AN EDITOR FOR THE SOS TREE TRIGGER PAGES

Serge OLIGER

CONTENTS

I) GENERALITIES

The "consoles" in the MAIN CONTROL ROOM have, among other facilities, 2 four-trace oscilloscopes for displaying analogue and trigger signals.

Analogue signals come from particle-accelerator equipments (electro-magnets, power-supplies, etc...).

The SIP program allows the operator, after pressing a short sequence of buttons on a touch panel, to connect the desired analogue (ANASIP process) or trigger (TRIGSIP process) signal to the trace of an oscilloscope.

The SOS TREE TRIGGER PAGE EDITOR is an interactive program which permits an authorized operator to easily modify the layout of the triggers touch-panel pages and also the default setting values for each accelerator.

CONSOLE LAYOUT
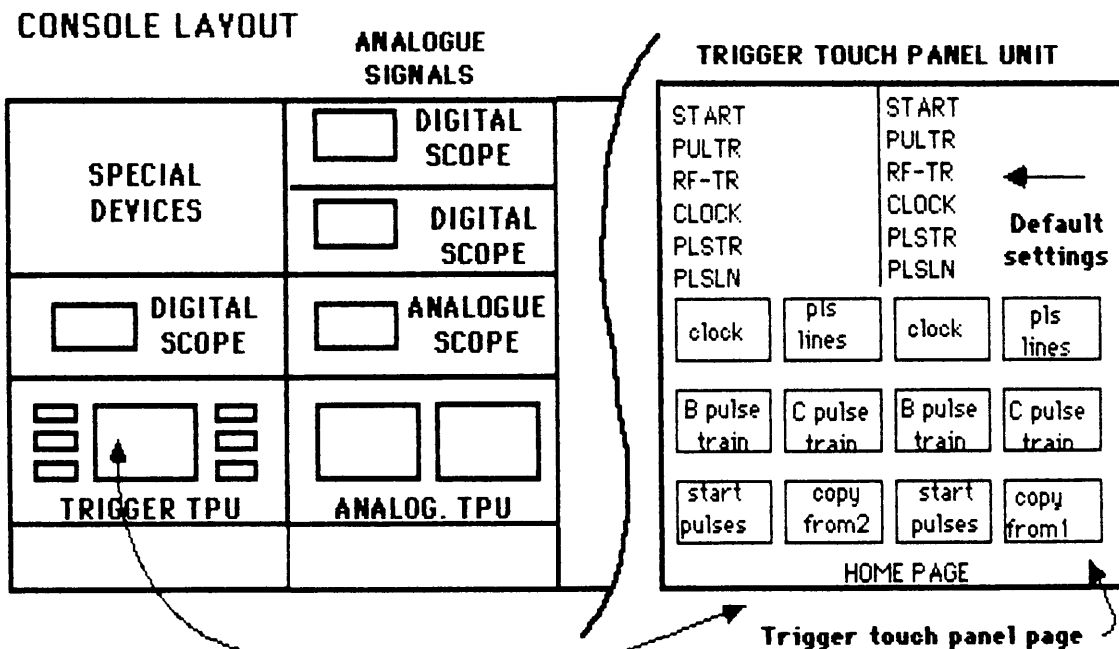
This program can be run on any console (but MCR) and uses the colour screen, the four black and white TVs, the tracker ball, the keyboard, and the user touch panel unit.

The intent of this paper is to give both the operator and the programmer a precise idea of the content of the TRIGGER PAGE EDITOR package.

II) FUNCTIONAL SPECIFICATIONS

The trigger data base is constitued of 3 files:

- TRIGMENU:DATA:

Contains the description of the layout of the Trigger Touch Panel Pages.

- TRIGDEF:DATA:

Contains the Trigger default setting values for each accelerator.

- STARTPULSE:DATA

Contains the Start pulse names.

1) TRIGMENU:DATA

1.1) Page type

In the file TRIGMENU:DATA there are 3 different kinds of pages:

- **TYPE_0**: The MENU pages: general purpose pages in which each button can perform any action (i.e.: call other pages, set special triggers, choose the machine).

