP(I))  GOTO 260
  250 CONTINUE
      GOTO 240
  260 GOTO (270,285,299,301), I
  270 PRINT 18
      NL=1
      DO 280  I=1,M,2
      IA=I
      CALL INSTLOG
  280 CONTINUE
      GOTO 810
C    ---  CALIBRATION DUE  ---
  285 PRINT 19
      READ 3, NCA
      NW=IW+NCA
      NY=IZ
  288 IF (NW .LE. 52)  GOTO 290
      NW=NW-52
      NY=NY+1
      GOTO 288
  290 PRINT 20
      DO 298  IA=2,M,2
      NWK=LOC(IA).AND.00000000176000000000B
      NWK=SHIFT(NWK,-28)
      NYR=LOC(IA).AND.00000000001770000000B
      NYR=SHIFT(NYR,-21)
      IF (NYR .GT. NY)  GOTO 298
      IF (NYR .LT. NY)  GOTO 295
      IF (NWK .GT. NW)  GOTO 298
  295 PRINT 21, LOC(IA),NWK,NYR
  298 CONTINUE
      GOTO 810
C     ---  USE OF INSTRUMENTS  ---
  299 PRINT 22
      READ 23, IUS
      PRINT 24, NIV(IUS+1)
```

```
      DO 300  IA=1,M,2
      NIU=LOC(IA+1).AND.00000700000000000000B
      NIU=SHIFT(NIU,-42)
      IF (NIU .EQ. IUS)  PRINT 2, LOC(IA)
  300 CONTINUE
      GOTO 810
C  ---  INSTRUMENTS IN REPAIR  ---
  301 PRINT 25
      DO 302  IA=2,M,2
      NIR=LOC(IA).AND.4000000B
      IF (NIR .NE. 0)  GOTO 302
      NWS=LOC(IA).AND.176B
      NWS=SHIFT(NWS,-1)
      NYI=LOC(IA) .AND. 1
      NYS=IZ
      IF (NYI .EQ. 1)  NYS=IZ-1
      NWP=LOC(IA).AND.3740000B
      NWP=SHIFT(NWP,-14)
      NYP=LOC(IA).AND.37600B
      NYP=SHIFT(NYP,-7)
      PRINT 26, LOC(IA-1),NWS,NYS,NWP,NYP
  302 CONTINUE
      GOTO 810
C  ---  CHANGE DATA  ---
  309 PRINT 15
      READ 7, NIK
      DO 310  I=1,4
      IF (NIK .EQ. NIB(I))  GOTO 320
  310 CONTINUE
      GOTO 309
  320 GOTO (330,340,400,550), I
  330 CALL INSTUSE
      IF (IN .NE. 1)  GOTO 800
  340 CALL INSSTAT
      IF (IN .NE. 1)  GOTO 800
  400 CALL INSTCAL
      GOTO 800
  550 CALL INSTREP
  800 PRINT 6, LOC(IA),LOC(IA+1)
C     GOTO 400
  810 PRINT 16
      READ 7, NMI
      IF (NMI .EQ. 1HY)  GOTO 100
      IF (NMI .EQ. 1HN)  STOP
      GOTO 810
      END
```

```
      SUBROUTINE INSTUSE
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
    1 FORMAT (/5X*U S E :*/5X*NOT IN USE  (0)*/5X*C-130        (1)*/
            5X*P3-42          (2)*/5X*P3-43          (3)*/)
    2 FORMAT (I1)
      PRINT 1
      READ 2, NUS
      NUS=SHIFT(NUS,42)
      IB=IA+1
      LOC(IB)=LOC(IB) .AND. 77777077777777777777B
      LOC(IB)=LOC(IB) .OR. NUS
      RETURN
      END
      SUBROUTINE INSSTAT
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
      DIMENSION NIC(4)
    1 FORMAT (/5X*STATUS :*/5X*GOOD*10X*(G)*/5X*MARGINAL*6X*(M)*/
              5X*NEEDS REPAIR  (N)*/5X*IN REPAIR      (R)*/)
    2 FORMAT (A1)
      DATA (NIC=1HG,1HM,1HN,1HR)
  340 PRINT 1
      READ 2, NCO
      DO 350  I=1,4
      IF (NCO .EQ. NIC(I))  GOTO 360
  350 CONTINUE
      GOTO 340
  360 NST=SHIFT(I-1,58)
      IC=IA+1
      LOC(IC)=LOC(IC) .AND. 17777777777777777777B
      LOC(IC)=LOC(IC) .OR. NST
      RETURN
      END
```

PROGRAM   TFIND

```
00100         PROGRAM TESFIND (INPUT,OUTPUT,TAPE1)
00110         COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
00120       1 FORMAT (5X*OLD  (O)   OR NEW  (N)  INSTRUMENT ?*)
00130       2 FORMAT (A1)
00140       3 FORMAT (I3,20O20)
00150       4 FORMAT (20O20)
00160       5 FORMAT (5X*N = *I2,5X*NC = *I2)
00340       6 FORMAT (5X,O20)
00170         READ (1,3), M,(LOC(I),I=1,2)
00180         READ (1,4), (LOC(I),I=3,M)
00190     100 PRINT 1
00200         READ 2, ION
00210         IF (ION .EQ. 1HO)  GOTO 200
00220         IN=1
00230         GOTO 300
00240     200 IN=0
00250     300 CALL FINDNAM
00260         PRINT 5, N,NC(1)
00850         PRINT 6, NAM
00270         GOTO 100
00280         END
00290         SUBROUTINE FINDNAM
00300         COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
00310       1 FORMAT (A1)
00320       2 FORMAT (/5X*NAME OF INSTRUMENT ?*/
00330+        5X*PRINT EACH LETTER WITH 'RETURN'*)
00350         DATA (MASK=77B)
00360     100 PRINT 2
00370         JM=1
00380         IC=-1
00390         ID=1
00400         IF=0
00410         MS=60
00420         N=1
00430         NAM=0
00440         NN=M/2
00450         DO 400  J=1,10
00460         MS=MS-6
00470         MSK=SHIFT(MASK,MS)
00480C        PRINT 10, MSK
00490         READ 1, IQ
00500C        PRINT 10, IQ
00510C     10 FORMAT (5X,O20)
00520         IQ=SHIFT (IQ,IF)
00530C        PRINT 10, IQ
00540         IK=54+IF
00550         MK=SHIFT(MASK,IK)
00560         IQ=IQ .AND. MK
00570C        PRINT 10, IQ
```

```
      NAM=NAM .OR. IQ
C     PRINT 11, NAM
C  11 FORMAT (5X*NAM = *O20)
      IF (N .EQ. 0)  GOTO 350
      N=0
      DO 300  I=1,NN
      GOTO (120,150),ID
  120 IC=IC+2
      GOTO 200
  150 IC=NC(I)
  200 IB=LOC(IC) .AND. MSK
C     PRINT 4, IB,LOC(IC),IC
C   4 FORMAT (5X,O20,3X,O20,5X,I2)
      IF (IQ .NE. IB)  GOTO 300
      N=N+1
      NC(N)=IC
  300 CONTINUE
C     PRINT 12, NN,N,(NC(L),L=1,N)
C  12 FORMAT (5X*NN= *I3,3X*N = *I3,3X*NC = *6I3)
      IF ((N .EQ. 1).AND.(IN .EQ. 0)) RETURN
      NN=N
  350 ID=2
      IF=IF-6
  400 CONTINUE
      DO 450  L=1,NN
      NC(L)=NC(L)+1
  450 CONTINUE
      RETURN
      END
```

```
        OLD  (O)   OR NEW  (N)  INSTRUMENT ?
    ? O

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH 'RETURN'
        77000000000000000000
    ? I
        11555555555555555555
        11555555555555555555
        11000000000000000000
        NAM = 11000000000000000000
        11000000000000000000   11030555040524050324        1
        11000000000000000000   11225501112255220603        3
        11000000000000000000   11030555200122245503        5
        NN=    3   N =    3   NC =    1   3   5
        00770000000000000000
    ? C
        03555555555555555555
        00035555555555555555
        00030000000000000000
        NAM = 11030000000000000000
        00030000000000000000   11030555040524050324        1
        00220000000000000000   11225501112255220603        3
        00030000000000000000   11030555200122245503        5
        NN=    3   N =    2   NC =    1   5
        00007700000000000000
    ? E
        05555555555555555555
        00000555555555555555
        00000500000000000000
        NAM = 11030500000000000000
        00000500000000000000   11030555040524050324        1
        00000500000000000000   11030555200122245503        5
        NN=    2   N =    2   NC =    1   5
        00000077000000000000
    ?
        55555555555555555555
        77777755555555555555
        00000055000000000000
        NAM = 11030555000000000000
        00000055000000000000   11030555040524050324        1
        00000055000000000000   11030555200122245503        5
        NN=    2   N =    2   NC =    1   5
        00000000770000000000
    ? D
        04555555555555555555
        00000000045555555555
        00000000040000000000
        NAM = 11030555040000000000
        00000000040000000000   11030555040524050324        1
        00000000020000000000   11030555200122245503        5
        NN=    2   N =    1   NC =    1
        N =   1       NC =   1
        11030555040000000000
```

