

MODEL 629
DUAL MAGNETIC
TAPE CASSETTE
READER/
RECORDER

REFERENCE
MANUAL

WANG

**MODEL 629
DUAL MAGNETIC
TAPE CASSETTE
READER/RECORDER**

REFERENCE MANUAL

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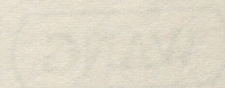
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MODEL 889
DUAL MAGNETIC
TAPE CASSETTE
READER RECORDER

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TO OUR CUSTOMERS

Congratulations on your decision to purchase the Wang Dual Tape Cassette Drive. With the addition of the Dual Tape Drive to your calculating system, you have exercised one of the many options offered by the complete selection of peripheral equipment available with the Wang 600 Series programmable calculators.

Wang Laboratories is committed to a program of equipment and services to support the needs of our customers. We maintain an extensive library of programs. Our service organization is readily available to assure that the equipment operates at its maximum capability.

This manual provides operating instructions for the Model 629 Dual Tape Drive when used with the 600 Series Calculator; an understanding of the operations of the 600 is suggested before proceeding with the study of this manual.

Wang Laboratories is dedicated to manufacturing the finest and most complete calculating system. If you have any additional questions, contact your local Wang sales office, or use the Customer Comment Form on the last page of the manual.

TO OUR CUSTOMERS

Representations on your letter to purchase the West Side Electric Drive with the addition of the West Side Drive to your existing system, you have received one of the most important pieces of information in the history of the industry.

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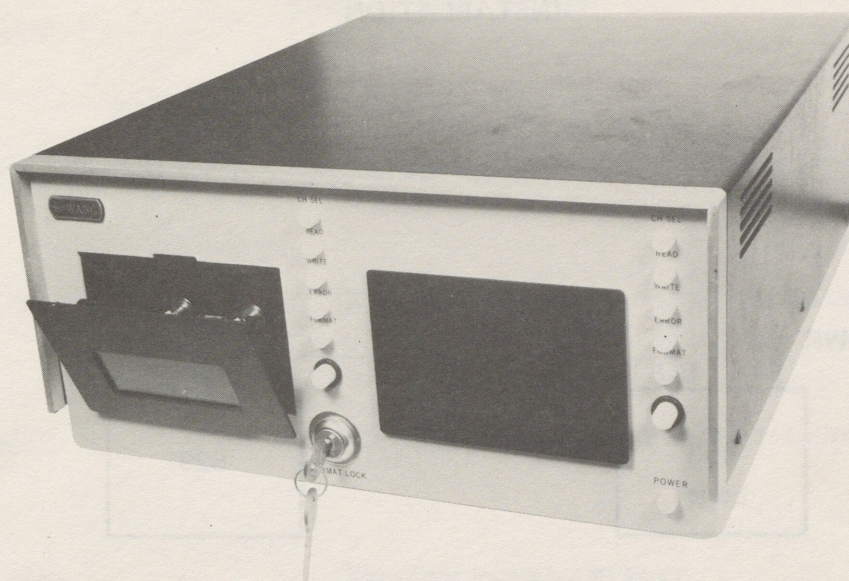
West Side Electric is a company of equipment and service to the industry. We are a company of equipment and service to the industry. We are a company of equipment and service to the industry.

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98	ROUTINE
99	ROUTINE
100	ROUTINE



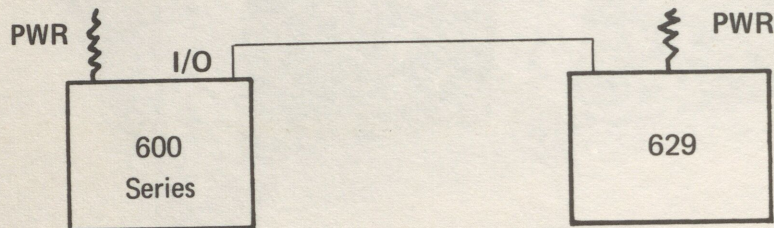
INTRODUCTION

The Wang Model 629 Dual Magnetic Tape Cassette System incorporates the extensive storage capacity and high access speed long associated with our tape cassettes used on other models of our products.

The Model 629 contains two separately controllable magnetic tape cassette units for recording data from, or reading data to, the memory of the 600-2, 600-6, 600-14 calculator. Data can be searched in either a forward or reverse direction at a rate of 500 program steps per second. A count of each block on the tape is maintained in the electronics of the Model 629, and a specific block number is automatically designated. This feature makes the system a high-speed, random-access, data retrieval facility, allowing the operator to locate and search data quickly.

Recording or reading data is accomplished by selecting the proper cassette unit, placing the block number in REG 000, and the beginning step number of the calculator in REG 001. The use of either the READ or WRITE command for the proper size block causes the transfer of information at a rate of 500 steps per second.

INSTALLATION



600/629 Interconnecting Diagram

The 600 Series calculators recognize each tape cassette in the 629 unit to be two separate devices, each of which is assigned a specific address. Since the calculator can address up to 16 individual devices, a maximum of eight 629 Dual Tape Cassette Units can be accessed by a single 600 Series calculator. The 629 unit can be used as part of a system with combinations of the 608-2, 2 External Core Unit, and the 610-1 Disk Drive. Any of these combinations requires the use of T-connectors.

- | | | |
|------------------|---|---|
| ON/OFF SWITCH | — | Facing the 629 unit, the ON/OFF switch is located on the lower left-hand corner of the rear panel. |
| POWER CORD | | Located on the rear panel of the 629. The power cord plugs into any standard outlet (115 V, 60 Hz). Plug in the 629. |
| CONNECTOR CABLES | — | This connector, also located on the rear panel of the 629, plugs into the I/O receptacle at the back of the calculator. Attach the cable. |

TURN ON PROCEDURE:

1. Power "ON" 629.
2. Power "ON" 600 series calculator.
3. Prime the 600 series calculator.

FRONT PANEL OF 629

LIGHT INDICATORS

CH. SEL.



CHANNEL SELECTOR — This light indicates which cassette is being used.

READ



READ — This light indicates when reading is taking place.

WRITE



WRITE — This light indicates when writing is taking place.

ERROR



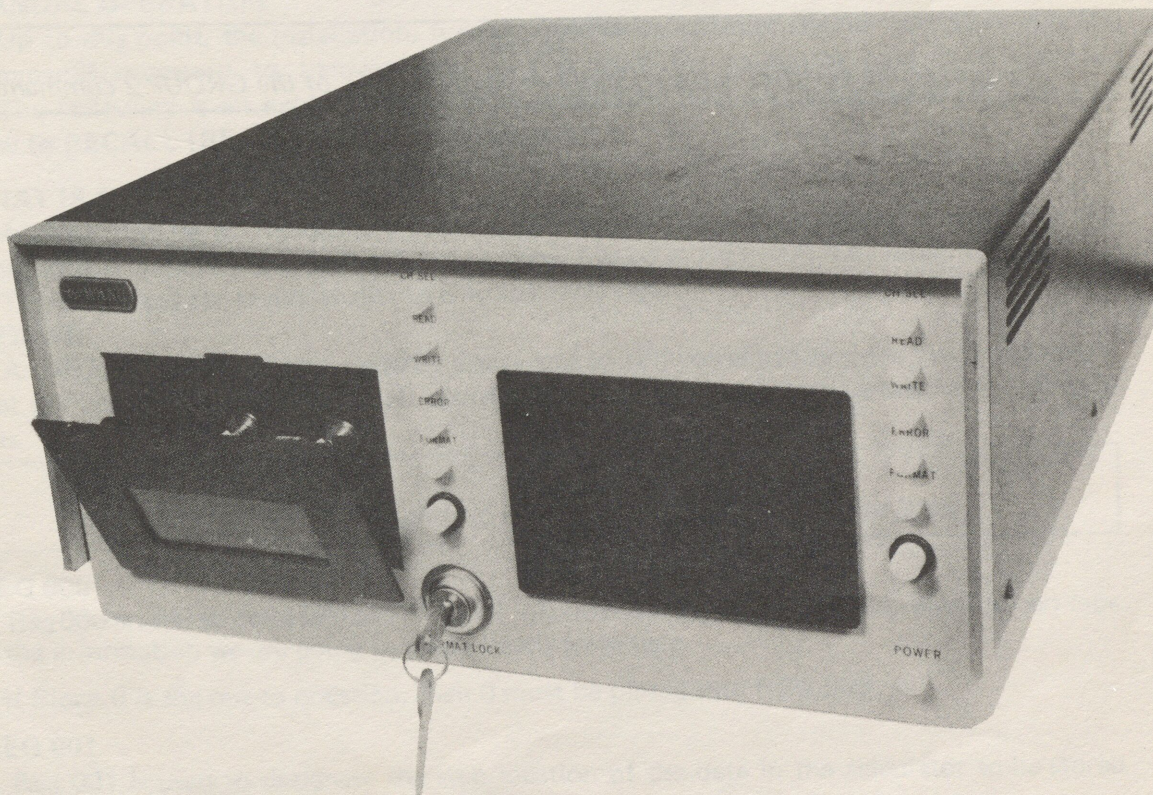
ERROR — This light indicates an error.

FORMAT

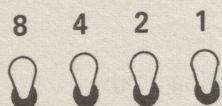


FORMAT

- This light indicates that the tape is being preformatted with timing marks.
This light is on *continuously* when the format circuit is ready to format. When the actual formatting is taking place, the light flashes at one-half second intervals.