- **TYPE_1**: The PLS pages: contains only type 11, 12, 14, 15 buttons.

- **TYPE_2**: The START pages: contains only type 13, 14, 15 buttons.

Each page has the following information attached:
```
PAGE TYPE:    an integer, as seen before.
TITLE:        a string, up to 40 characters.
BUTTON DATA:  data for up to 12 buttons.
```

(See also §1.3: page layout)

1.2) Button type

The buttons diseminated in the pages can be of the following types.

- **TYPE_1**: GETMENU: if pushed another page will be displayed.

- **TYPE_2**: GETPLSPAGE: if pushed the first PLS PAGE for the chosen accelerator will be displayed.

- **TYPE_3**: GETSTART: if pushed the first START PAGE for the chosen accelerator will be displayed.

- **TYPE_4**: SETPULTR: if pushed the corresponding PULSE TRAIN for the chosen accelerator is selected.

- **TYPE_5**: COPY: if pushed the settings on one side of the trigger touch panel are copied to the other side.

- **TYPE_6**: SETMACH: if pushed the corresponding accelerator is chosen.

- **TYPE_7**: SETCLOCKINT: if pushed the corresponding CLOCK INTERVAL is selected.

- **TYPE_8**: SETRFTR: if pushed the corresponding RF TRAIN is selected.

- **TYPE_9**: RESTARTTRIG: if pushed the program TRIGSIP is restarted.

- **TYPE_10**: RESTARTANA: if pushed the program ANASIP is restarted.

- **TYPE_11**: SETACCUMMODE: if pushed, up to 3 PLS LINES can be selected together.

- **TYPE_12**: SETPLSLN: if pushed the corresponding PLS LINE is selected.

- **TYPE_13**: SETSTART: if pushed the corresponding START PULSE is selected.

- **TYPE_14**: SUITE: if pushed the SUITE PAGE is displayed.

- **TYPE_15**: HOME: if selected the HOME PAGE is displayed.

Each button can have the following information attached:

TYPE　　　: An integer, as seen before
ARGUMENT: An integer.
LEGENG　　: A string, up to 24 characters.
BWMODE　: The button can be displayed in standart or reverse mode

Button type	Argument	Legend
1	page number to be called	any
2	-	PLS LINES
3	-	START PULSES
4	1	B/P PULSE TRAIN
	2	C/D PULSE TRAIN
5	1	COPY FROM 1
	2	COPY FROM 2
6	0	MACHINE PS
	1	MACHINE PSB
	2	MACHINE AA
	3	MACHINE LPI
	4	MACHINE LINAC
7	1	CLOCK 1 MICROSEC
	10	CLOCK 10 MICROSEC
8	cable number	pulse name RF TRAIN
9	-	RESTART TRIGSIP
10	-	RESTART ANASIP
11	-	STACK
12	pls line number or -1	groupe name or "ALL"
13	cable number	start pulse name
14	page number to be called	SUITE
15	1	HOME

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1.3) Page layout

The layout of a TRIGMENU:DATA page is as follows:

Word	Field name	Field layout	Comment
0	PAGE	INTEGER	Page type: range[0..2]
1	TITLE	ROW[1..20] OF INTEGER	Page title
21	BUT	BUTREC: RECORD	
		FUNC :ROW[1..4] OF INTEGER	Button type: range[1..15]
		ARG :INTEGER	Button argument
		LEGEND :REAL	Button legend
		BWMODE :REAL	Button display mode (normal or inversion)
36	BUT	BUTREC: RECORD	
51	BUT	BUTREC: RECORD	These button records are repeated 12 times (the number of buttons in a page).
:			
:			
:			
186	BUT	BUTREC: RECORD	
201			

1.4) TRIGMENU layout

WORD (16 bits)

```
0 | 0 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1
1 | 1 1 1 0 1 0 0 1 1 1 1 1 1 1 1 1
```