```
PROGRAM   TFIND

          OLD  (O)   OR NEW  (N)  INSTRUMENT ?
? O

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
? I
? R
          N =  1      NC =  3
          11220000000000000000
          OLD  (O)   OR NEW  (N)  INSTRUMENT ?
? N

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
? I
? C
? E
?
? D
? E
? T
? E
? C
? T
          N =  1      NC =  2
          11030555040524050324
          OLD  (O)   OR NEW  (N)  INSTRUMENT ?
? N

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH 'RETURN'
? I
? C
? E
?
? N
? U
? C
? L
?
? C
          N =  0      NC =  2
          11030555162503145503
```

78/09/20. 10.06.49.
PROGRAM   TESCAL

```
       PROGRAM TESTCAL (INPUT,OUTPUT)
       COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
C     --- NEEDS SUBROUTINES CHKDATE AND INSTCAL ---
     1 FORMAT (3(5X,O20))
       DATA ((LOC(I),I=1,2)=11030555040524050324B,
              72514037507173124062B)
       DATA (IA=1),(IW=32),(IZ=78)
   100 CALL INSTCAL
       PRINT 1, (LOC(I),I=1,2)
       GOTO 100
       END
       SUBROUTINE INSTCAL
       COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
       DIMENSION NID(4)
     1 FORMAT (/5X*CALIBRATION :*/5X*LAST*11X*(L)*/5X*DUE*12X*(D)*/
                5X*UPDATE LOGGED  (U)*/5X*CYCLE            (C)*/)
     2 FORMAT (A1)
     3 FORMAT (5X*LOG OLD CALIBRATION BEFORE YOU CAN ENTER NEW ONE*)
     4 FORMAT (5X*WEEK,   YEAR(LAST TWO DIGITS ONLY)*/)
     5 FORMAT (I2,1X,I2)
     6 FORMAT ( 5X*CHECK WEEKS.  (LESS THAN 127)*)
     7 FORMAT (5X*LAST CALIBRATION :*)
     8 FORMAT (5X*WAS UPDATE LOGGED ?*5X*YES  (Y)    NO  (N)*/)
     9 FORMAT (5X*CALIBRATION SHOULD BE DONE :*/
               12X*AT GENERAL INSPECTION  (00)*/
               12X*EVERY .. WEEKS         (..)*)
    10 FORMAT (I3)
    11 FORMAT (5X*NEXT CALIBRATION IS DUE :*)
       DATA (NCL=00000040000000000000B),(NID=1HL,1HD,1HU,1HC)
   400 PRINT 1
       READ 2, NCA
       DO 410  I=1,4
       IF (NCA .EQ. NID(I))  GOTO 420
   410 CONTINUE
       GOTO 400
   420 GOTO (430,460,500,530), I
C     --- LAST CALIBRATION  ---
   430 NCE=LOC(IA+1) .AND. 00000040000000000000B
       IF (NCE .EQ. NCL)  GOTO 440
       PRINT 3
       RETURN
```

```
  440 PRINT 7
      PRINT 4
      READ 5, IWK,IYR
      CALL CHKDATE (IW,IZ,-1,IWK,IYR,IWZ)
      IWS=SHIFT(IWK,52)
      IYS=SHIFT(IYR,45)
      IE=IA+1
      LOC(IE)=LOC(IE) .AND. 60000737777777777777B
      LOC(IE)=LOC(IE) .OR. IWS .OR. IYS
      NCC=LOC(IE) .AND. 00000017600000000000B
      NCC=SHIFT(NCC,-33)
      IWE=IWK+NCC
      CALL CHKDATE (IW,IZ,0,IWE,IYR,IZE)
      IYE=IYR
      GOTO 465
C  ---  CALIBRATION DUE  ---
  460 PRINT 11
      PRINT 4
      READ 5, IWE,IYE
      CALL CHKDATE (IW,IZ,1,IWE,IYE,IZE)
  465 IWE=SHIFT(IWE,28)
      IYE=SHIFT(IYE,21)
      IF=IA+1
      LOC(IF)=LOC(IF) .AND. 77777777600007777777B
      LOC(IF)=LOC(IF) .OR. IWE .OR. IYE
      RETURN
C  ---  CALIBRATION UPDATE LOGGED  ---
  500 PRINT 8
      READ 2, NUE
      IG=IA+1
      LOC(IG)=LOC(IG) .AND. 77777737777777777777B
      IF (NUE .EQ. 1HN)  RETURN
      LOC(IG)=LOC(IG) .OR. 00000040000000000000B
      IF (NUE .NE. 1HY)  500,520
  520 RETURN
C  ---  CALIBRATION CYCLE  ---
  530 PRINT 9
      READ 10, NWW
      IF (NWW .LE. 128)  GOTO 540
      PRINT 6
      GOTO 530
  540 NWW=SHIFT(NWW,33)
      IH=IA+1
      LOC(IH)=LOC(IH) .AND. 77777760177777777777B
      LOC(IH)=LOC(IH) .OR. NWW
      RETURN
      END
```

```
PROGRAM   TESCAL


          CALIBRATION :
          LAST          (L)
          DUE           (D)
          UPDATE LOGGED (U)
          CYCLE         (C)

? L
          LOG OLD CALIBRATION BEFORE YOU CAN ENTER NEW ONE
          11030555040524050324     72514037507173124062

          CALIBRATION :
          LAST          (L)
          DUE           (D)
          UPDATE LOGGED (U)
          CYCLE         (C)

? U
          WAS UPDATE LOGGED ?    YES  (Y)    NO  (N)

? Y
          11030555040524050324     72514077507173124062

          CALIBRATION :
          LAST          (L)
          DUE           (D)
          UPDATE LOGGED (U)
          CYCLE         (C)

? L
          LAST CALIBRATION :
          WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
          11030555040524050324     65516037551173124062
```

```
CALIBRATION :
LAST           (L)
DUE            (D)
UPDATE LOGGED  (U)
CYCLE          (C)

? D
NEXT CALIBRATION IS DUE :
WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
CHECK WEEK
CHECK YEAR
WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
CHECK YEAR
WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
CHECK WEEK
WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
11030555040524050324      65516037531163124062

CALIBRATION :
LAST           (L)
DUE            (D)
UPDATE LOGGED  (U)
CYCLE          (C)

? C
CALIBRATION SHOULD BE DONE :
       AT GENERAL INSPECTION  (00)
       EVERY .. WEEKS         (..)
? 200
CHECK WEEKS.  (LESS THAN 127)
CALIBRATION SHOULD BE DONE :
       AT GENERAL INSPECTION  (00)
       EVERY .. WEEKS         (..)
? 035
11030555040524050324      65516024331163124062
```

```
      PROGRAM TESTREP (INPUT,OUTPUT)
C    --- NEEDS SUBROUTINES CHKDATE AND INSTREP ---
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
    1 FORMAT (3(5X,O20))
      DATA ((LOC(I),I=1,2)=11030555040524050324B,
              72514077507173124062B)
      DATA (IA=1),(IN=0),(IW=32),(IZ=78)
  100 CALL INSTREP
      PRINT 1, (LOC(I),I=1,2)
      GOTO 100
      END
      SUBROUTINE INSTREP
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
    1 FORMAT (/5X*IS INSTRUMENT BACK FROM REPAIR ?*)
    2 FORMAT (/5X*YES  (Y)     NO  (N)*/)
    3 FORMAT ( A1)
    4 FORMAT (/5X*WHEN WAS THE INSTRUMENT RETURNED ?*)
    5 FORMAT (/5X*WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?*)
    6 FORMAT ( I2,1X,I2)
    7 FORMAT (/5X*CHECK WEEK*)
    9 FORMAT (/5X*FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?*)
   10 FORMAT ( 5X*WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)*)
  550 PRINT 1
      PRINT 2
      READ 3, NRP
      IF (NRP .EQ. 1HN)  GOTO 580
C         ---  INSTRUMENT WAS RETURNED  ---
      PRINT 4
      PRINT 10
      READ 6, NRW,NRY
      IBR=00000000000004000000B
      CALL CHKDATE (IW,IZ,-1,NRW,NRY,NRZ)
      NRW=SHIFT(NRW,14)
      NRY=SHIFT(NRY,7)
      IJ=IA+1
      LOC(IJ)=LOC(IJ) .AND. 7777777777774000177B
      LOC(IJ)=LOC(IJ) .OR. IBR .OR. NRW .OR. NRY
      RETURN
C     ---  NOT RETURNED  ---
  580 PRINT 5
      READ 6, NSW,NSY
      CALL CHKDATE (IW,IZ,-1,NSW,NSY,NSZ)
      NSW=SHIFT (NSW,1)
      PRINT 9
      PRINT 10
      READ 6,NTW,NTY
      CALL CHKDATE (IW,IZ,1,NTW,NTY,NTZ)
      NTW=SHIFT (NTW,14)
      NTY=SHIFT (NTY,7)
      IK=IA+1
      LOC(IK)=LOC(IK) .AND. 77777777777770000000B
      LOC(IK)=LOC(IK) .OR. NSW .OR. NSZ .OR. NTW .OR. NTY
      RETURN
      END
```

```
PROGRAM   TESREP


         IS INSTRUMENT BACK FROM REPAIR ?