629 TAPE SELECTOR SWITCHES



These toggle switches are located on the back panel of the 629. They are used to select the tape in which data transfer (reading or writing) is to take place.

In order for the calculator to operate with the 629, the 629 must be assigned an address, since a 600 calculator can drive a maximum of 16 individual external memory devices. The address of the 629 is selected by four toggle switches on the rear panel. A two-step command (GROUP 2, 00 XX) is required to select the 629 where XX corresponds to the setting of the toggle switches at the rear of the 629.

If the GROUP 2, 00 XX command does not match the setting of the toggle switches, the 629 fails to function and the keyboard locks. If the GROUP 2, 00 XX command matches the setting of the switches, the 629 is then accessible through the calculator.

XX can be 00-15, as long as the number does not correspond with any other peripheral device being used with the calculator.

SETTING OF THE CHANNEL SELECTOR SWITCHES

If the XX of the GROUP 2 command is 00, all switches down.

If the XX of the GROUP 2 command is 01, 1 switch up.

If the XX of the GROUP 2 command is 02, 2 switch up.

If the XX of the GROUP 2 command is 03, 1,2 switches up.

If the XX of the GROUP 2 command is 15, all switches up.

NOTE:

The sum of the switches in the up position equals the XX of the GROUP 2 command.

629 DATA TRANSFER COMMANDS

Twelve transfer commands are assigned to the 629 to STORE (WRITE) or RECALL (READ) information via the calculator. Information can be transferred in 8, 16, 32, 64, 128 or 256 steps at a time.

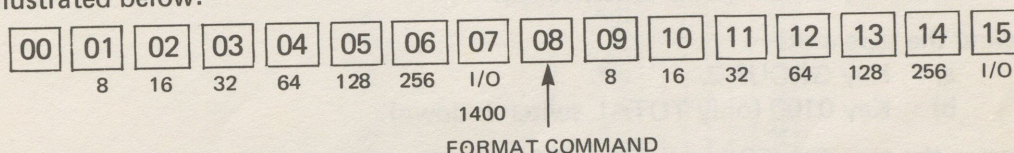
Two-step commands where the I/O key is the first step to transfer (READ) program steps to the 600 from the 629:

1301	8 program steps	1304	64 program steps
1302	16 program steps	1305	128 program steps
1303	32 program steps	1306	256 program steps

Two-step commands where the I/O key is the first step to TRANSFER (WRITE) program steps to the 629 from the 600:

1308	FORMAT COMMAND	1312	64 program steps
1309	8 program steps	1313	128 program steps
1310	16 program steps	1314	256 program steps
1311	32 program steps		

For ease of operation, the function strip on the top of the keyboard can be labeled as illustrated below:



The 13 part of the command is generated by the SP + DIV Selector Switches. The remainder is generated by the special registers.

MANUAL OPERATION

Up to this point, the installation, turn on procedure, channel selector operation and the commands necessary to transfer data to and from the calculator have been covered.

The following is an explanation of how to STORE (WRITE) information on tape and how to RECALL (READ) information from tape.

WHAT IS A BLOCK?

A block can be 8, 16, 32, 64, 128, or 256 steps of data. You designate where, on the tape, data is to be written with a block number placed in REG 000 (i.e., block 0, 1, 2, 3, ...

The block number is always placed into the REG 000.

REWIND

A GROUP 2, 0100, (total switches down register 00) command rewinds the tape cassette that has been addressed. The block counter resets to zero and the tape head automatically lifts.

NOTE:

Both the PRIME and REWIND commands raise the tape head.

REG 000

Reg 000 is used to designate the block of information we are going to store (write) on tape or the information we are going to recall (read) from tape.

If Block 0 is the one in question, then 0 must be placed into REG 000.

REG 001

Reg 001 is used to designate the step location of the data in the calculator to be stored (written) from the 600 to be recalled (written).

600-6/600-14 EXAMPLE OF DATA TRANSFER UNDER MANUAL CONTROL

To read and write data from the 600(600-6, 600-14) to the 629, the following steps are recommended:

1. Select the tape unit and address it.
2. Rewind the tape unit.
3. Format the tape by 450 blocks, if a 150 foot tape (225 blocks if a 75 foot tape).
4. Write data from the 600(600-6, 600-14) onto Block 20 of the 629.
5. Read data from block 20 of the 629 to the calculator.

Details for the above steps are:

1. To select the tape unit and address it:

DUAL TAPE 629	{	a) Turn on the 629. b) Place system cassette in left side. c) Turn on Format Lock. d) Set all switches down in left side. (Select tape as unit 0000.) e) Connect 629 with 600.
CALCULATOR 600	{	f) Key PRIME. g) Key GROUP 2. h) Key 00 (all special switches up).
2. To rewind the tape unit:
 - a) Key GROUP 2.
 - b) Key 0100 (only TOTAL switch is down).
3. To format the tape by 450 blocks, if a 150 foot tape (225 blocks if a 75 foot tape):
Use the software offered on page 10.
4. To write data from the 600(600-6, 600-14) onto Block 20 of the 629:

a) Store 100 in Reg 020. b) Store 101 in Reg 021. c) Store 102 in Reg 022. d) Store 103 in Reg 023.	}	32 steps
e) Store 0 in Reg 024, 025, 026, 027. f) Key 20. g) Store in Reg 000. h) Key 1784(600-14), or 760 (600-6). i) Store in Reg 001. j) Key I/O. k) Key 1311.		
5. To read data from Block 20 of the 629 to the calculator:
 - a) Key 20.
 - b) Store in Reg 100.
 - c) Key 728(600-6) or 1752(600-14).
 - d) Store in Reg 001.
 - e) Key I/O.
 - f) Key 1303.
 - g) Recall 024, display reads: 100
 - h) Recall 025, display reads: 101
 - i) Recall 026, display reads: 102
 - j) Recall 027, display reads: 103

600-2 312-PROGRAM STEPS/55 DATA REGISTERS

REGISTER NUMBER		REGISTER NUMBER	
00		27	0 2 2 3
01		28	0 2 1 5
02		29	0 2 0 7
03		30	0 1 9 9
04		31	0 1 9 1
05		32	0 1 8 3
06		33	0 1 7 5
07		34	0 1 6 7
08		35	0 1 5 9
09		36	0 1 5 1
10		37	0 1 4 3
11		38	0 1 3 5
12		39	0 1 2 7
13		40	0 1 1 9
14		41	0 1 1 1
15		42	0 1 0 3
		43	0 0 9 5
16	0 3 1 1	44	0 0 8 7
17	0 3 0 3	45	0 0 7 9
18	0 2 9 5	46	0 0 7 1
19	0 2 8 7	47	0 0 6 3
20	0 2 7 9	48	0 0 5 5
21	0 2 7 1	49	0 0 4 7
22	0 2 6 3	50	0 0 3 9
23	0 2 5 5	51	0 0 3 1
24	0 2 4 7	52	0 0 2 3
25	0 2 3 9	53	0 0 1 5
26	0 2 3 1	54	0 0 0 7
			0 0 0 5
			0 0 0 4
			0 0 0 3
			0 0 0 2
			0 0 0 1
			0 0 0 0

PROGRAM STEP NO.

600-6
824-PROGRAM STEPS/119 DATA REGISTERS

REGISTER NUMBER	REGISTER NUMBER	REGISTER NUMBER	REGISTER NUMBER
00	29	59	89
01	30	60	90
02	31	61	91
03	32	62	92
04	33	63	93
05	34	64	94
06	35	65	95
07	36	66	96
08	37	67	97
09	38	68	98
10	39	69	99
11	40	70	100
12	41	71	101
13	42	72	102
14	43	73	103
15	44	74	104
	45	75	105
16	46	76	106
17	47	77	107
18	48	78	108
19	49	79	109
20	50	80	110
21	51	81	111
22	52	82	112
23	53	83	113
24	54	84	114
25	55	85	115
26	56	86	116
27	57	87	117
28	58	88	118

REGISTER NUMBER	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGISTER NUMBER	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
REGISTER NUMBER	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
REGISTER NUMBER	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
REGISTER NUMBER	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154
REGISTER NUMBER	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185
REGISTER NUMBER	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216
REGISTER NUMBER	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	
PROGRAM STEP NO.																															

629 SOFTWARE FORMAT PROGRAM

This program formats 450 blocks as a tape cassette, establishes timing marks and also clears the entire tape of all data.

Format Lock key must be on.

```
STEP 0000  1010 or 0505*  
            MARK  
            0  
            0  
            ST 00  
            ST 01  
            GR 2  
            00XX  
            GR2  
            0100  
            MK  
            1  
            I/O  
            1308  
            1  
            + 00  
            4  
            5  
            0  
            ALPHA  
            JIF 0  
            SEARCH  
            1  
            GR 2  
            0100  
            STOP  
            END PROGRAM
```

OPERATING INSTRUCTIONS

1. Key in above program (LEARN Mode).
2. RUN Mode.
3. Format Key on.
4. PRIME.
5. SEARCH 0.
6. Display reads: 450.

*This code can be anything except 0000 or 1515.

CHANGING BLOCKS IN THE MIDDLE OF A TAPE

The design of the 629 with its pre-formatted tape characteristics allows the updating of any block on a random basis. The 629 records timing marks automatically as the initialization point for any data that is either written in or read from the tape. This enables a user to locate data anywhere on the tape at any time.