Directory always exists

empty page 28

if bit = 1: the page exists
if bit = 0: the page is free

149

150	Current number of machines

151	18		PLS (type 1)
152	6	Pages number of the first	START (type 2)
153	1	page of some types ->	DEFAULT (type 3)
154	6	machine PS	TRAIN (type 4)
155	7		TRAIN (type 4)

156	machine PSB
161	machine AA
166	machine LPI
171	machine LINAC
176	machine SPARE1 | | machine SPARE5

idem words 151 -> 155

Bit 1 of directory word 0 -> page 1

Directory (page 0)

201	Page type
202	Page title
222	Button type
223	Button argument
224	Button legend
236	Button display mode

* 12
for 12
buttons

Page 1

402	Page 2

idem words 201 -> 401

Touch panel pages

Page (149 + 1) * 16 - 1

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2) TRIGDEF:DATA

2.1) Page type

In the file TRIGDEF:DATA there are 3 different kinds of pages:

- **TYPE_3**: The DEFAULT pages: they contain a fixed set of information. There is one default page per accelerator.

- **TYPE_4**: The TRAIN pages: only the PULTR field (see below) of the default page is meaningful in this case.

- **TYPE_5**: The GLOBAL pages: they contain the same set of information as the default pages; each global page is related to a corresponding page in the SOS PAGE data base, according to the following relationship. The first global page number must be 51.

NOTE: **A global page number of the SOS TRIGGER PAGE EDITOR corresponds to the global page number - 800 of the SOS PAGE EDITOR.**

2.2) Page layout

The layout of a TRIGDEF:DATA page is as follows:

Word	Field name	Field layout		PAGES: type_3	type_4	type_5
			Field value range	type_3	type_4	type_5
0	PAGE	INTEGER		3..5	3..5	3..5
1	START	STARTREC: RECORD				
		NAME	:ROW[1..4] OF INTEGER	name	""	name
		CABLE_N°	:INTEGER	1..48	-10	1..48
6	PULTR	PULTRREC: RECORD				
		NAME	:ROW[1..4] OF INTEGER	name	name	name
		CABLE_N°	:INTEGER	1..16	1..16	1..16
		DELAY	:REAL	0	0	X.0
14	RFTR	RFTRREC: RECORD				
		NAME	:ROW[1..4] OF INTEGER	name	""	name
		CABLE_N°	:INTEGER	1..4	-10	1..4
		DELAY	:REAL	0	0	X.0
22	CLOCK	CLOCKREC: RECORD				
		INTERVAL	:INTEGER	1	1	1..X
		DELAY	:REAL	0	0	X.0
26	PLSTR	PLSTRREC: RECORD				
		NAME	:ROW[1..4] OF INTEGER	name	""	name
		CABLE_N°	:INTEGER	1..4	-10	1..4
31	PLSLN	PLSLNREC: RECORD				
		NAME1	:ROW[1..4] OF INTEGER	"ALL"	""	name
		PLS_N°1	:INTEGER	-1	-10	1..X
		NAME2	:ROW[1..4] OF INTEGER	""	""	name
		PLS_N°2	:INTEGER	0	-10	1..X
		NAME3	:ROW[1..4] OF INTEGER	""	""	name
		PLS_N°3	:INTEGER	0	-10	1..X
46	MACH	INTEGER		0..Mx	0..Mx	0..Mx
47						

X.0 (real value) or X (integer value) means that the value is actually not limited.

Mx is the highest machine number in service (actually 4).

2.3) TRIGDEF layout

WORD (16 bits)

if bit = 1: the page exists
if bit = 0: the page is free

empty page 28

Directory always exists

Directory (page 0)

Bit 2 of directory word 0 -> page 2

Default data pages

Word		
0 ... 46	1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 / 1 0 1 0 1 0 0 1 0 1 0 1 0 1 0 0	
47	Page type	
48	Name / Cable number	START
53	Name / Cable number / Delay	PULTR
61	Name / Cable number / Delay	RFTR
69	Interval / Delay	CLOCK
73	Name / Cable number	PLSTR
78	Name1 / Pls_n°1 / Name / Pls_n°1 / Name / Pls_n°1	PLSLN
93	Machine number	

Page 1

Page 2 94

idem words 47 -> 93

Empty page

Page (46 + 1) *16 - 1

3) STARTPULSE:DATA

3.1) Pulse sets

In the file STARTPULSE:DATA there are actually four different sets of pulse names.