         YES  (Y)    NO  (N)

? Y

         WHEN WAS THE INSTRUMENT RETURNED ?
         WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 55,99
         CHECK WEEK
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
         CHECK WEEK
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
         11030555040524050324     72514077507175323462

         IS INSTRUMENT BACK FROM REPAIR ?

         YES  (Y)    NO  (N)

? N

         WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?
? 55,99
         CHECK WEEK
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
         CHECK WEEK
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78

         FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?
         WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 55,99
         CHECK WEEK
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,99
         CHECK YEAR
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
         CHECK WEEK
         WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
         11030555040524050324     72514077507172623454
```

PROGRAM TESLOG

```
      PROGRAM TESTLOG (INPUT,OUTPUT,TAPE1)
C    ---  NEEDS DATA : TAPE1=CALDA  ---
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
    1 FORMAT (I3,20O20)
    2 FORMAT (20O20)
    3 FORMAT (/5X*PRINT ODD NUMBER FOR INSTRUMENT *
+              *WORD NUMBER :*)
    4 FORMAT (I1)
    5 FORMAT (25X*C A L I B R A T I O N*6X*R  E  P  A  I  R*/
+            6X*N A M E   STAT USE  LAST LOG CYCLE  DUE   IN *
+            *SENT PROMISED  LAST LOG*/)
      DATA (IA=1),(IN=0),(IZ=78)
      NL=0
      READ (1,1) M,(LOC(I),I=1,2)
      READ (1,2) (LOC(I),I=3,M)
  100 PRINT 3
      READ 4, IA
      IF (IA .EQ. 0)  GOTO 200
      CALL INSTLOG
      GOTO 100
  200 NL=1
      PRINT 5
      DO 300  IA=1,M,2
      CALL INSTLOG
  300 CONTINUE
      END
      SUBROUTINE INSTLOG
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM,N,NC(30),NL
      DIMENSION NIC(4,2),NID(4),NIF(2),NIG(2),NIH(4),NIK(2),NIL(2)
    1 FORMAT (/5X,A10/5X*STATUS : *A10,A2/5X*LAST CALIBRATION*
+            *  WEEK : *I2,3X*YEAR : *I2/5X*USE : *A10/
+            5X*CALIBRATION CYCLE :  EVERY *I3* WEEKS*/
+            5X*CALIBRATION DUE :  WEEK : *I2,2X*YEAR ; *I2/
+            5X*LAST CALIBRATION WAS *A3* ENTERED IN *
+            *INSTRUMENT LOG*)
    2 FORMAT ( 5X*SENT FOR REPAIR :  WEEK : *I2,2X,A4,1X*YEAR*/
+            5X*PROMISED TO BE BACK FROM REPAIR : *
+            * WEEK : *I2,2X*YEAR : *I2)
    3 FORMAT (5X*LAST REPAIR WAS IN WEEK : *I2,3X*YEAR  *I2)
    4 FORMAT (5X*LAST REPAIR WAS *A3* ENTERED IN INSTRUMENT LOG*)
    5 FORMAT (5X,A10,3X,A1,3X,I1,2X,I2,1X,I2,2X,A1,3X,I3,
+           2X,I2,1X,I2,2X,A1,3(2X,I2,1X,I2),2X,A1)
      DATA (NIC=10HGOOD      ,10HMARGINAL  ,10HNEEDS REPA,
+           10HIN REPAIR ,2H  ,2H  ,2HIR,2H  )
      DATA (NID=10HNOT IN USE,10HON C-130  ,10HON P3-42  ,
+          10HON P3-43  )
      DATA (NIF=3HNOT,3H   )
      DATA (NIG=4HTHIS,4HLAST)
      DATA (NIH=1HG,1HM,1HN,1HR),(NIK=1H ,1HX)
```

```
600 IPL=LOC(IA+1)
    IPA=IPL .AND. 60000000000000000000B
    IPA=SHIFT(IPA,-58)
    IPA=IPA .AND. 00000000000000000003B
    IPA=IPA+1
    IPC=IPL .AND. 17600000000000000000B
    IPC=SHIFT(IPC,-52)
    IPY=IPL .AND. 00177000000000000000B
    IPY=SHIFT(IPY,-45)
    IPU=IPL .AND. 00000700000000000000B
    IPU=SHIFT(IPU,-42)
    IPU=IPU .AND. 00000000000000000007B
    IPU=IPU+1
    IPV=IPL .AND. 00000040000000000000B
    IPV=SHIFT(IPV,-41)
    IPV=IPV .AND. 1B
    IPV=IPV+1
    IPH=IPL .AND. 00000020000000000000B
    IPH=SHIFT(IPH,-40)
    IPH=IPH .AND. 1B
    IPH=IPH+1
    IPF=IPL .AND. 00000017600000000000B
    IPF=SHIFT(IPF,-33)
    IPD=IPL .AND. 00000000176000000000B
    IPD=SHIFT(IPD,-28)
    IPG=IPL .AND. 00000000001770000000B
    IPG=SHIFT(IPG,-21)
    IPB=IPL .AND. 00000000000004000000B
    IPB=SHIFT(IPB,-20)
    IPB=IPB .AND. 00000000000000000001B
    IPR=IPL .AND. 00000000000003740000B
    IPR=SHIFT(IPR,-14)
    IPX=IPL .AND. 00000000000000037600B
    IPX=SHIFT(IPX,-7)
    IPS=IPL .AND. 00000000000000000176B
    IPS=SHIFT(IPS,-1)
    IPE=IPL .AND. 1B
    IPE=IPE+1
    IF (NL .EQ. 1)  GOTO 700
    PRINT 1, LOC(IA),NIC(IPA,1),NIC(IPA,2),IPC,IPY,
             NID(IPU),IPF,IPD,IPG,NIF(IPV)
    IF (IPB .EQ. 1)  GOTO 650
    PRINT 2,IPS,NIG(IPE),IPR,IPX
    GOTO 850
650 PRINT 3, IPR,IPX
    PRINT 4, NIF(IPH)
700 IF (IPB .EQ. 0)  GOTO 750
    NIL(1)=NIL(2)=0
    NIM=NIN=0
    NIO=IPR
    NIP=IPX
    GOTO 800
750 NIL(1)=IZ
    NIL(2)=IZ-1
    NIM=IPR
    NIN=IPX
    NIO=NIP=0
800 PRINT 5, LOC(IA),NIH(IPA),IPU-1,IPC,IPY,NIK(IPV),IPF,IPD,
             IPG,NIK(2-IPB),IPS,NIL(IPE),NIM,NIN,NIO,NIP,NIK(IPH)
850 RETURN
    END
```

```
PROGRAM   TESLOG


     PRINT ODD NUMBER FOR INSTRUMENT WORD NUMBER :
? 3

     IR AIR RFC
     STATUS : MARGINAL
     LAST CALIBRATION  WEEK : 26   YEAR : 75
     USE : ON P3-42
     CALIBRATION CYCLE :  EVERY  20 WEEKS
     CALIBRATION DUE :  WEEK : 30  YEAR ; 78
     LAST CALIBRATION WAS NOT ENTERED IN INSTRUMENT LOG
     LAST REPAIR WAS IN WEEK : 14   YEAR  75
     LAST REPAIR WAS NOT ENTERED IN INSTRUMENT LOG
     IR AIR RFC    M    2  26 75         20  30 78      0  0   0  0  14 75

     PRINT ODD NUMBER FOR INSTRUMENT WORD NUMBER :
? 5

     ICE PART C
     STATUS : GOOD
     LAST CALIBRATION  WEEK : 16   YEAR : 77
     USE : ON P3-43
     CALIBRATION CYCLE :  EVERY  52 WEEKS
     CALIBRATION DUE :  WEEK :  1  YEAR ; 79
     LAST CALIBRATION WAS     ENTERED IN INSTRUMENT LOG
     LAST REPAIR WAS IN WEEK : 30   YEAR  78
     LAST REPAIR WAS NOT ENTERED IN INSTRUMENT LOG
     ICE PART C    G    3  16 77  X     52   1 79       0  0   0  0  30 78

