

A J A X
T A P E M A I N T E N A N C E S Y S T E M

1.0 CONTENTS

	<u>Page</u>
1.0 CONTENTS	
2.0 GENERAL	1
3.0 INOUT COMMAND	2
4.0 PROGRAM CORRECTION COMMANDS	3
4.1 DELE COMMAND	3
4.2 COPY COMMAND	3
4.3 REPL COMMAND	3
4.4 FILE COMMAND	3
4.5 ALTER COMMAND	4
5.0 SERVICE COMMANDS (NO OUTPUT TAPE)	5
5.1 PRINT COMMAND	5
5.2 PUNCH COMMAND	5
5.3 LIST COMMAND	5
6.0 MISCELLANEOUS COMMANDS	6
6.1 STOP COMMAND	6
6.2 SORS COMMAND	6
6.3 HDR COMMAND	6
7.0 EXAMPLES	7
8.0 IMPORTANT NOTES ON AJAX	10
9.0 AJAX COMMAND LIST	11
9.1 SKIP	11
10.0 AJAX STOPS	13

2.0 G E N E R A L

AJAX is an integrated set of service routines providing the functions necessary to create and maintain Tape Libraries, Systems Libraries, and Master Instruction Tapes.

AJAX is essentially a tape to tape utility program with command cards from the reader directing its services. Programs (object and source) may be filed, replaced, deleted, printed, copied, listed, altered and punched.

AJAX will not accept object cards to be filed or replaced from the reader nor will it punch object cards from tape. These functions are provided by the Object Program Updating System, OPUS.

Tape formats are those described under 1050 System Tape formats.

Card formats are those of the 1050 PAL Assembly System.

There are four types of command cards:

- Type 1. I/O Command - INOUT describes the major input and output peripherals.
- Type 2. Program Correction Commands - DELE, FILE, REPL, COPY, ALTER.
- Type 3. Service Commands - PRINT, LIST, PUNCH.
- Type 4. Miscellaneous Commands - STOP, SORS, HDR.

3.0 I N O U T C O M M A N D

FORM:

OP	OPERANDS
INOUT	p1, p2, p3

where: p1 specifies the input device
 C for reader
 0 through 9 for appropriate tape unit

 p2 specifies the output device
 C for punch
 P for printer
 0 through 9 for appropriate tape unit

 p3 blank or L

If L, AJAX will produce a two block 17000g tape loader as the first two blocks on the output tape. This function performed only if p2 names a tape unit.

NOTE:

The following parameter combinations on the INOUT card are not acceptable:

 C,C T,T (if both name same unit).

An INOUT card must precede all other command cards.

4.0 PROGRAM CORRECTION COMMANDS

4.1 DELE COMMAND

FORM:	<table border="1"><thead><tr><th>OP</th><th>OPERANDS</th></tr></thead><tbody><tr><td>DELE</td><td>p1, p2</td></tr></tbody></table>	OP	OPERANDS	DELE	p1, p2
OP	OPERANDS				
DELE	p1, p2				

where: p1 = program to be deleted (maximum 4 character ID).

p2 = blank or SKIP. If SKIP, all programs from present position of input tape to p1 will be deleted, otherwise, they will be copied.

NOTE:

The SKIP parameter is discussed at the end of this document.

4.2 COPY COMMAND

FORM:	<table border="1"><thead><tr><th>OP</th><th>OPERANDS</th></tr></thead><tbody><tr><td>COPY</td><td>p1, p2</td></tr></tbody></table>	OP	OPERANDS	COPY	p1, p2
OP	OPERANDS				
COPY	p1, p2				

where: p1 = program to be copied (maximum 4 character ID).

p2 = blank or SKIP. If SKIP, all programs from present position of input tape to p1 will be deleted, otherwise, they will be copied.

4.3 REPL COMMAND

FORM:	<table border="1"><thead><tr><th>OP</th><th>OPERANDS</th></tr></thead><tbody><tr><td>REPL or REPL(T)</td><td>p1, p2 (source only) p1, p2 (source or object from tape)</td></tr></tbody></table>	OP	OPERANDS	REPL or REPL(T)	p1, p2 (source only) p1, p2 (source or object from tape)
OP	OPERANDS				
REPL or REPL(T)	p1, p2 (source only) p1, p2 (source or object from tape)				

where: p1 = program to be replaced (maximum 4 character ID).

p2 = blank or SKIP. If SKIP, all programs from present position of input tape to p1 will be deleted, otherwise, they will be copied.