- START TRIGGER

- STANDARD TRAIN

- RF TRAIN

- PLS TELEGRAM

Two more empty sets are foreseen for an eventual extension.

Each set can contain up to fifty pulse names of 8 characters which are stocked as packed arrays (NAME: ROW[1..4] of INTEGER).

3.2) STARTPULSE layout

WORD (16 bits)

0	Name 1 SET 1
4	Name 2
8	START TRIGGER
196	Name 50
200	STANDARD TRAIN SET 2
400	RF TRAIN SET 3
600	PLS TELEGRAM SET 4
800	EMPTY SET5
1000	EMPTY SET6
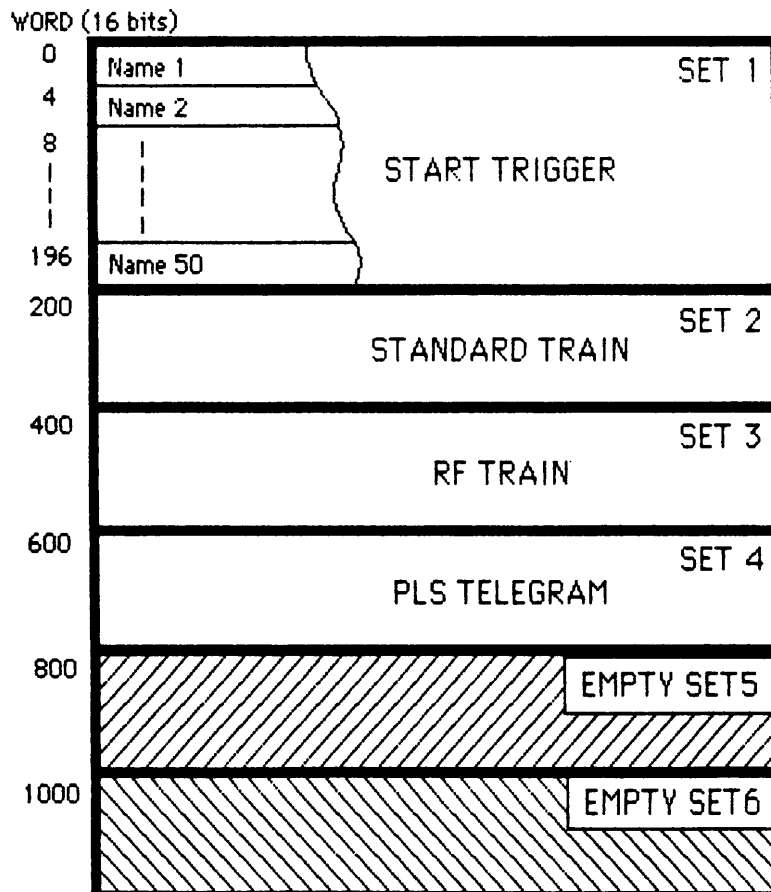
III) USERS GUIDE

1) How to call the SOS TRIGGER page editor

This program can be run in two different ways on any console in the main console room (except the MCR console).

- Under nodal, you can type:

➡   RUN <TREES>(SOS-TREE)TRIGED-MAIN

- On the tree touch panel, you can give the sequence:

At level 1 (accelerator)	➡	OTHER TREES
At level 1 (accelerator)	➡	SOFTWARE SPECIALIST
At level 1 (accelerator)	➡	PS
At level 4 (system)	➡	SOS + VIDEO
At level 5 (subsystem)	➡	TRIGGER PAGES EDITOR

After some seconds the home page will be displayed.