     PRINT ODD NUMBER FOR INSTRUMENT WORD NUMBER :
? 0
                      C A L I B R A T I O N      R E P A I R
      N A M E  STAT USE  LAST LOG CYCLE  DUE   IN SENT PROMISED  LAST LOG

     ICE DETECT   R    0  42 76  X   124  35 79  X  25 78  50 80   0  0  X
     IR AIR RFC   M    2  26 75       20  30 78      0  0   0  0  14 75
     ICE PART C   G    3  16 77  X    52   1 79      0  0   0  0  30 78
```

PROGRAM   TECHKDA

```
      PROGRAM CHECKDA (OUTPUT,INPUT)
    1 FORMAT (5X*LA = -2, -1, 00, 01 ?*)
    2 FORMAT (I2)
    3 FORMAT (5X*WEEK,YEAR ?*)
    4 FORMAT (I2,1X,I2)
    5 FORMAT (5X*LA = *I2,3X*LWK = *I2,3X*LYR = *I2,3X*LZ = *I2)
      DATA (IW=32),(IZ=78)
  100 PRINT 1
      READ 2, LA
  200 PRINT 3
      READ 4, LWK,LYR
      IF (LYR .EQ. 0)  GOTO 100
      CALL CHKDATE (IW,IZ,LA,LWK,LYR,LZ)
      PRINT 5, LA,LWK,LYR,LZ
      GOTO 200
      END
```

```
      SUBROUTINE CHKDATE (IW,IZ,LA,LWK,LYR,LZ)
C     CALIBRATION DUE    LA=0 :COMPUTED   LA=1 :ENTERED
C     LA=-2 :LAST CALIBRATION    LA=-1 :SENT FOR REPAIR
C     LAST, THIS  YEAR
    1 FORMAT (5X*CHECK WEEK*)
    2 FORMAT (5X*CHECK YEAR*)
    3 FORMAT (5X*WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)*)
    4 FORMAT (I2,1X,I2)
  100 IF (LYR .LT. 0)  GOTO 500
      IS=IT=LZ=0
      IF (LA .NE. 0)  GOTO 300
  150 IF (LWK .LE. 52)  GOTO 200
      LWK=LWK-52
      LYR=LYR+1
      GOTO 150
  200 IF (LYR .GE. IZ)  GOTO 250
      LWK=IW
      LYR=IZ
      RETURN
  250 IF (LYR .EQ. IZ)  RETURN
      LZ=1
      RETURN
  300 IF ((LWK.GT.52).OR.(LWK.LE.0))  IS=1
      IF (LA .LT. 0)  GOTO 350
      IF (LYR .LE. IZ-1)  GOTO 500
      IF (LYR .NE. IZ)  GOTO 550
      IF (LWK .LT. IW)  450,600
  350 IF (LYR .GT. IZ)  GOTO 500
      IF (LYR .EQ. IZ)  GOTO 400
      IF (LYR .EQ. IZ-1)  GOTO 550
      IF (LA .EQ. -1)  IT=1
      GOTO 550
  400 IF (LWK .GT. IW)  450,600
  450 IS=1
      GOTO 600
  500 IT=1
      GOTO 600
  550 LZ=1
  600 IF  (IS .EQ. 1)  PRINT 1
      IF  (IT .EQ. 1)  PRINT 2
      IF ((IS.EQ.0).AND.(IT.EQ.0))  RETURN
      PRINT 3
      READ 4, LWK,LYR
      GOTO 100
      END
```

```
PROGRAM   TECHKDA

          LA = -2, -1, 00, 01 ?
? -2
          WEEK,YEAR ?
? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,80
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,79
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
          LA = -2   LWK = 22   LYR = 78   LZ =  0
          WEEK,YEAR ?
? 44,77
          LA = -2   LWK = 44   LYR = 77   LZ =  1
          WEEK,YEAR ?
? 44,55
          LA = -2   LWK = 44   LYR = 55   LZ =  1
          WEEK,YEAR ?
? 00,00
          LA = -2, -1, 00, 01 ?
? -1
          WEEK,YEAR ?
? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,80,44,79
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,55
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
          LA = -1   LWK = 22   LYR = 78   LZ =  0
          WEEK,YEAR ?
? 44,77
          LA = -1   LWK = 44   LYR = 77   LZ =  1
          WEEK,YEAR ?
? 00,00
```

```
    LA = -2, -1, 00, 01 ?
? 00
    WEEK,YEAR ?
? 55,99
    LA =  0   LWK =  3   LYR = **   LZ =  1
    WEEK,YEAR ?
? 44,55
    LA =  0   LWK = 32   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 44,77
    LA =  0   LWK = 32   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 22,78
    LA =  0   LWK = 22   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 44,78
    LA =  0   LWK = 44   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 44,79
    LA =  0   LWK = 44   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 44,80
    LA =  0   LWK = 44   LYR = 80   LZ =  1
    WEEK,YEAR ?
? 00,00
    LA = -2, -1, 00, 01 ?
? 01
    WEEK,YEAR ?
? 55,99
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,55
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,77
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 22,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    LA =  1   LWK = 44   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 44,79
    LA =  1   LWK = 44   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 44,80
    LA =  1   LWK = 44   LYR = 80   LZ =  1
    WEEK,YEAR ?
```

Appendix B

16 bit simulation

PROGRAM CALLOG

```
      PROGRAM INSTRUM (INPUT,OUTPUT,TAPE1)
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
      DIMENSION NIA(3),NIB(4),NIC(4),NID(4),NIE(2),NIF(2),NIG(2)
    1 FORMAT (/5X*PRESENT WEEK,YEAR (LAST TWO DIGITS OF YEAR ONLY)*)
    2 FORMAT (/5X,3A3)
    3 FORMAT (12,1X,12)
    4 FORMAT (13,3O20)
    5 FORMAT (3O20)
    6 FORMAT (3(5X,O20))
    7 FORMAT (A1)
    8 FORMAT (/5X*(OLD)  OR  (NEW)  INSTRUMENT ?*/)
    9 FORMAT (/5X*INSTRUMENT IS LISTED MORE THAN ONCE*/)
   10 FORMAT (/5X*INSTRUMENT IS NOT FOUND*/)
   11 FORMAT (/5X*INSTRUMENT IS ALREADY LISTED*//)
   12 FORMAT (/5X*INSTRUMENT IS ADDED TO FILE*/
+               5X*DO NOT FORGET TO MAKE TAPE1 PERMANENT*/)
   13 FORMAT (/5X*INSTRUMENT IS DELETED FROM LIST*/
+               5X*DO NOT FORGET TO MAKE TAPE1 PERMANENT*/)
   14 FORMAT (/5X*CHANGE DATA*11X*(C)*/5X*PRINT INSTRUMENT LOG  (I)*/
+               5X*DELETE INSTRUMENT*5X*(D)*/)
   15 FORMAT (/5X*INSTRUMENT USE*10X*(U)*/16X*STATUS*7X*(S)*/
+               16X*CALIBRATION  (C)*/16X*REPAIR*7X8(R)*/)
   16 FORMAT (/5X*ARE THERE MORE INSTRUMENTS?   (YES)    (NO)*/)
      DATA (IY=19)
      DATA (NIB=1HU,1HS,1HC,1HR)
      PRINT 1
      READ 3,IW,IZ
      READ (1,4) M,(LOC(I),I=1,3)
      READ (1,5) (LOC(I),I=4,M)
C     GOTO 110
C     PRINT 6,(LOC(I),I=1,M)
  100 PRINT 8
      READ 7, NCH
      IF (NCH .EQ. 1HO)  GOTO 110
      IF (NCH .EQ. 1HN)  GOTO 140
      GOTO 100
C    ---  OLD INSTRUMENT  ---
  110 IN=0
      CALL FINDNAM
      IF (N .LE. 1)  GOTO 115
      PRINT 9
  115 IF (N .EQ. 0)  GOTO 125
      IA=(NC(1)-1)/3*3+1
      DO 120  J=1,3
      NIA(J)=SHIFT(LOC(IA+J-1),3)
  120 CONTINUE
      PRINT 2, (NIA(J),J=1,3)
      GOTO 130
```