(T) = names tape unit (0-9) containing replacement program.

4.4 FILE COMMAND

FORM:	<table border="1"><thead><tr><th>OP</th><th>OPERANDS</th></tr></thead><tbody><tr><td>FILE or FILE(T)</td><td>p1, p2 (source only) p1, p2 (source or object from tape)</td></tr></tbody></table>	OP	OPERANDS	FILE or FILE(T)	p1, p2 (source only) p1, p2 (source or object from tape)
OP	OPERANDS				
FILE or FILE(T)	p1, p2 (source only) p1, p2 (source or object from tape)				

where: p1 = program after which the filed program is to be placed, unless it is to be the first program on tape or if it is to be filed immediately after a program just operated on, in which case p1 must equal "HERE".

p2 = blank or SKIP as in REPL.

(T) = names tape unit (0-9) containing program to be filed.

4.5 ALTER COMMAND

FORM:

OP	OPERAND
ALTER	p1, p2

where: p1 = program to be altered (maximum 4 character ID).

p2 = blank or SKIP as in REPL.

This card must precede a SORS or HDR correction command and is used only in conjunction with them.

5.0 SERVICE COMMANDS* (NO OUTPUT TAPE)

5.1 PRINT COMMAND

FORM:

OP	OPERAND
PRINT	p1, p2

where: p1 = program to be printed (maximum 4 character ID).

p2 = blank or SKIP, if blank AJAX will print from present position of tape to p1 inclusive.

p2 of INOUT card must = P.

5.2 PUNCH COMMAND

FORM:

OP	OPERAND
PUNCH	p1, p2

where: p1 = program to be punched.

p2 = blank or SKIP, if blank AJAX will punch from present position of tape to p1 inclusive.

p2 of INOUT card must = C.

5.3 LIST COMMAND

FORM:

OP	OPERAND
LIST	

This command has no parameters and will LIST each program header with the sentinel that is contained on the input tape.

p2 of INOUT card must = P.

NOTE:

The SKIP PARAMETER should not be used on the STOP CARD following service commands.

*Not to be used with Program Correction Commands, or intermixed with each other since the INOUT Command prohibits use of the printer and punch simultaneously.

6.0 MISCELLANEOUS COMMANDS

6.1 STOP COMMAND

FORM:

OP	OPERAND
STOP	p1, p2

This command is always the last command to AJAX and must always be present.

If p1 is blank, AJAX will copy the remainder of the input to the output as preset by the INOUT card except in the case of PRINT and PUNCH.

If p1 is "SKIP", AJAX will terminate the output at its present location.
p2 may be blank or "END".

If p2 is "END", AJAX will reload the Executive System from Tape Unit 0 when its functions are complete after depressing the START button at the successful completion STOP. If p2 is blank, AJAX will re-initialize upon depressing the START button.

The following two commands must be preceded by an ALTER card.

6.2 SORS COMMAND

FORM:

OP	OPERAND
SORS	n1, n2, n3

This command is used to make individual source card corrections by deleting, adding, or replacing individual lines of code.

where: n1 = page-line-insert number where correction is to start. If n2 = 0, source cards which follow will be inserted after n1.

n2 = page-line-insert number of last card of deletion. AJAX will delete from n1 to n2 inclusive when n2 ≠ 0.

n3 = number of source card corrections to be added which immediately follow this card (0 to 9).

NOTE:

1. n1 = n2 if replacing one card.
2. If more than 9 consecutive source cards are being inserted, a second SORS command is required for each additional set of 9 insertions, where n1 must equal "HERE", n2 must be \emptyset , and n3 the number of cards.

6.3 HDR COMMAND

FORM:

OP	OPERAND
HDR	

This command is used to replace a source or object header card. It must be immediately followed by the new header card.