2) General working

In the next pages you will find synoptics and screen copies which will explain you how to edit:
- A touch panel page.
- A button in a touch panel page.
- A trigger default page.

and how to operate with:
- The User Touch Panel Unit.

2.1) Touch panel page edition

2.1.1) Action on colour screen

TOUCH-PANEL PAGE EDITION
(action on the TV screen with tracker ball)
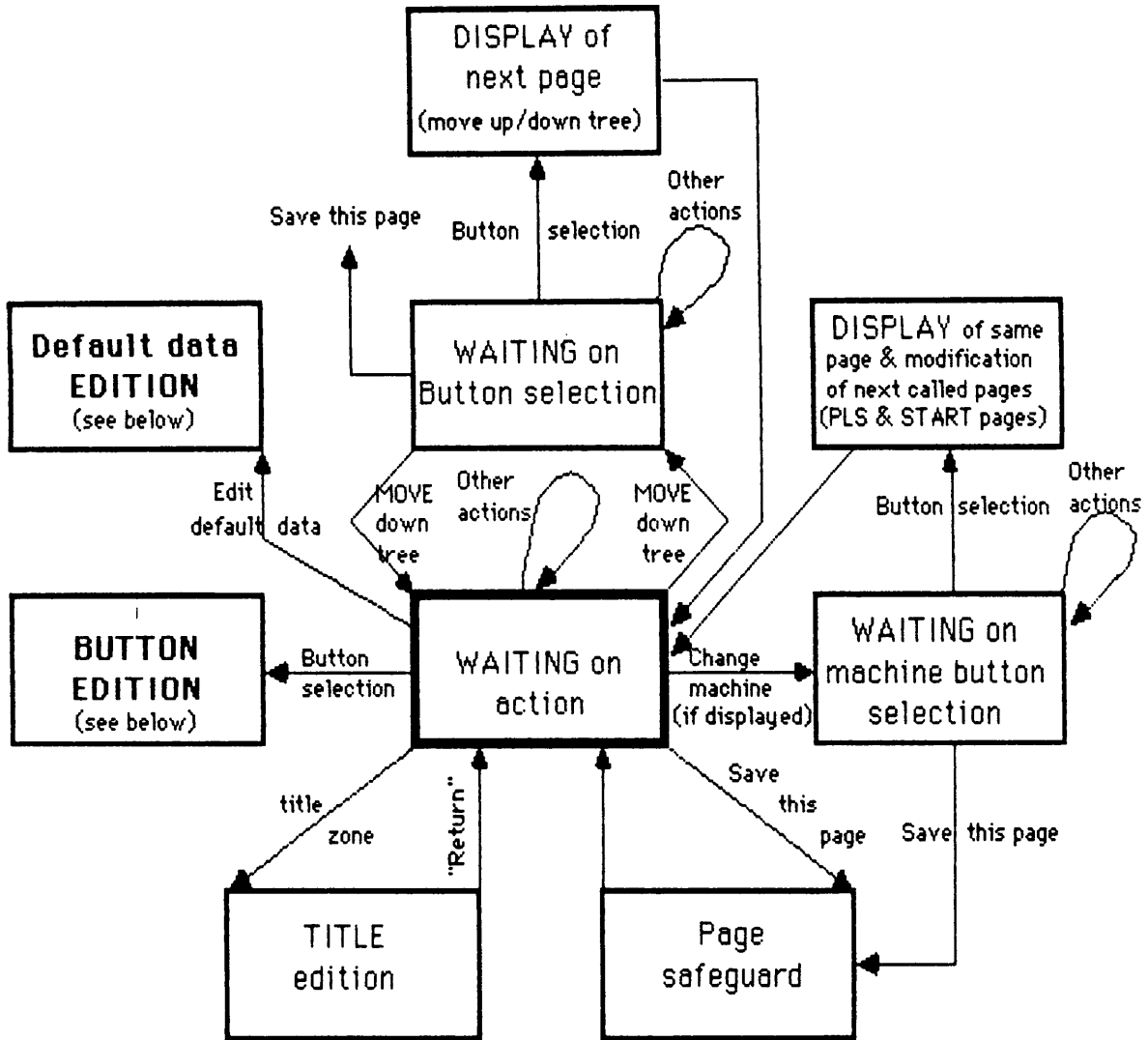
* The arrows are showing the transitions between the states. (actions with tracker ball, "return" key on keyboard or program action)

* The rectangles are showing the situations, the static states.