```
  125 PRINT 10
      GOTO 110
  130 PRINT 14
      READ 7, NDI
      IF (NDI .EQ. 1HC)  GOTO 300
      IF (NDI .EQ. 1HI)  GOTO 135
      IF (NDI .EQ. 1HD)  GOTO 200
      GOTO 130
  135 CALL INSTLOG
      GOTO 800
C      ---  NEW INSTRUMENT  ---
  140 IN=1
      CALL FINDNAM
      IF (N .NE. 0)  150,160
  150 PRINT 11
      GOTO 810
  160 DO 170  I=1,3
      LOC(M+I)=NAM(I)
      LOC(M+3+I)=0
  170 CONTINUE
      M=M+6
      REWIND 1
      WRITE (1,4) M,(LOC(I),I=1,M)
      PRINT 12
      GOTO 800
C     ---  DELETE INSTRUMENT  ---
  200 M=M-6
      DO 230  I=IA,M
      LOC(I)=LOC(I+6)
  230 CONTINUE
      DO 240  I+1,6
      LOC(M+I)=0
  240 CONTINUE
      REWIND 1
      WRITE (1,4) M,(LOC(I),I=1,M)
      PRINT 13
      GOTO 810
C      ---  CHANGE DATA  ---
  300 PRINT 15
      READ 7, NIK
      DO 310 I=1,4
      IF (NIK .EQ. NIB(I))  GOTO 320
  310 CONTINUE
      GOTO 300
```

```
  320 GOTO (330,340,400,550), I
  330 CALL INSTUSE
      IF (IN .NE. 1)  GOTO 800
  340 CALL INSSTAT
      IF (IN .NE. 1)  GOTO 800
  400 CALL INSTCAL
      IF (IN .NE. 1)  GOTO 800
  550 CALL INSTREP
  800 IP=IA+5
      PRINT 6, (LOC(I),I=IA,IP)
C     GOTO 400
  810 PRINT 16
      READ 7, NMI
      IF (NMI .EQ. 1HY)  GOTO 100
      IF (NMI .EQ. 1HN)  STOP
      GOTO 810
      END
      SUBROUTINE INSTUSE
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
    1 FORMAT (/5X*U S E :*/5X*NOT IN USE  (0)*/5X*C-130*7X*(1)*/
+            5X*P3-42       (2)*/5X*P3-43       (3)*/)
    2 FORMAT (I1)
      PRINT 1
      READ 2, NUS
      NUS=SHIFT(NUS,57)
      IB=IA+4
      LOC(IB)=LOC(IB) .AND. 07777400000000000000B
      LOC(IB)=LOC(IB) .OR. NUS
      RETURN
      END
      SUBROUTINE INSSTAT
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NAM(3),N,NC(30)
      DIMENSION NIC(4)
    1 FORMAT (/5X*STATUS :*/5X*GOOD*10X*(G)*/5X*MARGINAL*6X*(M)
+                  5X*NEEDS REPAIR  (N)*/5X*IN REPAIR     (R)*/)
    2 FORMAT (A1)
      DATA (NIC=1HG,1HM,1HN,1HR)
  340 PRINT 1
      READ 2, NCO
      DO 350  I=1,4
      IF (NCO .EQ. NIC(I))  GOTO 360
  350 CONTINUE
      GOTO 340
  360 NST=SHIFT(I-1,58)
      IC=IA+3
      LOC(IC)=LOC(IC) .AND. 17777400000000000000B
      LOC(IC)=LOC(IC) .OR. NST
      RETURN
      END
```

```
PROGRAM   CALLOG

     PRESENT WEEK,YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 32,78

     (OLD)  OR  (NEW)  INSTRUMENT ?

? O

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH /RETURN/
? A
? B
? C
? D
? E
? F
? G
? H
? I
     0010203000000000000      0040506000000000000      0071011000000000000

     INSTRUMENT IS NOT FOUND

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? P

     ICE PART

     CHANGE DATA          (C)
     PRINT INSTRUMENT LOG  (I)
     DELETE INSTRUMENT     (D)

? D

     INSTRUMENT IS DELETED FROM LIST
     DO NOT FORGET TO MAKE TAPE1 PERMANENT

     ARE THERE MORE INSTRUMENT ?  (YES)   (NO)

? Y

     (OLD)  OR  (NEW)  INSTRUMENT ?

? O
```

```
          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH /RETURN/
     ? I
     ? R

          IR AIR C

          CHANGE DATA              (C)
          PRINT INSTRUMENT LOG     (I)
          DELETE INSTRUMENT        (D)

     ? I

          IR AIR C
          STATUS : NEEDS REPAIR
          LAST CALIBRATION WEEK : 24    YEAR : 78
          USE : NOT IN USE
          CALIBRATION CYCLE :  EVERY 12 WEEKS
          CALIBRATION DUE :  WEEK : 36 THIS YEAR
          LAST CALIBRATION WAS      ENTERED IN INSTRUMENT LOG
          LAST REPAIR WAS IN WEEK : 13   YEAR 76
          LAST REPAIR WAS      ENTERED IN INSTRUMENT LOG
          011225500000000000     001112200000000000     055035500000000000
          460470000000000000     015104000000000000     465144000000000000

          ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

     ? Y

          (OLD)  OR  (NEW)  INSTRUMENT ?

     ? O

          NAME OF INSTRUMENT ?
          PRINT EACH LETTER WITH /RETURN/
     ? I
     ? C
     ? E
     ?
     ? N
     ? U
     ? C
     ? L
     ?
          011030500000000000     055162500000000000     003145500000000000

          INSTRUMENT IS NOT FOUND
```

```
    (OLD)  OR  (NEW)  INSTRUMENT ?

? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? R

    IR AIR C

    CHANGE DATA              (C)
    PRINT INSTRUMENT LOG     (I)
    DELETE INSTRUMENT        (D)

? C

    INSTRUMENT USE                (U)
               STATUS             (S)
               CALIBRATION        (C)
               REPAIR             (R)

? C

    CALIBRATION :
    LAST               (L)
    DUE                (D)
    UPDATE LOGGED      (U)
    CYCLE              (C)

? L

    WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 55,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 20,78
    01122550000000000000     00111220000000000000     05503550000000000000
    45061400000000000000     05775400000000000000     46514400000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)
```

```
    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? D

    ICE DETEC

    CHANGE DATA            (C)
    PRINT INSTRUMENT LOG   (I)
    DELETE INSTRUMENT      (D)

? I

    ICE DETEC
    STATUS : IN REPAIR
    LAST CALIBRATION WEEK : 51   YEAR : 75
    USE : ON P3-43
    CALIBRATION CYCLE :  EVERY 46 WEEKS
    CALIBRATION DUE :  WEEK : 45  THIS YEAR
    LAST CALIBRATION WAS     ENTERED IN INSTRUMENT LOG
    SENT FOR REPAIR : WEEK 12  THIS YEAR
    PROMISED TO BE BACK FROM REPAIR : WEEK  2  NEXT YEAR
    0110305000000000000      0550405000000000000      0240503000000000000
    7464540000000000000      3573240000000000000      0123000000000000001

    (OLD)  OR  (NEW)  INSTRUMENT ?

? )

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? R

    IR AIR C

    CHANGE DATA            (C)
    PRINT INSTRUMENT LOG   (I)
    DELETE INSTRUMENT      (D)

? C
    INSTRUMENT USE            (U)
               STATUS         (S)
               CALIBRATION    (C)
               REPAIR         (R)
```

```
? U

    U S E :
    NOT IN USE  (0)
    C-130       (1)
    P3-42       (2)    P3-43      (3)

? 3

    01122550000000000000     00111220000000000000     05503550000000000000
    4604700000000000000      31510400000000000000     46514400000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y

    (OLD)  OR  (NEW)  INSTRUMENT ?

? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? R

    IR AIR C

    CHANGE DATA            (C)
    PRINT INSTRUMENT LOG   (I)
    DELETE INSTRUMENT      (D)

? C

    INSTRUMENT USE           (U)
               STATUS        (S)
               CALIBRATION   (C)
               REPAIR        (R)

? S

    STATUS :
    GOOD           (G)
    MARGINAL       (M)
    NEEDS REPAIR   (N)
    IN REPAIR      (R)

? N
    01122550000000000000     00111220000000000000     05503550000000000000
    4604700000000000000      01510400000000000000     46514400000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)   (NO)

? Y
```

```
 ? Y

    (OLD)  OR  (NEW)  INSTRUMENT ?

?N

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? N
? U
? C
? L
?
    01103050000000000000      05516250000000000000      00314550000000000000

    INSTRUMENT IS ADDED TO FILE
    DO NOT FORGET TO MAKE TAPE1 PERMANENT

    01103050000000000000      05516250000000000000      00314550000000000000
    00000000000000000000      00000000000000000000      00000000000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)  (NO)

? Y

    (OLD)  OR  (NEW)  INSTRUMENT ?

? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/
? I
? R

    IR AIR C

    CHANGE DATA            (C)
    PRINT INSTRUMENT LOG   (I)
    DELETE INSTRUMENT      (D)

? C

    INSTRUMENT USE             (U)
               STATUS          (S)
               CALIBRATION     (C)
               REPAIR          (R)

?R
```

```
    IS INSTRUMENT BACK FROM REPAIR ?