There is one rule that must be followed — when updating a block of information, the block being updated must be the same size or larger — **NEVER UPDATE A BLOCK THAT RESULTS IN FEWER STEPS.**

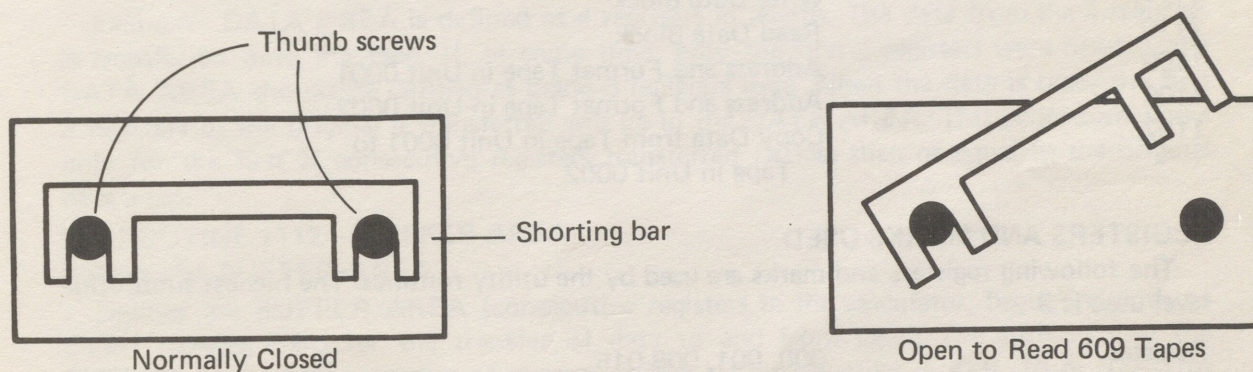
Therefore, an original block of 64 steps may be updated or replaced by another block of 64, 128 or 256 steps, but not by a smaller block size.

CONVERTING 609 CASSETTE TO 629 CASSETTE

The 629 has an option of reading a cassette that had been previously recorded on a 609. The procedure for this operation is:

The 629 has a shorting bar located on the rear panel, which is normally in the closed position. To read a tape that was previously recorded on the 609, the shorting bar must be opened by loosening one of the thumb screws that keeps it closed. Lifting the bar disables the timing mark recognition circuitry for any READ command. The 629 now processes all data on the tape as information data when any READ command is issued. Any user presently using a 609 can easily transcribe a 609 tape to a pre-formatted tape without the use of a 609.

Sequential Transfer is recommended.



ERRORS

There are two types of errors that can be made while using a tape cassette:

SOFT ERROR — This type of error is a one-time error, to correct the error the user re-reads the tape and error is eliminated.

Causes of this type of ERROR —

- Noise
- Dirt on Tape
- Power Surge

HARD ERROR — after the initial read command has been given, if an error occurs, re-read the tape three times, if the error has not been corrected after the third re-read, it is considered a Hard Error. Rewriting the block may correct the error, however, after rewriting the block and the error has not been cleared, a new tape should be used.

629 UTILITY ROUTINES

INTRODUCTION

The 629 utility routines provide an easy system to store and retrieve data from the dual cassette device 629. Restrictions explained in the reference part of the manual must be adhered to while using these routines.

The utility routines are stored in the tape, entitled "629 UTILITY ROUTINES", provided with this manual. The routines on the tape are identified with subroutines 1107-1115. They are then read into the memory of the calculator, and accessed by switching the f(x) key down and keying the appropriate SPECIAL FUNCTION KEY.

Example: To use subroutine 1110

- a) Only f(x) key is down
- b) Key SHIFT
- c) Key 10

The following are the utility routines available on the tape and the subroutine numbers assigned to them:

<u>Subroutine</u>	<u>Utility Routines</u>
1115	Address and Rewind Tape in Unit 0001
1114	Address and Rewind Tape in Unit 0002
1113	Data Area
1112	Buffer Area
1111	Write Data Block
1110	Read Data Block
1109	Address and Format Tape in Unit 0001
1108	Address and Format Tape in Unit 0002
1107	Copy Data from Tape in Unit 0001 to Tape in Unit 0002

REGISTERS AND MARKS USED

The following registers and marks are used by the utility routines. The highest subroutine level used is 3.

Register	000, 001, 009-015
Marks	1510-1515
Subroutine Marks	1104-1115

UTILITY ROUTINES

SUBROUTINE 1115 – ADDRESS AND REWIND TAPE UNIT 0001

Addresses (identifies the tape unit to be used in the transfer) and rewinds the tape in unit 0001.

SUBROUTINE 1114 – ADDRESS AND REWIND TAPE IN UNIT 0002

Addresses and rewinds the tape in unit 0002.

SUBROUTINE 1113 – DATA AREA

Defines the DATA AREA (consecutive registers in the calculator in which data to be written to or to be read from tape is stored).

The LENGTH of the DATA AREA (the number of consecutive registers in the data area) *cannot* exceed the LENGTH of the BUFFER AREA.

To define the DATA AREA:

- i) Place the number of the first (lowest) data register of the DATA AREA in the display.
- ii) f(x) Key down, Key SHIFT.
- iii) Key **13**.
- iv) Place the LENGTH (in registers) of the DATA AREA in the display.
- v) Key GO.

The DATA AREA remains defined in this way until changed by the use of this subroutine. If desired, the DATA AREA can be redefined before data is read from tape. The new area must not be longer than the previous area.

Example: DATA AREA is defined as 4 registers in length. The data from the 4 registers is transferred onto the tape. If, at some time, only the first 3 registers were needed, the DATA AREA should be defined as being 3 registers long. When the data is read, the first 3 registers of the original 4 transferred will be in the DATA AREA. This procedure works only for the first X consecutive registers transferred (X less than or equal to the original data area).

SUBROUTINE 1112 – BUFFER AREA

Defines the BUFFER AREA

Defines the BUFFER AREA (consecutive registers in the calculator, beginning with an EVEN register, used for the transfer of data to and from tape). The LENGTH of the BUFFER AREA is the number of registers in the buffer (must be 2, 4, 8, 16 or 32). This also determines the length of the blocks to be written on or to be read from the tape.

Since data registers are transferred to and from the tape in groups of 2, 4, 8, 16 or 32, the BUFFER AREA is necessary because the DATA AREA can be smaller than the number of registers transferred.

i.e., if the DATA AREA is 15 registers in length, 16 registers must be transferred.

To define the BUFFER AREA

- i) Place the number of the first (lowest) register (must be even) of the BUFFER AREA in the display.
- ii) Place the LENGTH of the BUFFER AREA (in registers 2, 4, 8, 16 or 32) in the display.
- iii) f(x) Key Down, Key SHIFT.
- iv) Key **12**.
- v) Key GO.

The BUFFER AREA remains defined in this way until changed by the use of this subroutine.

SUBROUTINE 1111 – WRITE BLOCK (DATA)

Transfers data from the DATA AREA (defined by Subroutine 1113) to the BUFFER AREA. This data is then written onto a block of the tape (in the 629 unit) last addressed.

To write a Block of Data:

- i) The BUFFER AND DATA AREAS must be defined (Subroutines 1112 and 1113).
- ii) Place the block number where the data is to be written in the display.
- iii) Use Subroutine 1111.

SUBROUTINE 1110 – READ BLOCK (DATA)

Reads into the BUFFER AREA data written on the block from the 629 unit last addressed. Data is then transferred to the DATA AREA (defined by Subroutine 1113).

To Read a Block of Data:

- i) The BUFFER and DATA AREAS must be defined. (Subroutines 1112 and 1113).
- ii) Place the block number where the data is to be read in the display.
- iii) Use Subroutine 1110.

SUBROUTINE 1109 – FORMAT TAPE IN UNIT 0001

Addresses, formats and rewinds the tape in unit 0002 with either 225 blocks (75 foot tape) or 450 blocks (150 foot tape). Each block is 256 bytes long.

To Format the Tape:

- i) Place a '0' in the display if the tape is 75 feet long (225 blocks) or a '1' in the display if the tape is 150 feet long (450 blocks).
- ii) Use Subroutine 1109.

SUBROUTINE 1108 – FORMAT TAPE IN UNIT 0002

Addresses, formats and rewinds the tape in unit 0002 with either 225 blocks (75 foot tape) or 450 blocks (150 foot tape). Each block is 256 bytes long.

To Format the Tape:

- i) Place an '0' in the display if the tape is 75 feet long (225 blocks) or a '1' in the display if the tape is 150 feet long (450 blocks).

SUBROUTINE 1107 – COPY UNIT 0001 to 0002

Copies blocks from one tape to another. To copy n blocks from one tape to another tape means to read the data from tape 1, starting at block 0 and ending with block n-1 and to write them onto tape 2, also starting at block 0 and ending with block n-1. The copy is restricted to having the same length of data in each block.

To copy n blocks from unit 0001 to unit 0002:

- i) Place the tape to be copied from in tape unit 0001.
- ii) Place the new tape in tape unit 0002.
- iii) Place the n (# of blocks to be copied) in the display.
- iv) f(x) key down, key SHIFT.
- v) Key 07.
- vi) Place the length (16, 32, 64, 128, 256) in display.
- vii) Key GO.

OPERATING INSTRUCTIONS FOR UTILITY ROUTINES

These routines are written for the unit whose addresses are set to 0001 and 0002.