The relevant pages are of type 0 (menu pages), 1 (PLS pages) or 2 (START pages).

Restriction:
The greatest page number is: 149 * 16 - 1 = 2383.

```
                    THIS PAGE = 100          1986-11-07-09:46:27
START                    !START
PULTR                    !PULTR
RF-TR                    !RF-TR
CLOCK                    !CLOCK            ┌────────┐
PLSTR                    !PLSTR            │ PAGE   │
PLSLN                    !PLSLN            │ TYPE   │
------------------------------------      │   0    │
┌──────────┐                              └────────┘
│ Empty    │  ──→                         ┌────────┐  ┌────────┐
│ button   │                              │ MOVE   │  │ CHANGE │
│        0 │        0        0        0   │ DOWN   │  │MACHINE │
└──────────┘                              │ TREE   │  └────────┘
      │                                   └────────┘
      ↓    1 to 12 Trigger Touch-Panel buttons    Not always
            0        0        0        0  ┌────────┐   displayed
                                          │ SELECT │
                                          │ A      │
                                          │ BUTTON │
                                          └────────┘
            0        0        0        0  ┌────────┐  ┌────────┐
                                          │ SAVE   │  │ EDIT   │
------------------------------------      │ THIS   │  │DEFAULT │
TITLE:                                    │ PAGE   │  │ DATA   │
                                          └────────┘  └────────┘
          TITLE ZONE                        Special buttons
```

COMMENT: GENERAL PAGE FOR TOUCH-PANEL PAGE EDITION

```
                    THIS PAGE =    2          1986-11-06-11:45:17
START                    !START
PULTR                    !PULTR
RF-TR                    !RF-TR            ┌────────┐  ┌────────┐
CLOCK                    !CLOCK            │ PAGE   │  │MACHINE │
PLSTR                    !PLSTR            │ TYPE   │  │ PS     │
PLSLN                    !PLSLN            │   0    │  │   0    │
------------------------------------      └────────┘  └────────┘
┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐
│MACHINE │ │MACHINE │ │ CLOCK  │ │ CLOCK  │ │ MOVE   │ │ CHANGE │
│ PSB    │ │ PS     │ │  1     │ │  10    │ │ DOWN   │ │MACHINE │
│        │ │        │ │MICROSEC│ │MICROSEC│ │ TREE   │ └────────┘
└────────┘ └────────┘ └────────┘ └────────┘ └────────┘
┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐
│MACHINE │ │MACHINE │ │PX.TRF  │ │PX.TRV  │ │ SELECT │
│ AA     │ │ LPI    │ │        │ │        │ │ A      │
│        │ │        │ │RF-TRAIN│ │RF-TRAIN│ │ BUTTON │
└────────┘ └────────┘ └────────┘ └────────┘ └────────┘
┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐
│MACHINE │ │        │ │ HOME   │ │SPECIAL │ │ SAVE   │ │ EDIT   │
│ LINAC  │ │        │ │        │ │COMMANDS│ │ THIS   │ │DEFAULT │
│        │ │      0 │ │     1  │ │     3  │ │ PAGE   │ │ DATA   │
└────────┘ └────────┘ └────────┘ └────────┘ └────────┘ └────────┘
------------------------------------
TITLE:          MACHINE, CLOCK & SPECIALS
          Empty button
                              See page:  15-A : Print this page
```
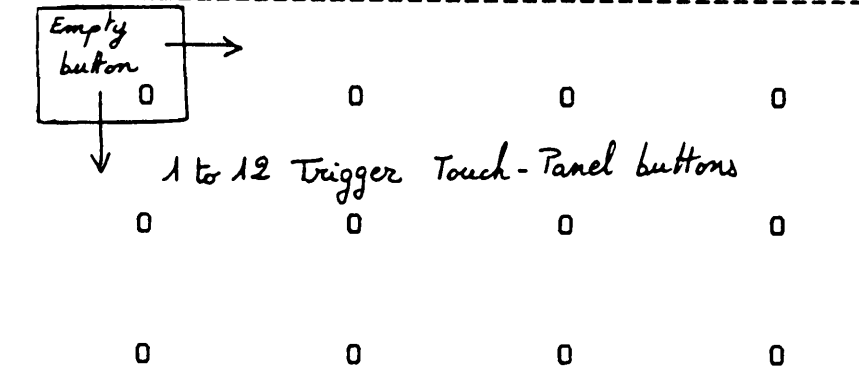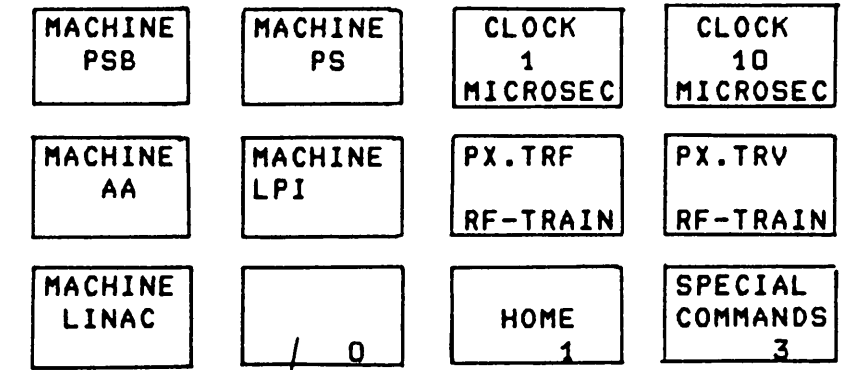
COMMENT:PAGE TYPE 0 (MENU PAGE)