    YES  (Y)     NO  (N)

? Y

    WHEN WAS THE INSTRUMENT RETURNED ?
    WEEK,   YEAR  (LAST TWO DIGITS OF YEAR ONLY)
? 55,99
    CHECK WEEK
    CHECK YEAR
    WEEK,  YEAR  (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 20,78
    0112255000000000000     0011122000000000000     0550355000000000000
    4604700000000000000     0151040000000000000     5651600000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)  (NO)

?Y

    (OLD)  OR  (NEW)  INSTRUMENT ?

? O

    NAME OF INSTRUMENT ?
    PRINT EACH LETTER WITH /RETURN/

? I
?? R

    IR AIR C

    CHANGE DATA              (C)
    PRINT INSTRUMENT LOG     (I)
    DELETE INSTRUMENT        (D)

? C

    INSTRUMENT USE                (U)
               STATUS             (S)
               CALIBRATION        (C)
               REPAIR             (R)

? R

    IS INSTRUMENT BACK FROM REPAIR ?

    YES  (Y)     NO  (N)
```

```
? N

    WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?
? 55,99
    CHECK WEEK
    CHECK YEAR
    WEEK,  YEAR  (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    CHECK WEEK
    WEEK,  YEAR  (LAST TWO DIGITS OF YEAR ONLY)
? 20,78

    FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?
    WEEK,  YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 20,78
    CHECK WEEK
    WEEK,  YEAR  (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
    01122550000000000000     00111220000000000000     05503550000000000000
    46047000000000000000     01510400000000000000     26050000000000000000

    ARE THERE MORE INSTRUMENTS ?  (YES)     (NO)

? N


CALDAT

 18011030500000000000000550405000000000000002405030000000000000
746454000000000000000357324000000000000001230000000000000001
011225500000000000000011122000000000000005503550000000000000
460470000000000000000151040000000000000004651440000000000000
011030500000000000000552001000000000000002224550000000000000
000000000000000000000000000000000000000000000000000000000000
```

Data simulated for 16 bit words

PROGRAM   TESFIND

```
      PROGRAM TESFIND (INPUT,OUTPUT,TAPE1)
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
    1 FORMAT (5X*OLD  (O)   OR NEW  (N)  INSTRUMENT ?*)
    2 FORMAT (A1)
    3 FORMAT (I3,3O20)
    4 FORMAT (3O20)
    5 FORMAT (5X*N = *I2,5X*NC = *I2)
      READ (1,3), M,(LOC(I),I=1,3)
      READ (1,4), (LOC(I),I=4,M)
  100 PRINT 1
      READ 2, ION
      IF (ION .EQ. 1HO)  GOTO 200
      IN=1
      GOTO 300
  200 IN=0
  300 CALL FINDNAM
      PRINT 5, N,NC(1)
      GOTO 100
      END
      SUBROUTINE FINDNAM
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
      DIMENSION MSK(3)
      DATA (MASK=37000000000000000000B)
      DATA (MSK=07700000000000000000B,
      00077000000000000000B,00000770000000000000B)
    1 FORMAT (A1)
    2 FORMAT (/5X*NAME OF INSTRUMENT ?*/
      5X*PRINT EACH LETTER WITH /RETURN/*)
    3 FORMAT (3(5X,O20))
  100 PRINT 2
      JM=1
      IC=-5
      ID=1
      N=1
      NN=M/6
      DO 500  K=1,3
      NAM(JM)=0
      IF=0
      DO 400  J=1,3
      READ 1, IQ
      PRINT 10, IQ
   10 FORMAT (5X,O20)
      IF (IQ .NE. 1H )  GOTO 105
      IQ=05500000000000000000B
      GOTO 110
```

```
  105 IQ=IQ .AND. MASK
C     PRINT 10, IQ
      IQ=SHIFT(IQ,-3)
  110 IQ=SHIFT (IQ,IF)
C     PRINT 10, IQ
      NAM(JM)=NAM(JM) ,OR, IQ
C     PRINT 11, NAM(JM)
C  11 FORMAT (5X*NAM = *020)
      IF (N .EQ. 0)  GOTO 350
      N=0
      DO 300 I=1,NN
      GOTO (120,150),ID
  120 IC=IC+6
      GOTO 200
  150 IC=NC(I)
  200 IB=LOC(IC) .AND. MSK(J)
C     PRINT 10, IB
      IF (IQ .NE. IB)  GOTO 300
      N=N+1
      NC(N)=IC
  300 CONTINUE
C     PRINT 12, NN,N,(NC(L),L=1,N)
C  12 FORMAT (5X*NM= *13,3X*N = *13,3X*NC = *613)
      IF ((N .EQ. 1).AND.(IN .EQ. 0)) RETURN
      NN=N
  350 ID=2
      IF=IF-6
  400 CONTINUE
      DO 450  L=1,NN
      NC(L)=NC(L)+1
  450 CONTINUE
      JM=JM+1
  500 CONTINUE
      PRINT 3,(NAM(I),I=1,3)
      RETURN
      END
```

```
PROGRAM   TESFIND

     OLD  (O)   OR NEW  (N)  INSTRUMENT ?
? O

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH /RETURN/
? I
? R
     N =  1      NC =  7
     OLD  (O)   OR NEW  (N)  INSTRUMENT  ?
? O

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? N
? U
? C
? L
?
     01103050000000000000     05516250000000000000     00314550000000000000
     N =  0      NC =  4
     OLD  (O)   OR NEW  (N)  INSTRUMENT ?
? N

     NAME OF INSTRUMENT ?
     PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? N
? U
? C
? L
?
     01103050000000000000     05516250000000000000     00314550000000000000
     N = 0       NC =  4
```

```
        OLD  (O)  OR NEW  (N)   INSTRUMENT ?
? N

        NAME OF INSTRUMENT ?
        PRINT EACH LETTER WITH /RETURN/
? I
? C
? E
?
? D
? E
? T
? E
? C
        01103050000000000000      05504050000000000000      02405030000000000000
        N =  1     NC =  4
```

PROGRAM   CHECKDA

```
      PROGRAM CHECKDA (OUTPUT,INPUT)
    1 FORMAT (5X*LA = -1, 00, 01 ?*)
    2 FORMAT (12)
    3 FORMAT (5X*WEEK,YEAR ?*)
    4 FORMAT (12,1X,12)
    5 FORMAT (5X*LA = *12,3X*LWK = *12,3X*LYR = *12,3X*LZ = *12)
      DATA (IW=32),(IZ=78)
  100 PRINT 1
      READ 2, LA
  200 PRINT 3
      READ 4, LWK,LYR
      IF (LYR .EQ. 0)  GOTO 100
      CALL CHKDATE (IW,IZ,LA,LWK,LYR,LZ)
      PRINT 5, LA,LWK,LYR,LZ
      GOTO 200
      END
      SUBROUTINE CHKDATE (IW,IZ,LA,LWK,LYR,LZ)
C     LA=0   COMPUTED:  CALIBRATION DUE
C     LA=-1 THIS,LAST  YEAR     LA=1  THIS,NEXT  YEAR
    1 FORMAT (5X*CHECK WEEK*)
    2 FORMAT (5X*CHECK YEAR*)
    3 FORMAT (5X*WEEK,  YEAR  (LAST TWO DIGITS OF YEAR ONLY)*)
    4 FORMAT (I2,1X,I2)
  100 IF (LYR .LT. 0)  GOTO 500
      IS=IT=LZ=0
      IF (LA .NE. 0)  GOTO 300
  150 IF (LWK .LE. 52)  GOTO 200
      LWK=LWK-52
      LYR=LYR+1
      GOTO 150
  200 IF (LYR .LE. IZ+1)  GOTO 250
      LWK=52
      LYR=IZ+1
      LZ=1
      RETURN
  250 IF (LYR .GE. IZ)  GOTO 280
      LWK=1
      LYR=IZ
      RETURN
  280 IF (LYR .EQ. IZ)  RETURN
      LZ=1
      RETURN
  300 IF ((LWK.GT.52).OR.(LWK.LT.0))  IS=1
      IF (LYR .EQ. IZ+LA)  GOTO 550
      IF (LA  .EQ. 1 )  GOTO 350
      IF (LYR .NE. IZ)  GOTO 500
      IF (LWK .GT. IW)  450,600
  350 IF (LYR .NE. IZ)  GOTO 500
  400 IF (LWK .LT. IW)  450,600
  450 IS=1
      GOTO 600
```

```
      500 IT=1
          GOTO 600
      550 LZ=1
      600 IF  (IS .EQ. 1)  PRINT 1
          IF  (IT .EQ. 1)  PRINT 2
          IF ((IS.EQ.0).AND.(IT.EQ.0))  RETURN
          PRINT 3
          READ 4, LWK,LYR
          GOTO 100
          END
```