Write, onto any random block number of the tape in units 0001 and 0002 of the 629, the data in registers 020, 021, and 022 of the calculator. Read this data into registers 003, 004, and 005 of the calculator from the random block chosen in unit 0001, and into registers 006 and 007 of the calculator from the random block in unit 0002. The Buffer Area is 4 registers long (registers 030, 031, 032, 033).

The address of the left unit of the 629 should be set to 0001 and the address of the right unit should be set to 0002.

GENERAL OPERATING PROCEDURE

1. Place a tape cassette in each unit of the 629.
2. Load the program tape titled "629 Utility Routines" into the calculator and touch the VERIFY PROGRAM key.

3. Store data in calculator registers.

Only f(x) key is down for steps 4 through 17.

4. Define the Data Area.
Key number of first (lowest) register of the data area to the display.
Touch SHIFT.
Touch key **13** .
Key length (in registers) of the data area to the display.
Key **GO** .

The buffer area must be either 2, 4, 8, 16, or 32 registers in length.

EXAMPLE

1. Place a tape cassette in each unit of the 629.
2. Load the program tape titled "629 Utility Routines" into the calculator and touch the VERIFY PROGRAM key.
Read VERIFY PROGRAM number:
+000000004641 in the display.

3. Store data in calculator registers:
100 in register 020.
101 in register 021.
102 in register 022.

Store zeros in registers 003, 004, 005, 006, 007 and 008.

4. Define the Data Area.
Key **2** **0** to the display.
Key SHIFT.
Key **13** .
Key **3** to the display.

Key **GO** .

Defines the data area as starting at register 020 and being 3 registers in length.

5. Define Buffer Area.
Key number of first register of the buffer area (must be even) to the display.
Touch SHIFT.
Touch key **12** .
Key length of buffer area to the display.
Key **GO** .

6. Address unit 0001 and rewind tape.
Touch SHIFT.
Touch key **15** .

5. Define Buffer Area.
Key **3** **0** to the display.

Key SHIFT.
Key **12** .
Key **4** to the display.
Key **GO** .
Defines buffer area as starting at register 030 and being 4 registers in length.

6. Address unit 0001 and rewind tape.
Key SHIFT.
Touch key **15** .
Addresses unit and rewinds tape.

Data is written on and read off tape in block lengths equal to the buffer area length. The same block length should be used throughout a tape. Therefore, the buffer area length should remain constant.

7. Format unit 0001 and rewind tape.
Key **0** to display for 75 ft. tape (225 blocks).
Key **1** to display for 150 ft. tape (450 blocks).
Touch SHIFT.
Touch key **09** .

8. Write data on tape in unit 0001.
Key block number to the display.
Touch SHIFT.
Touch key **11** .

9. Address unit 0002 and rewind tape.
Touch SHIFT.
Touch key **14** .

7. Format unit 0001 and rewind tape.
Key **0** to the display.

Key SHIFT.
Touch key **09** .
Formats unit with 225 blocks and rewinds tape.

8. Write data on tape in unit 0001.
Key **1** **0** to the display.
Key SHIFT.
Touch key **11** .
Transfers data from data area to buffer area and writes data on block 10 of the tape in the left unit.

9. Address unit 0002 and rewind tape.
Key SHIFT.
Addresses right unit and rewinds tape.

10. Format unit 0002 and rewind tape.
Key **0** to the display for 75 ft. tape
(225 blocks).
Key **1** to the display for 150 ft. tape
(450 blocks).
Touch SHIFT.
Touch key **08** .

11. Write data on tape in unit 0002.
Key block number to the display.
Touch SHIFT.
Touch key **11** .

12. Re-define data area.
Key number of first register of the data
area to the display.
Touch SHIFT.
Touch key **13** .
Key length of data area to the display.
Key **GO** .

13. Address unit 0001 and rewind tape.
Touch SHIFT.
Touch key **15** .

14. Read data from tape in unit 0001.
Key block number to the display.
Touch SHIFT.
Touch key **10** .

10. Format unit 0002 and rewind tape.
Key **0** to the display.

Touch SHIFT.
Touch key **08** .
Format unit 0002 and rewind tape.
Key **0** to the display.

11. Write data on tape in unit 0002.
Key **8** to the display.
Key SHIFT.
Touch key **11** .
Transfers data from data area to
buffer area and writes data on
block 8 of the tape in the right unit.

12. Re-define data area.
Key **3** to the display.

Key SHIFT.
Key **13** .
Key **3** to the display.
Key **GO** .
Defines data area as starting at
register 003 and being 3 registers
in length.

13. Address unit 0001 and rewind tape.
Key SHIFT.
Touch key **15** .
Addresses left unit and rewinds
tape.

14. Read data from tape in unit 0001.
Key **10** to the display.
Key SHIFT.
Touch key **10** .
Reads data from block 10 of the
tape in the left unit to the buffer
area and transfers data to data area.

15. Re-define data area.
Key number of first register of the data
Touch SHIFT.
Touch key **13** .
Key length of the data area to the
display.
Key **GO** .

16. Address unit 0002 and rewind tape.
Touch SHIFT.
Touch key **14** .

17. Read data from tape in unit 0002.
Key block number to the display.
Touch SHIFT.
Touch key **10** .

18. Recall registers and check data.

15. Re-define data area.
Key **6** to the display.
Key SHIFT.
Key **13** .
Key **2** to the display.

Key **GO**
Defines the data area as starting at
register 006 and being 2 registers
in length.

16. Address unit 0002 and rewind tape.
Key SHIFT.
Touch key **14** .
Addresses right unit and rewinds tape.

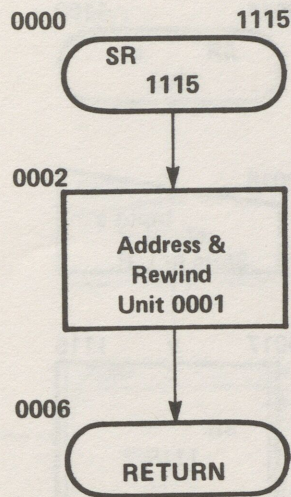
17. Read data from tape in unit 0002.
Key **8** to the display.
Key SHIFT.
Touch key **10** .
Transfers data from block 8 of the
tape in the right unit to the buffer
area and transfers data to data area.

18. Recall registers and check data.
Registers 003 and 006
Read: **100.000000000**
Registers 004 and 007
Read: **101.000000000**
Register 005
Read: **102.000000000**
Register 008
Read: **.000000000000**

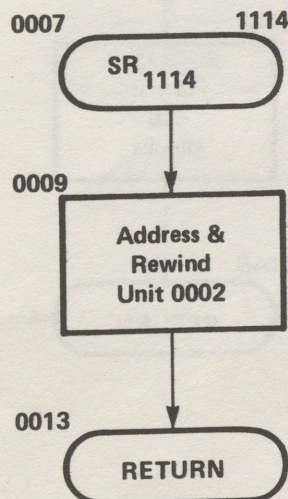
NOTE:

For unit 0002 the data area was reduced in size from 3 to 2 registers. Only the first two registers of the original three transferred to tape are in the new data area.

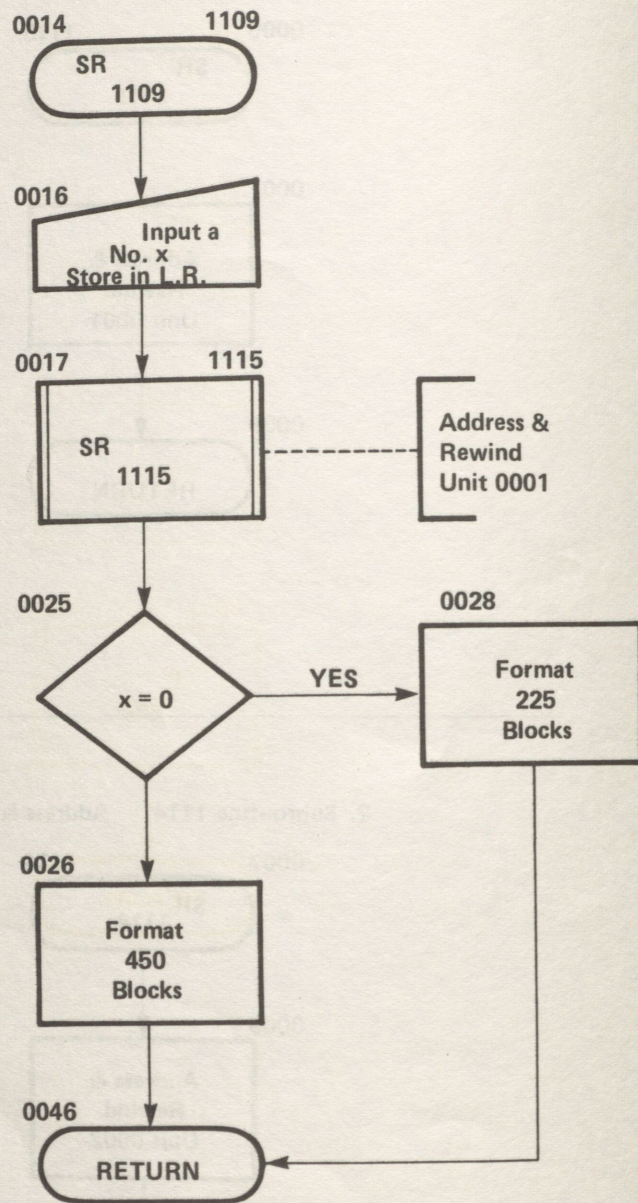
1. Subroutine 1115: Address & Rewind Unit 0001