7.0 E X A M P L E S

The following are examples of AJAX commands where

(T) = tape unit

*RRRR = 4 character program ID

SERVICE	FUNCTION	COMMAND NEEDED
PRINTING	Print Entire Tape	1. INOUT (T), P 2. STOP
	Print One Program	1. INOUT (T), P 2. PRINT *RRRR, SKIP 3. STOP
	Print Several Programs	1. INOUT (T), P 2. PRINT *RRRR, SKIP 3. PRINT *RRRR, SKIP 4. STOP
	List Programs from Tape	1. INOUT (T), P 2. LIST 3. STOP
PUNCHING (Source only)	Punch Entire Tape (Will SKIP Object Program)	1. INOUT (T), C 2. STOP
	Punch One Program	1. INOUT (T), C 2. PUNCH *RRRR, SKIP 3. STOP
	Punch Several Programs	1. INOUT (T), C 2. PUNCH *RRRR, SKIP 3. PUNCH *RRRR, SKIP 4. STOP SKIP
CARD TO TAPE (Source only)	Card to Tape	1. INOUT C, (T) 2. STOP
	Card to Tape, Tape Loader to be added	1. INOUT C, (T), L 2. STOP 3. Cards follow in reader. } 99. Z Tape Sentinel
COPYING	Copy Tape with Loader	1. INOUT (T), (T), L 2. STOP
	Copy Tape without Loader	1. INOUT (T), (T) 2. STOP
	Copy one program without Loader	1. INOUT (T), (T) 2. COPY *RRRR, SKIP 3. STOP SKIP

SERVICE	FUNCTION	COMMAND NEEDED
COPYING (Cont.)	Copy all Programs from Card #2 to Card #3 inclusive with Tape Loader	1. INOUT (T), (T), L 2. COPY *RRRR, SKIP 3. COPY *RRRR 4. STOP SKIP
FILING	File one program from cards (Source Only) and copy remainder of input	1. INOUT (T), (T) 2. FILE *RRRR (Program before the one filed) 3. Program to be FILED 99. STOP
	File one program from Tape Unit 4 (Source or Object) at the present position of the tape and copy remainder of input.	1. INOUT (T), (T) 2. FILE4 HERE 3. STOP
	File one program from Tape Unit 3 and terminate output at that point on tape.	1. INOUT (T), (T) 2. FILE3 *RRRR (Program before the one filed) 3. STOP SKIP
REPLACING	REPL one program from cards (Source Only) and copy remainder of tape.	1. INOUT (T), (T) 2. REPL *RRRR 3. Program Replacement 99. STOP
	REPL one program from Tape Unit 4 (Source or Object) and copy all of input.	1. INOUT (T), (T) 2. REPL4 *RRRR 3. STOP
	REPL one program from Tape Unit 6 and another from Tape Unit 5 and copy all of input.	1. INOUT (T), (T) 2. REPL6 *RRRR 3. REPL5 *RRRR 4. STOP
	REPL two programs from Tape Unit 7 and copy all of input. Write Loader on front of tape.	1. INOUT (T), (T), L 2. REPL7 *RRRR 3. REPL7 *RRRR 4. STOP
DELETING	DELETE one program, Loader to output tape.	1. INOUT (T), (T), L 2. DELE *RRRR 3. STOP
	DELETE programs CCCC through TTTT from a tape consisting of routines AAAA through ZZZZ without Tape Loader.	1. INOUT (T), (T) 2. DELE CCCC 3. DELE TTTT, SKIP 4. STOP
SOURCE CORRECTIONS WHILE COPYING	Insert 5 Source Cards in program BBBB, after page-line-insert number 00600 and copy remainder of tape.	1. INOUT (T), (T) 2. ALTER BBBB 3. SORS 00600, 0, 5 -5 Source Additions 99. STOP

SERVICE	FUNCTION	COMMAND NEEDED
	Same as above but delete lines 00600 to 00605 while making additions.	1. INOUT (T), (T) 2. ALTER BBBB 3. SORS 00600, 00605, 5 } -5 Source Additions 99. STOP
SOURCE CORRECTIONS WHILE COPYING	Delete lines 00600 to 00610 in program BBBB while skipping from beginning of the Input to BBB and copying remainder to Output.	1. INOUT (T), (T) 2. ALTRR BBBB, SKIP 3. SORS 00600, 00610, 0 4. STOP
HDR CHANGE	Replace header program BBBB. Output tape to have a Tape Loader and copy entire tape.	1. INOUT (T), (T), L 2. ALTRR BBBB 3. HDR 4. New HDR Card 5. STOP

