# ELLIOTT 900

Volume   2:   PROGRAMMING INFORMATION

Part     3:   UTILITY PROGRAMS

Section  1:   T22-23: PRODUCE SUM-CHECKED BINARY TAPES

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(Issue 3)

## Chapter 1: INTRODUCTION

### 1.1 Purpose.

To produce a sum-checked binary tape of the present store contents. The locations output may be defined by a data tape: otherwise the whole of the first store-module from location 10 to location 7739 (inclusive) is output.

### 1.2 Summary.

T23 is a loader which is output by T22 at the head of a sum-checked binary tape. The complete output is suitable for input by the initial instructions.

### 1.3 Form of Distribution.

T22 is distributed as a binary tape for input by the initial instructions.

### 1.4 Method of Use.

Two entry-points are provided. On entry at 8179 T22 inputs a data tape which specifies the areas of store to be output (see 2.1 for a description of the data tape.) On entry at 8178 locations 10 to 7739 inclusive are output.

There is no need to clear store before input of the sum-checked binary tape produced.

T22 may run in any store-module and at any program level. T23 must run in the first store-module and at program level 1 but will input program into any store module.

The tape output may be checked by 903 C4.

Chapter 2:      FUNCTIONS

2.1   Data Tape

If T22 is entered at 8179 the areas of store to be output may be specified by the user.   Any number of separate blocks may be specified and any areas of store may be output apart from that occupied by T22-23 (locations 8000 to 8179 inclusive) and locations 0 and 1.

The data tape consists of pairs of absolute addresses, each address terminated by <newline>.   The data tape must be terminated by <halt> (in addition to the final <newline>).   Each pair of addresses defines the first and last addresses of one block to be output.   The addresses are signed integers.   Any address up to   65535 may be specified, however, the program will stop if the address is outside the range of the store actually fitted

Example

In the example below two blocks are output:   8-64 inclusive and 128-512 inclusive.

+8
+64
+128
+512

Ⓗ   (Halt code)

The blocks may be declared in any order.   To output one location, punch its address twice.   <null> <erase> and <carriage return> are ignored wherever they occur on the data tape.   All characters are ignored before the first + and between the first number and the second + .

Chapter 3: METHOD USED

### 3.1 Data Tape Input.

Any character other than a terminator or an ignorable character (as specified in 2.1) is treated as a digit by T22. An impermissible character will cause an undetected error.

### 3.2 Contents of Output Tape.

#### 3.2.1 General.

On input T22 outputs a copy of T23. When T22 is entered this is followed by the blocks in the order specified on the data tape (which is read one block at a time). When all blocks have been output a false directory and two checksums are output and the program waits.

#### 3.2.2 Directories.

At the beginning of a block and after output of a zero location a directory is output. A false directory of 0 is output before the two checksums.

All directories are defined by the addition of +128 to the first character: apart from this bit, the address is output as an 18-bit word.

#### 3.2.3 Output of an 18-bit Word.

An 18-bit word is output as three consecutive characters which are not parity-checked.

(i)     bits 18-15 of the word
(ii)    bits 14-8 of the word
(iii)   bits 7 - 1 of the word

Consecutive locations are output as consecutive groups of three characters.

#### 3.2.4 Checksums.

Checksums are formed during output.

The first is formed by addition of all the words output, ignoring overflow. The second is the sum of all the directories output, again ignoring overflow. They are output as consecutive 18-bit words as the final item of the output tape.

## Chapter 4:   STORE USED

T22 uses locations 8046 - 8179 inclusive.

T23 uses locations 8130 - 8179 inclusive.

## Chapter 5:   TIME TAKEN

T22 and T23 operate at the speed of the paper tape punch and reader respectively.

## Chapter 6:   OPERATING INSTRUCTIONS

Input T22 under the initial instructions (8181)   (1111111110101)

To dump the whole store (10 to 7739)   enter at 8179   (1111111110010)

To dump selected blocks of store   enter at 8179 and
load data   (1111111110011)

To input binary tape   enter the initial instructions (8181)

## Chapter 7:   ERROR INDICATION

If the sum-checked test fails on input, tape is output continuously.