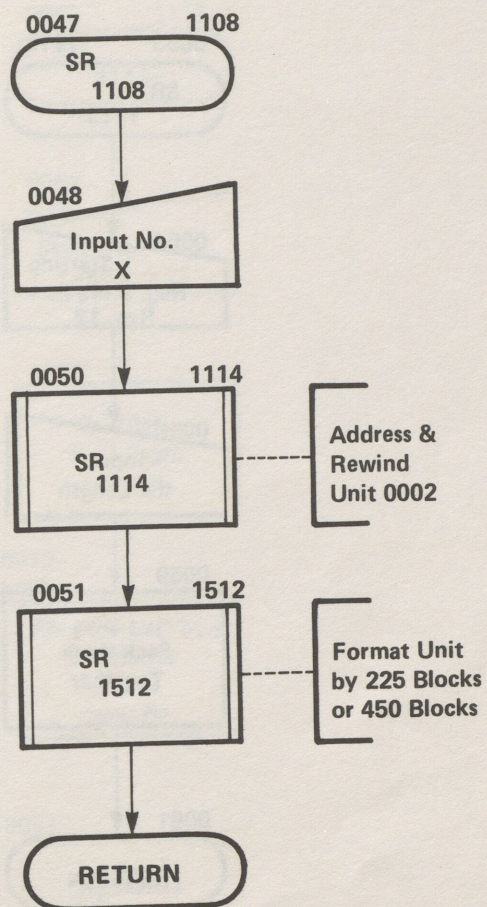
2. Subroutine 1114: Address & Rewind Unit 0002