8.0 I M P O R T A N T N O T E S O N A J A X

1. The output tape will never have a tape loader on the front unless the p3 parameter of the INOUT card is "L".
2. OBJECT CARD handling is not performed by AJAX, use OPUS (Object Program Updating System).
3. Service Commands (PRINT, PUNCH, LIST) perform one service at a time and may not be intermixed.
4. On FILE(T) and REPL(T) commands the tape unit is variable (0-9). Programs to be filed or replaced may be stacked on the same tape unit or not, as desired, but must be in positional filing sequence.
5. PRINT, PUNCH, and LIST do not produce an output tape, therefore, they cannot be intermixed with program commands. Program and miscellaneous commands, however, may be intermixed as desired.
6. Programs are operated on in tape sequence only.
7. The examples, although extensive, are not complete. Use of the p2 (SKIP) parameter can be very useful in automatic deletion, while performing other functions. (See discussion of SKIP parameter at end of document.)
8. The Prog-ID may be 4 characters or less.

9.0 A J A X C O M M A N D L I S T

COMMAND	PARAMETER 1	PARAMETER 2	PARAMETER 3
INOUT	Input Unit	Output Unit	Tape Loader
REPL(T)	Program Replaced	SKIP or blank	N. A.
FILE(T)	Program before Filed one	SKIP or blank	N. A.
DELE	Program Deleted	SKIP or blank	N. A.
COPY	Program Copied	SKIP or blank	N. A.
ALTER	Program Altered	SKIP or blank	N. A.
SORS	First line of Deletion or if p2=0, line before insertion.	Last line of Deletion or 0 if no deletion.	Number of added cards
HDR	N. A.	N. A.	N. A.
PRINT	Program Printed	SKIP or blank	N. A.
PUNCH	Program Punched	SKIP or blank	N. A.
LIST	N. A.	N. A.	N. A.
STOP	Blank = Copy SKIP = Terminate	Blank = Do nothing END = Load OSO when AJAX functions, completed.	N. A.

NOTE:

SKIP always effects the programs from the present position of the tape to p1.
(See discussion of SKIP which follows.)

9.1 SKIP

The SKIP parameter may be used with all commands except the following: LIST, SORS, and HDR.

Its presence or absence has a large effect on the command which contains it.

Example:

Assume a tape library consisting of programs numbered 0001 to 0400. The following two commands,

```
DELE 0010
DELE 0040
```

would result in the deletion of the two routines only, however,

```
DELE 0010
DELE 0040, SKIP
```

would result in the deletion of all routines from 0010 through 0040 inclusive, and

```
DELE 0010
STOP SKIP
```

would result in the deletion of the entire tape past 0009. The same pattern follows with REPL, FILE, ALTER, and COPY.

- SKIP (p2) when used with program correction commands (DELE, REPL, FILE, COPY, and ALTER) performs automatic deletion from the present position of the tape to p1.
- SKIP (p2) when used with program service commands (PRINT and PUNCH) will delete the function of PRINT or PUNCH from the present position of tape to p1. In other words, its absence allows punching or printing from present position of tape to p1 inclusive.

10.0 A J A X S T O P S

<u>M ADDRESS</u>	<u>REASON AND ACTION</u>
021110	AJAX ready - depress START button.
040x44	Block count error x-tape, restart.
020772	Tape unit in FILE or REPLACE already in use from INOUT card. Move tape, reload new command card.
024141	Card to tape command not followed by a STOP card; load STOP card and depress START button.
024142	Tape to print command not followed by STOP, LIST, or PRINT card; load proper command, depress START button.
024143	Tape to card command not followed by STOP or PUNCH command. Reload proper command, depress START button.
022220	Cannot locate p1 (maybe tape positioning) restart.
022222	Object programs not acceptable from reader (use OPUS).
022223	Object punch requested - not provided, restart (use OPUS).
020700	Command not recognized, reload proper command, depress START button.
027777	Successful completion. Depress START button to re-initialize, or load Executive System as designated by STOP card.
020510	Header missing REPL or FILE; reload HDR card or new tape and depress START button.
024222	No STOP card after LIST; load STOP card and depress START button.
020100	Page-line-insert number cannot be located, restart.
020300	n3 = 0 on source insertion; reload SORS command, depress START button.
020550	Parameter size error - reload proper command card and depress START button.
010000	Printer off normal, clear problem, depress START button.
012000	Punch off normal, clear problem, depress START button.
011000	Reader error, reload 1 card unless the reader motor is off, depress START button (column reader always reload one except for offline).
027272	No INOUT card. Load one and depress START button.
140x66	where x equals tape unit. Tape parity, depress START button for recovery attempt.
140x55	Unrecoverable tape error. Restart.