```
PROGRAM   CHECKDA

    LA = -1, 00, 01 ?
? -1
    WEEK,YEAR ?
? 55,99
    CHECK WEEK
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,99
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 55,77
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33, 79
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,76
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,78
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,77
    LA = -1   LWK = 33   LYR = 77   LZ =  1
    WEEK,YEAR ?
? 20,78
    LA = -1   LWK = 20   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 00,00
```

```
    LA = -1, 00, 01 ?
? 00
    WEEK,YEAR ?
? 55,99
    LA =  0   LWK = 52   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 33,99
    LA =  0   LWK = 52   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 55,77
    LA =  0   LWK =  3   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 55,76
    LA =  0   LWK =  1   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 33,78
    LA =  0   LWK = 33   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 33,79
    LA =  0   LWK = 33   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 33,80
    LA =  0   LWK = 52   LYR = 79   LZ =  1
    WEEK,YEAR ?
? 00,00
    LA = -1, 00, 01 ?
? 01
    WEEK,YEAR ?
? 55,99
    CHECK WEEK
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,99
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 55,79
    CHECK WEEK
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,80
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,77
    CHECK YEAR
    WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 10,78
    CHECK WEEK
    WEEK   YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 33,78
    LA =  1   LWK = 33   LYR = 78   LZ =  0
    WEEK,YEAR ?
? 33,79
    LA =  1   LWK = 33   LYR = 79   LZ =  1
```

PROGRAM   TESTCAL

```
      PROGRAM TESTCAL (INPUT,OUTPUT)
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
C    ---  NEEDS SUBROUTINES CHKDATE AND INSTCAL  ---
    1 FORMAT (3(5X,O20))
      DATA ((LOC(I),I=1,6)=)11030500000000000000B,
+          05504050000000000000B,02405030000000000000B,
+          74645400000000000000B,35732400000000000000B,
+          01230000000000000000B)
      DATA (IA=1),(IW=32),(IZ=78)
  100 CALL INSTCAL
      PRINT 1, (LOC(I),I=1,6)
      GOTO 100
      END
      SUBROUTINE INSTCAL
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
      DIMENSION NID(4)
    1 FORMAT (5X*CALIBRATION :*/5X*LAST*11X*(L)*/5X*DUE*12X*(D)*/
+             5X*UPDATE LOGGED  (U)*/5X*CYCLE            (C)*/)
    2 FORMAT (A1)
    3 FORMAT (5X*LOC OLD CALIBRATION BEFORE YOU CAN ENTER NEW ONE*)
    4 FORMAT (5X*WEEK,    YEAR(LAST TWO DIGITS ONLY)*/)
    5 FORMAT (I2,1X,I2)
    6 FORMAT ( 5X*CHECK WEEKS.  (LESS THAN 65)*)
    7 FORMAT (5X*LAST CALIBRATION :*)
    8 FORMAT (5X*WAS UPDATE LOGGED ?*5X*YES  (Y)     NO  (N)*/)
    9 FORMAT (5X*CALIBRATION SHOULD BE DONE :*/
+            12X*AT GENERAL INSPECTION  (00)*/
+            12X*EVERY .. WEEKS         (..)*)
   10 FORMAT (I2)
   11 FORMAT (5X*NEST CALIBRATION IS DUE :*)
      DATA (NCL=00004000000000000000B),(NID=1HL,1HD,1HU,1HC)
  400 PRINT 1
      READ 2, NCA
      DO 410  I=1,4
      IF (NCA .EQ. NID(I))  GOTO 420
  410 CONTINUE
      GOTO 400
```

```
   420 GOTO (430,460,500,530), I
C   ---  LAST CALIBRATION  ---
   430 NCE=LOC(IA+4) .AND. 00004000000000000000B
       IF (NCE .EQ. NCL)  GOTO 440
       PRINT 3
       RETURN
   440 PRINT 7
       PRINT 4
       READ 5, IWK,IYR
       CALL CHKDATE (IW,IZ,-1,IWK,IYR,IWZ)
   451 IWS=SHIFT(IWK,52)
       IYS=SHIFT(IYR,44)
       IE=IA+3
       LOC(IE)=LOC(IE) .AND. 60002000000000000000B
       LOC(IE)=LOC(IE) .OR. IWS .OR. IYS
   452 NCC=LOC(IA+4) .AND. 07600000000000000000B
       NCC=SHIFT(NCC,-52)
       IWE=IWK+NCC
       CALL CHKDATE (IW,IZ,0,IWE,IYR,IZE)
       GOTO 465
C   ---  CALIBRATION DUE  ---
   460 PRINT 11
       PRINT 4
       READ 5, IWE,IYE
       CALL CHKDATE (IW,IZ,1,IWE,IYE,IZE)
   465 IWE=SHIFT(IWE,46)
       IZE=SHIFT(IZE,45)
       IF=IA+4
       LOC(IF)=LOC(IF) .AND. 77600400000000000000B
       LOC(IF)=LOC(IF) .OR. IWE .OR. IZE
       RETURN
C   ---  CALIBRATION UPDATE LOGGED  ---
   500 PRINT 8
       READ 2, NUE
       IG=IA+4
       LOC(IG)=LOC(IG) .AND. 77777000000000000000B
       IF (NUE .EQ. 1HN)  RETURN
       LOC(IG)=LOC(IG) .OR. 00004000000000000000B
       IF (NUE .NE. 1HY)  500,520
   520 RETURN
C   ---  CALIBRATION CYCLE  ---
   530 PRINT 9
       READ 10, NWW
       IF (NWW .LE. 64)  GOTO 540
       PRINT 6
       GOTO 530
   540 NWW=NWW/2
       NWW=SHIFT(NWW,52)
       IH=IA+4
       LOC(IH)=LOC(IH) .AND. 70177400000000000000B
       LOC(IH)=LOC(IH) .OR. NWW
       RETURN
       END
```

```
PROGRAM   TESTCAL

          CALIBRATION :
          LAST              (L)
          DUE               (D)
          UPDATE LOGGES     (U)
          CYCLE             (C)

? L
          LAST CALIBRATION :
          WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 20,77
          0110305000000000000     0550405000000000000     0240503000000000000
          6504640000000000000     3560240000000000000     0123000000000000000
          CALIBRATION :
          LAST              (L)
          DUE               (D)
          UPDATE LOGGED     (U)
          CYCLE             (C)

? D
          NEXT CALIBRATION IS DUE :
          WEEK,   YEAR(LAST TWO DIGITS ONLY)

? 55,99
          CHECK WEEK
          CHECK YEAR
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 20,78
          CHECK WEEK
          WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44,78
          0110305000000000000     0550405000000000000     0240503000000000000
          6504640000000000000     3573040000000000000     0123000000000000000
```

```
    CALIBRATION :
    LAST            (L)
    DUE             (D)
    UPDATE LOGGED   (U)
    CYCLE           (C)

? U
    WAS UPDATE LOGGED ?      YES  (Y)     NO  (N)

? N
    011030500000000000000     055040500000000000000     024050300000000000000
    650464000000000000000     357300000000000000000     012300000000000000000
    CALIBRATION :
    LAST            (L)
    DUE             (D)
    UPDATE LOGGED   (U)
    CYCLE           (C)

? L
    LOG OLD CALIBRATION BEFORE YOU CAN ENTER NEW ONE
    011030500000000000000     055040500000000000000     024050300000000000000
    650464000000000000000     357300000000000000000     012300000000000000000
    CALIBRATION :
    LAST            (L)
    DUE             (D)
    UPDATE LOGGED   (U)
    CYCLE           (C)

? C
    CALIBRATION SHOULD BE DONE :
            AT GENERAL INSPECTION  (00)
            EVERY .. WEEKS         (..)
? 66
    CHECK WEEKS.  (LESS THAN 65)
    CALIBRATION SHOULD BE DONE :
            AT GENERAL INSPECTION  (00)
            EVERY .. WEEKS         (..)
? 62
    011030500000000000000     055040500000000000000     024050300000000000000
    746454000000000000000     377324000000000000000     012300000000000000000
```