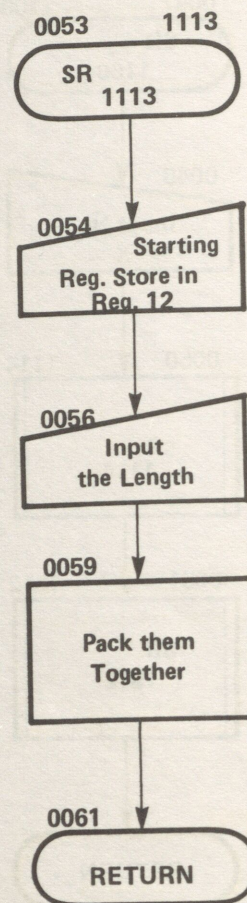
3. Subroutine 1109: Format Unit 0001



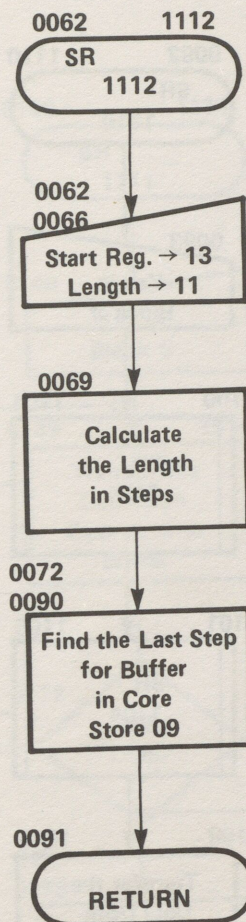
4. Subroutine 1108: Format Unit 0002



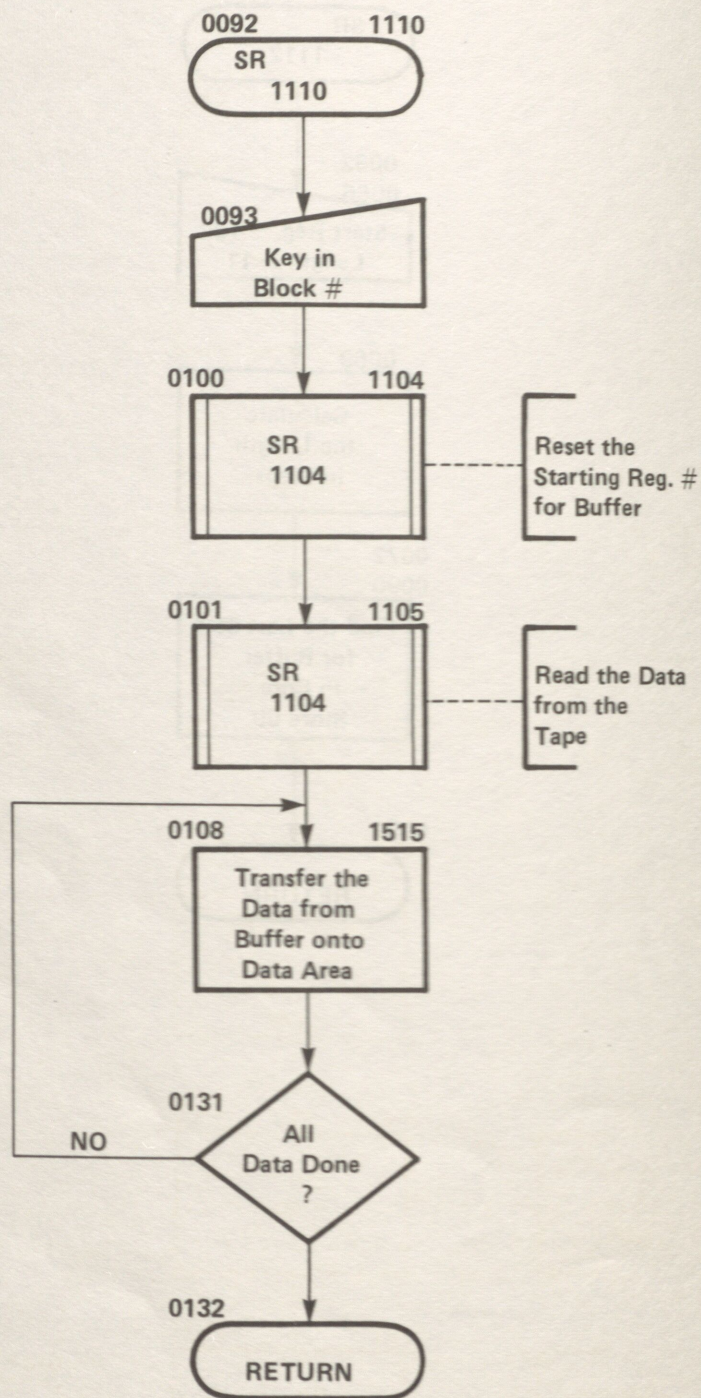
5. Subroutine 1113: Define Data Area



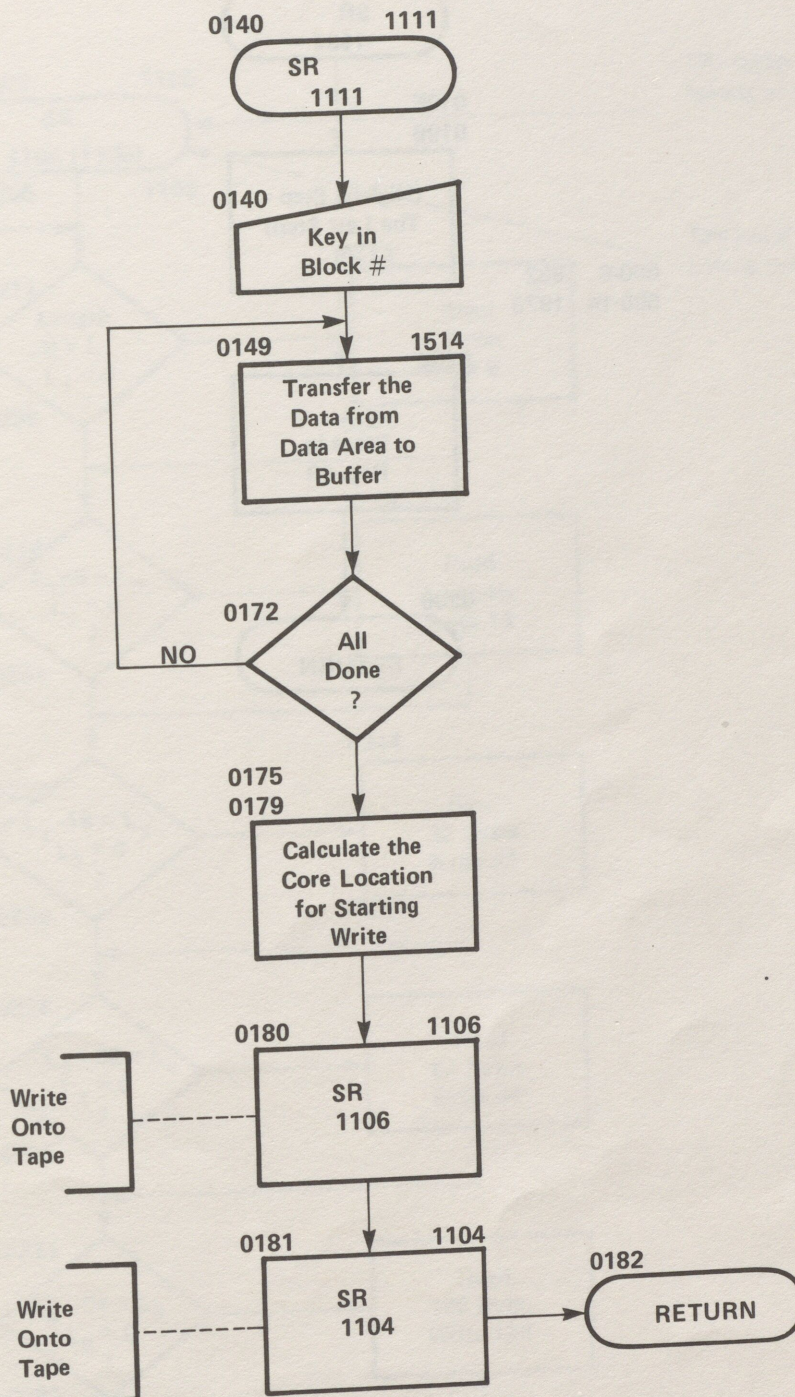
6. Subroutine 1112: Define Buffer Area



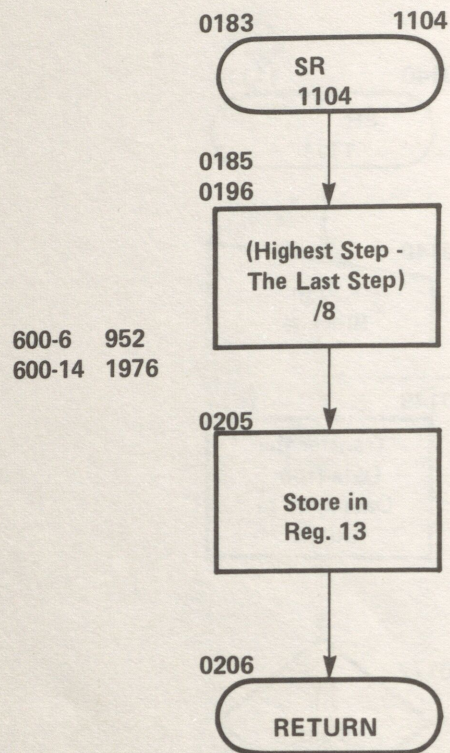
7. Subroutine 1110: Read Block



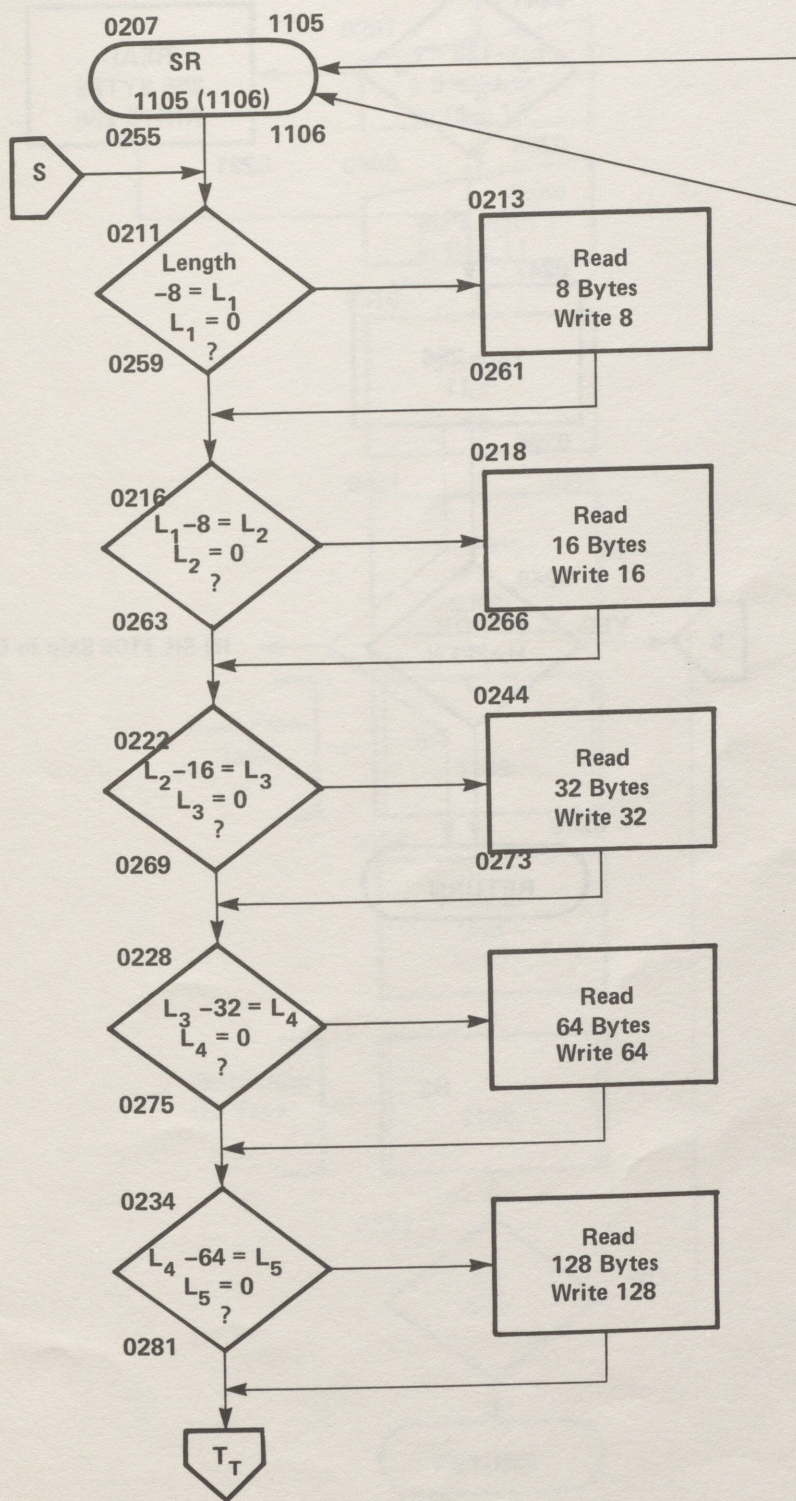
8. Subroutine 1111: Write Block



9. Subroutine 1104: Reset the Starting Reg. for Buffer

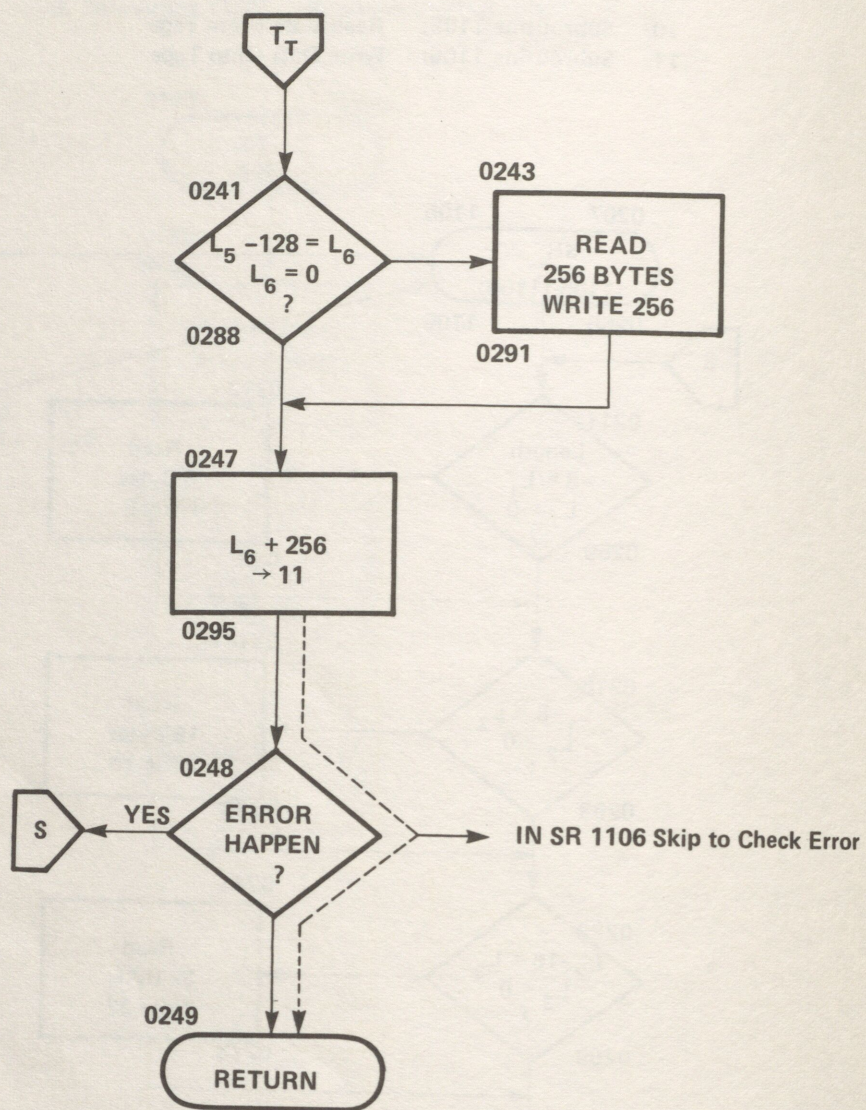


10. Subroutine 1105: Read Data From Tape
 11. Subroutine 1106: Write Data Onto Tape

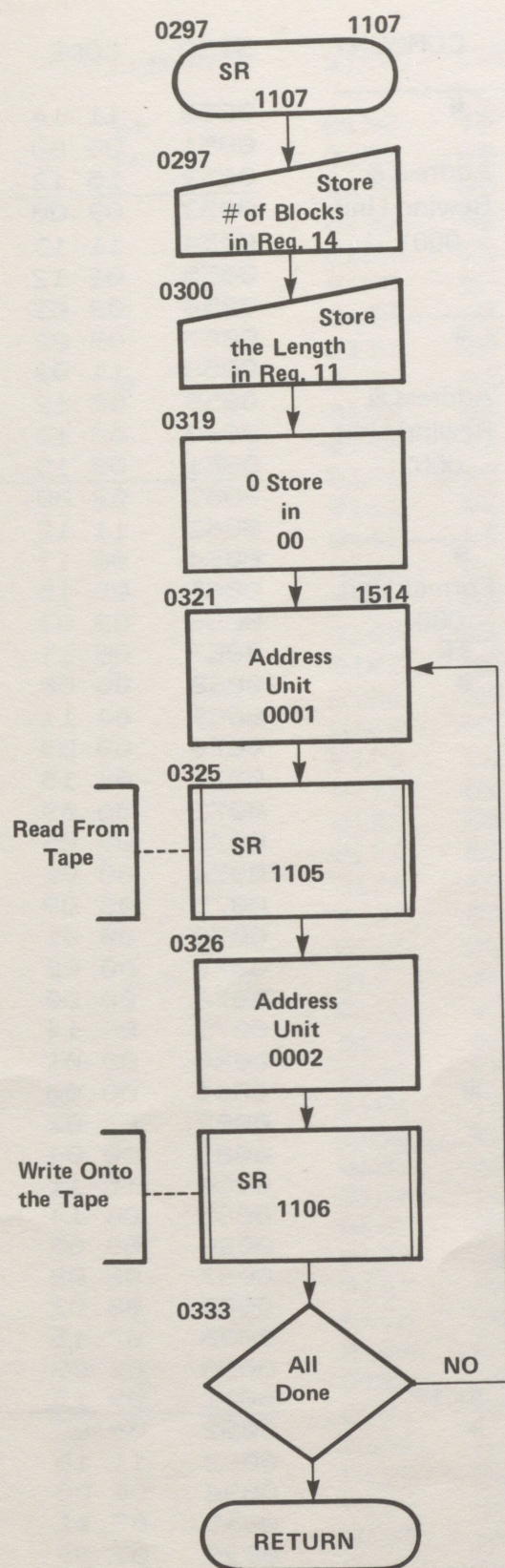


The upper No. on symbols
belong to SR 1105

The lower No. on symbols
belong to SR 1106



12. Subroutine 1107: Copy the Tape



STEP	CODE	KEY	COMMENT	STEP	CODE	KEY	COMMENT
0000	09 00	MARK	#	0050	11 14	1114	
0001	11 15	1115		0051	08 00	SEARCH	SR
0002	15 14	GROUP 2	Address &	0052	15 12	1512	*
0003	00 01	1	Rewind Unit	0053	09 00	MARK	#
0004	15 14	GROUP 2	0001	0054	11 13	1113	Define Data
0005	01 00	T 00		0055	06 12	ST 12	Area
0006	09 15	RETURN		0056	09 03	STOP	
0007	09 00	MARK	#	0057	09 02	ALPHA	
0008	11 14	1114		0058	11 02	1102	D. P.
0009	15 14	GROUP 2	Address &	0059	02 12	+ 12	
0010	00 02	2	Rewind Unit	0060	06 10	ST 10	
0011	15 14	GROUP 2	0002	0061	09 15	RETURN	
0012	01 00	T 00		0062	09 00	MARK	#
0013	09 15	RETURN		0063	11 12	1112	
0014	09 00	MARK	#	0064	06 13	ST 13	Define Buffer
0015	11 09	1109	Format Unit	0065	06 15	ST 15	Area
0016	06 15	ST 15	0001	0066	09 03	STOP	
0017	11 15	1115	SR	0067	06 11	ST 11	
0018	09 00	MARK	#	0068	00 08	8	
0019	15 12	1512		0069	04 11	X 11	
0020	00 02	2		0070	00 08	8	
0021	00 02	2		0071	04 15	X 15	
0022	00 05	5		0072	00 09	9	
0023	06 14	ST 14		0073	00 05	5	
0024	07 15	RE 15		0074	00 02	2	
0025	08 04	JUMP IF 0		0075	06 09	ST 09	
0026	07 14	RE 14		0076	00 01	1	
0027	08 03	GO		0077	00 02	2	
0028	02 14	+ 14		0078	00 00	0	
0029	00 00	0		0079	06 14	ST 14	
0030	06 00	ST 00		0080	00 01	1	
0031	09 00	MARK	#	0081	00 00	0	
0032	15 13	GROUP 1		0082	00 02	2	
0033	00 00	0		0083	00 04	4	
0034	06 01	ST 01		0084	15 11	INDIR	
0035	15 02	I/O		0085	06 14	ST 14	
0036	13 08	WRITE 1		0086	09 05	JUMP ERROR	
0037	00 01	1		0087	02 09	+ 09	
0038	02 00	+ 00		0088	08 03	GO	
0039	07 14	RE 14		0089	07 15	RE 15	
0040	09 02	ALPHA		0090	03 09	- 09	
0041	08 04	JUMP IF 0	SKIP	0091	09 15	RETURN	
0042	08 00	SEARCH	*	0092	09 00	MARK	#
0043	15 13	GROUP 1		0093	11 10	1110	
0044	15 14	GROUP 2		0094	06 00	ST 00	Read Block
0045	01 00	T 00		0095	07 11	RE 11	
0046	09 15	RETURN		0096	03 09	- 09	
0047	09 00	MARK	#	0097	06 01	ST 01	
0048	11 08	1108	Format Unit	0098	07 11	RE 11	
0049	06 15	ST 15	0002	0099	02 09	+ 09	

STEP	CODE	KEY	COMMENT	STEP	CODE	KEY	COMMENT
0100	11 04	1104	SR	0150	15 14	GROUP 2	
0101	11 05	1105	SR	0151	00 01	1	
0102	07 10	RE 10		0152	02 12	+ 12	
0103	06 12	ST 12		0153	06 15	ST 15	
0104	00 01	1		0154	15 11	INDIR	
0105	03 12	- 12		0155	07 15	RE 15	
0106	00 01	1		0156	06 14	ST 14	
0107	03 13	- 13		0157	00 01	1	
0108	09 00	MARK	#	0158	02 13	+ 13	
0109	15 15	1515		0159	06 15	ST 15	
0110	00 01	1		0160	07 14	RE 14	
0111	02 13	+ 13		0161	15 11	INDIR	
0112	06 15	ST 15		0162	06 15	ST 15	
0113	15 11	INDIR		0163	07 12	RE 12	
0114	07 15	RE 15		0164	09 12	INT X	
0115	06 14	ST 14		0165	06 15	ST 15	
0116	00 01	1		0166	03 12	- 12	
0117	02 12	+ 12		0167	09 02	ALPHA	
0118	06 15	ST 15		0168	10 02	1002	D. P.
0119	07 14	RE 14		0169	06 14	ST 14	
0120	15 11	INDIR		0170	00 01	1	
0121	06 15	ST 15		0171	03 14	- 14	
0122	07 12	RE 12		0172	08 04	JUMP IF 0	
0123	09 12	INT X		0173	08 00	SEARCH	*
0124	06 15	ST 15		0174	15 10	1510	
0125	03 12	- 12		0175	07 11	RE 11	
0126	09 02	ALPHA		0176	03 09	- 09	
0127	10 02	1002	D. P.	0177	06 01	ST 01	
0128	06 14	ST 14		0178	07 11	RE 11	
0129	00 01	1		0179	02 09	+ 09	
0130	03 14	- 14		0180	11 06	1106	SR
0131	09 04	JUMP IF -0		0181	11 04	1104	SR
0132	09 15	RETURN		0182	09 15	RETURN	
0133	08 03	GO		0183	09 00	MARK	#
0134	09 02	ALPHA		0184	11 04	1104	Reset the
0135	11 02	1102	D. P.	0185	00 09	9	Starting Reg.
0136	02 15	+ 15		0186	00 05	5	for Buffer
0137	06 12	ST 12		0187	00 02	2	
0138	08 00	SEARCH	*	0188	06 13	ST 13	
0139	15 15	1515		0189	00 01	1	
0140	09 00	MARK	#	0190	00 02	2	
0141	11 11	1111	Write Block	0191	00 00	0	
0142	06 00	ST 00		0192	06 14	ST 14	
0143	07 10	RE 10		0193	00 01	1	
0144	06 12	ST 12		0194	00 00	0	
0145	00 01	1		0195	00 02	2	
0146	03 12	- 12		0196	00 04	4	
0147	00 01	1		0197	15 11	INDIR	
0148	03 13	- 13		0198	06 14	ST 14	
0149	09 00	MARK	#	0199	09 05	JUMP ERROR	