```
      PROGRAM TESTREP (INPUT,OUTPUT)
C    ---  NEEDS SUBROUTINES CHKDATE AND INSTREP  ---
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
    1 FORMAT (3(5X,O20))
      DATA ((LOC(I),I=1,6)=01103050000000000000B,
+         05504050000000000000B,02405030000000000000B,
+         74645400000000000000B,35732400000000000000B,
+         01230000000000000000B)
      DATA (IA=1),(IN=0),(IW=32),(IZ=78)
  100 CALL INSTREP
      PRINT 1, (LOC(I),I=1,6)
      GOTO 100
      END
      SUBROUTINE INSTREP
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
    1 FORMAT (/5X*IS INSTRUMENT BACK FROM REPAIR ?*)
    2 FORMAT (/5X*YES  (Y)     NO  (N)*/)
    3 FORMAT (A1)
    4 FORMAT (/5X*WHEN WAS THE INSTRUMENT RETURNED ?*)
    5 FORMAT (/5X*WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?*)
    6 FORMAT (I2,1X,I2)
    7 FORMAT (/5X*CHECK WEEK*)
    9 FORMAT (/5X*FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?*)
   10 FORMAT ( 5X*WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)*)
  550 PRINT 1
      PRINT 2
      READ 3, NRP
      IBR=40000000000000000000B
      IF (NRP .EQ. 1HN)  GOTO 580
C         ---  INSTRUMENT WAS RETURNED  ---
      PRINT 4
      PRINT 10
      READ 6, NRW,NRY
      CALL CHKDATE (IW,IZ,-1,NRW,NRY,NRZ)
      NRW=SHIFT(NRW,53)
      NRY=SHIFT(NRY,45)
       IJ=IA+5
      LOC(IJ)=LOC(IJ) .AND. 37600000000000000000B
      LOC(IJ)=LOC(IJ) .OR. IBR .OR. NRW .OR. NRY
      RETURN
```

```
580 PRINT 5
    READ 6,NSW,NSY
    CALL CHKDATE (IW,IZ,-1,NSW,NSY,NSZ)
    NSW=SHIFT (NSW,46)
    NSZ=SHIFT(NSZ,45)
    PRINT 9
    PRINT 10
    READ 6,NTW,NTY
    CALL CHKDATE (IW,IZ,1,NTW,NTY,NTZ)
    NTW=SHIFT (NTW,53)
    NTZ=SHIFT (NTZ,52)
    IK=IA+5
    LOC(IK)=LOC(IK) .AND. 00000400000000000000B
    LOC(IK)=LOC(IK) .OR. NSW .OR. NSZ .OR. NTW .OR. NTZ
    RETURN
```

PROGRAM TESTREP

```
     IS INSTRUMENT BACK FROM REPAIR ?

     YES  (Y)     NO  (N)

? Y

     WHEN WAS THE INSTRUMENT RETURNED ?
     WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 55,99
     CHECK WEEK
     CHECK YEAR
     WEEK,  YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 40,78
     CHECK WEEK
     WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 30,78
     01103050000000000000     05504050000000000000     02405030000000000000
     74645400000000000000     35732400000000000000     57316000000000000000

     IS INSTRUMENT BACK FROM REPAIR ?

     YES  (Y)     NO  (N)

? N

     WHEN WAS THE INSTRUMENT SENT FOR REPAIR ?
? 55,99
     CHECK WEEK
     CHECK YEAR
     WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 40,78
     CHECK WEEK
     WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 20,78

     FOR WHEN IS THE INSTRUMENT PROMISED TO BE BACK ?
     WEEK,   YEAR(LAST TWO DIGITS OF YEAR ONLY)
? 10,78
     CHECK WEEK
     WEEK,  YEAR (LAST TWO DIGITS OF YEAR ONLY)
? 44:78
     01103050000000000000     05504050000000000000     02405030000000000000
     74645400000000000000     35732400000000000000     26050000000000000000
```

PROGRAM TESTLOG

```
      PROGRAM TESTLOG (INPUT,OUTPUT)
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
    1 FORMAT (/5X*PRINT 6 COMPUTER WORDS IN 3 COLUMNS *
             *OF 20 OCTAL WORDS*/5X*WITH 3 SPACES *
            *STARTING WITH 3 SPACES*)
    2 FORMAT (3(3X,O20))
      DATA (IA=1),(IN=0)
  100 PRINT 1
      READ 2, (LOC(I),I=1,6)
      CALL INSTLOG
      GOTO 100
      END
      SUBROUTINE INSTLOG
      COMMON /A/ IA,IN,IW,IZ,LOC(300),M,NAM(3),N,NC(30)
      DIMENSION NIC(4,2),NID(4),NIE(2),NIF(2),NIG(2),NKA(3)
    1 FORMAT (/5X,3A3/5X*STATUS : *A10,A2/5X*LAST CALIBRATION*
             *  WEEK : *I2,3X*YEAR : *I2/5X*USE : *A10/
             5X*CALIBRATION CYCLE :  EVERY *I2* WEEKS*/
             5X*CALIBRATION DUE :  WEEK : *I2,2X,A4,1X*YEAR*/
             5X*LAST CALIBRATION WAS *A3* ENTERED IN *
             *INSTRUMENT LOG*)
    2 FORMAT ( 5X*SENT FOR REPAIR :  WEEK *I2,2X,A4,1X*YEAR*/
             5X*PROMISED TO BE BACK FROM REPAIR : *
             * WEEK *I2,2X,A4,1X*YEAR*)
    3 FORMAT (5X*LAST REPAIR WAS IN WEEK : *I2,3X*YEAR  *I2)
    4 FORMAT (5X*LAST REPAIR WAS *A3* ENTERED IN INSTRUMENT LOG*)
      DATA (NIC=10HGOOD      ,10HMARGINAL  ,10HNEEDS REPA,
             10HIN REPAIR ,2H  ,2H  ,2HIR,2H  )
      DATA (NID=10HNOT IN USE,10HON C-130   ,10HON P3-42  ,
            10HON P3-43  )
      DATA (NIE=4HTHIS,4HNEXT),(NIF=3HNOT,3H   )
      DATA (NIG=4HTHIS,4HLAST)
  600 IPL=LOC(IA+3)
      IPA=IPL .AND. 60000000000000000000B
      IPA=SHIFT(IPA,-58)
      IPA=IPA .AND. 00000000000000000003B
      IPA=IPA+1
      IPC=IPL .AND. 17600000000000000000B
      IPC=SHIFT(IPC,-52)
      IPY=IPL .AND. 00177400000000000000B
      IPY=SHIFT(IPY,-44)
```

```
      IPM=LOC(IA+4)
      IPU=IPM .AND. 70000000000000000000B
      IPU=SHIFT(IPU,-57)
      IPU=IPU .AND. 00000000000000000007B
      IPU=IPU+1
      IPF=IPM .AND. 07600000000000000000B
      IPF=SHIFT(IPF,-51)
      IPD=IPM .AND. 00176000000000000000B
      IPD=SHIFT(IPD,-47)
      IPG=IPM .AND. 00001000000000000000B
      IPG=SHIFT(IPG,-45)
      IPG=IPG+1
      IPV=IPM .AND. 00000400000000000000B
      IPV=SHIFT(IPV,-44)
      IPV=IPV+1
      IPN=LOC(IA+5)
      IPB=IPN .AND. 40000000000000000000B
      IPB=GHIFT(IPB,-59)
      IPB=IPB .AND. 00000000000000000001B
      IPR=IPN .AND. 37400000000000000000B
      IPR=SHIFT(IPR,-53)
      IPX=IPN .AND. 00200000000000000000B
      IPX=SHIFT(IPX,-52)
      IPX=IPX+1
      IPS=IPN .AND. 00176000000000000000B
      IPS=SHIFT(IPS,-46)
      IPZ=IPN .AND. 00001000000000000000B
      IPZ=SHIFT(IPZ,-45)
      IPZ=IPZ+1
      IPE=IPN .AND. 00000400000000000000B
      IPE=SHIFT(IPE,-44)
      IPE=IPE+1
      IPH=IPN .AND. 00177000000000000000B
      IPH=SHIFT(IPH,-45)
      DO 610  J=1,3
      NKA(J)=SHIFT(LOC(IA+J-1),3)
  610 CONTINUE
      PRINT 1, (NKA(I),I=1,3),NIC(IPA,1),NIC(IPA,2),IPC,IPY,
     +          NID(IPU),IPF,IPD,NIE(IPG),NIF(IPV)
      IF (IPB .EQ. 1)  GOTO 650
      PRINT 2,IPS,NIG(IPZ),IPR,NIE(IPX)
      GOTO 670
  650 PRINT 3, IPR,IPH
      PRINT 4, NIF(IPE)
  670 RETURN
      END
```

PROGRAM   TESTLOG

```
    PRINT 5 COMPUTER WORDS IN 3 COLUMNS OF 20 OCTAL WORDS
    WITH 3 SPACES STARTING WITH 3 SPACES
?   01103050000000000000   05504050000000000000   02405030000000000000
?   74645400000000000000   35732400000000000000   01230000000000000000

    ICE DETEC
    STATUS : IN REPAIR
    LAST CALIBRATION  WEEK : 51    YEAR : 75
    USE : ON P3-43
    CALIBRATION CYCLE :  EVERY 46 WEEKS
    CALIBRATION DUE :  WEEK : 45  THIS YEAR
    LAST CALIBRATION WAS    ENTERED IN INSTRUMENT LOG
    SENT FOR REPAIR :  WEEK 12  THIS YEAR
    PROMISED TO BE BACK FROM REPAIR :  WEEK  2  NEXT YEAR
```