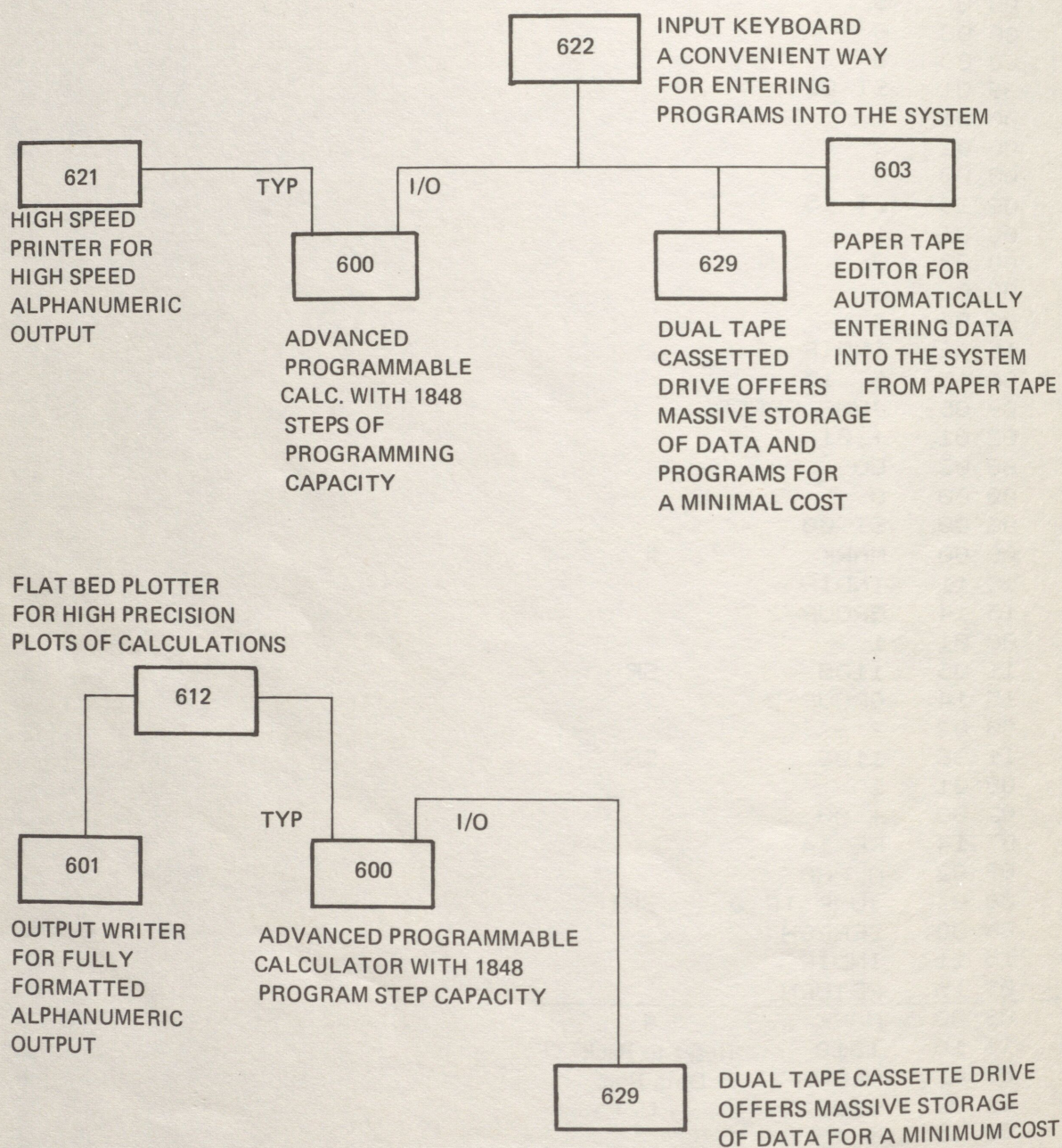
STEP	CODE	KEY	COMMENT	STEP	CODE	KEY	COMMENT
0200	02 13	+ 13		0250	08 03	GO	
0201	08 03	GO		0251	00 09	9	
0202	07 09	RE 09		0252	08 15	1/X	
0203	03 13	- 13		0253	09 03	STOP	
0204	00 08	8		0254	11 05	1105	SR
0205	05 13	/ 13		0255	09 00	MARK	#
0206	09 15	RETURN		0256	11 06	1106	Write Onto
0207	09 00	MARK	#	0257	00 08	8	the Tape
0208	11 05	1105		0258	03 11	- 11	
0209	00 08	8	Read from	0259	09 04	JUMP IF -0	
0210	03 11	- 11	the Tape	0260	15 02	I/O	
0211	09 04	JUMP IF -0		0261	13 09	WRITE 8	
0212	15 02	I/O		0262	00 08	8	
0213	13 01	READ 8		0263	03 11	- 11	
0214	00 08	8		0264	09 04	JUMP IF -0	
0215	03 11	- 11		0265	15 02	I/O	
0216	09 04	JUMP IF -0		0266	13 10	WRITE 16	
0217	15 02	I/O		0267	00 01	1	
0218	13 02	READ 16		0268	00 06	6	
0219	00 01	1		0269	03 11	- 11	
0220	00 06	6		0270	09 04	JUMP IF -0	
0221	03 11	- 11		0271	15 02	I/O	
0222	09 04	JUMP IF -0		0272	13 11	WRITE 32	
0223	15 02	I/O		0273	00 03	3	
0224	13 03	READ 32		0274	00 02	2	
0225	00 03	3		0275	03 11	- 11	
0226	00 02	2		0276	09 04	JUMP IF -0	
0227	03 11	- 11		0277	15 02	I/O	
0228	09 04	JUMP IF -0		0278	13 12	WRITE 64	
0229	15 02	I/O		0279	00 06	6	
0230	13 04	READ 64		0280	00 04	4	
0231	00 06	6		0281	03 11	- 11	
0232	00 04	4		0282	09 04	JUMP IF -0	
0233	03 11	- 11		0283	15 02	I/O	
0234	09 04	JUMP IF -0		0284	13 13	WRITE 128	
0235	15 02	I/O		0285	00 01	1	
0236	13 05	READ 128		0286	00 02	2	
0237	00 01	1		0287	00 08	8	
0238	00 02	2		0288	03 11	- 11	
0239	00 08	8		0289	09 04	JUMP IF -0	
0240	03 11	- 11		0290	15 02	I/O	
0241	09 04	JUMP IF -0		0291	13 14	WRITE 256	
0242	15 02	I/O		0292	00 02	2	
0243	13 06	READ 256		0293	00 05	5	
0244	00 02	2		0294	00 06	6	
0245	00 05	5		0295	02 11	+ 11	
0246	00 06	6		0296	09 15	RETURN	#
0247	02 11	+ 11		0297	09 00	MARK	
0248	09 05	JUMP ERROR		0298	11 07	1107	
0249	09 15	RETURN		0299	06 14	ST 14	Copy the Tape

PROGRAM TITLE: 629 Utility

STEP	CODE	KEY	COMMENT	STEP	CODE	KEY	COMMENT
0300	09 03	STOP					
0301	06 11	ST 11					
0302	00 05	5					
0303	00 06	6					
0304	00 08	8					
0305	06 01	ST 01					
0306	00 01	1					
0307	00 02	2					
0308	00 00	0					
0309	06 15	ST 15					
0310	00 01	1					
0311	00 00	0					
0312	00 02	2					
0313	00 04	4					
0314	15 11	INDIR					
0315	06 15	ST 15					
0316	09 05	JUMP ERROR					
0317	02 01	+ 01					
0318	08 03	GO					
0319	00 00	0					
0320	06 00	ST 00					
0321	09 00	MARK	#				
0322	15 11	INDIR					
0323	15 14	GROUP 2					
0324	00 01	1					
0325	11 05	1105	SR				
0326	15 14	GROUP 2					
0327	00 02	2					
0328	11 06	1106	SR				
0329	00 01	1					
0330	02 00	+ 00					
0331	07 14	RE 14					
0332	09 02	ALPHA					
0333	08 04	JUMP IF 0	SKIP				
0334	08 00	SEARCH	*				
0335	15 11	INDIR					
0336	09 15	RETURN					
0337	09 00	MARK	#				
0338	15 10	1510	Reset to Pack				
0339	09 02	ALPHA	Data Reg.				
0340	11 02	1102	D. P.				
0341	02 15	+ 15					
0342	06 12	ST 12					
0343	08 00	SEARCH	*				
0344	15 14	GROUP 2					
0345	09 14	END PROG					

629 CONFIGURATIONS

The 629 Dual Tape Cassette Drive adds a flexible storage device for Wang Calculating systems in which other Wang peripheral equipment can be used. Two of the many possible configurations are shown here, examples of how the Wang Calculating system can be expanded as your needs increase.



For more information on these and other configurations of Wang Calculating Systems, look in your Yellow Pages for the local Wang sales office; or call us at (617) 851-4111.

609 DUAL TAPE CASSETTE OPERATION

The 609 Dual Tape Cassette operates in exactly the same manner as the 629 Dual Tape Cassette. There are however, a few differences between the two units.

The 0800 command on the 609 instructs the system to transfer one byte (step). The 629 cannot transfer one byte (step) of data.

The 0808 command transfers one byte (step) on the 609. The 0808 command for the 629 is the format command for pre-formatting a tape.

The 609 has no tape pre-formatting capabilities.

629 SPECIFICATIONS

1. Power Requirement: 115 VAC 60 Hz or 230 VAC 50 Hz
2. Connecting Cable: 6 ft. (2 meter) with I/O connector to 600/700
3. Operating Environment:
Temp: 50° F to 104° F
(10° C to 40° C)
Humidity: 20% to 80% relative humidity.
4. Recording Speed: 7.5"/sec.
Search Speed: 7.5"/sec.
Rewind Speed: 90"/sec.
Recording Method: NRZ Dual Track
Recording Density: 300 Flux Change per inch
Inter-Recording Gap: .8"
5. Size: 6" length (15.2 cm)
14" width (35.6 cm)
16" depth (40.6 cm)
6. Weight: 34 lbs. (15.4 kg)

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