THIS PAGE =   18   1986-11-06-12:05:54

```
START              !START
PULTR              !PULTR
RF-TR              !RF-TR
CLOCK              !CLOCK                    ┌─────────┐
PLSTR              !PLSTR                    │  PAGE   │
PLSLN              !PLSLN                    │  TYPE   │
                                             │   1     │
                                             └─────────┘
```

SFT	SPP	AA	TST	MOVE DOWN TREE	CHANGE MACHINE
MD	PHY	SPN	LEA	SELECT A BUTTON	
ALL	STACK	HOME 1	SUITE 18	SAVE THIS PAGE	EDIT DEFAULT DATA

TITLE: PLS LINES: USER

COMMENT: PAGE TYPE 1 (PLS PAGE)

───

THIS PAGE =   6   1986-11-06-12:07:16

```
START              !START
PULTR              !PULTR
RF-TR              !RF-TR
CLOCK              !CLOCK                    ┌─────────┐
PLSTR              !PLSTR                    │  PAGE   │
PLSLN              !PLSLN                    │  TYPE   │
                                             │   2     │
                                             └─────────┘
```

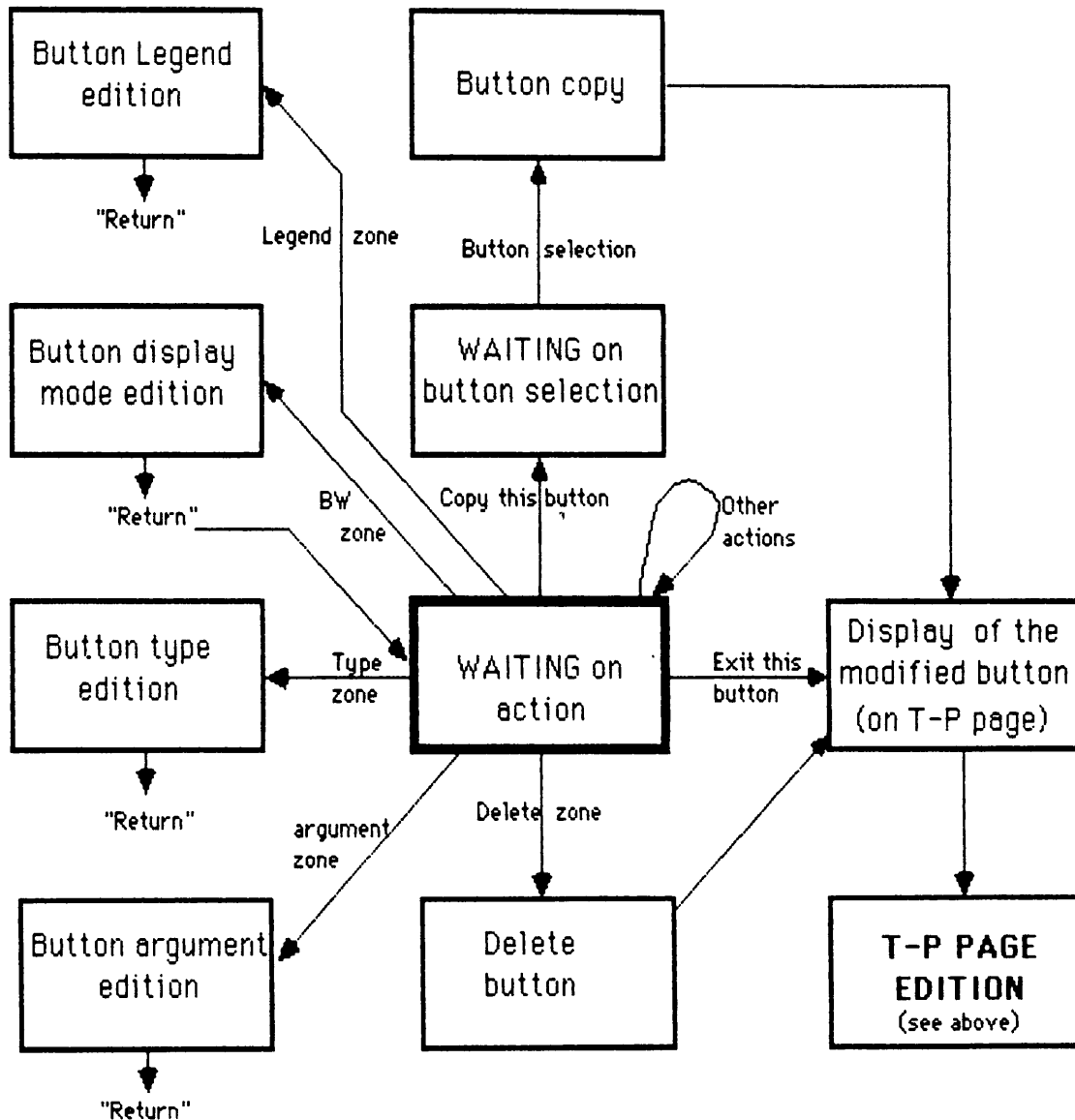| PX-STC | 0 | PX-WTR | PX-RTR | MOVE DOWN TREE | CHANGE MACHINE |
| 0 | 0 | 0 | 0 | SELECT A BUTTON | |
| 0 | 0 | HOME 1 | SUITE 7 | SAVE THIS PAGE | EDIT DEFAULT DATA |

TITLE: START PULSES FOR PS

COMMENT: PAGE TYPE 2 (START PAGE)

TOUCH-PANEL BUTTON EDITION
(action on the TV screen with tracker ball)

* The arrows are showing the transitions between the states. (actions with tracker ball, "return" key on keyboard or program action)

* The rectangles are showing the situations, the static states.

The relevant buttons are of type 0 to 15.

Restrictions:
Button type 12 must be in a page of type 1.
Button type 13 must be in a page of type 2.

The other restrictions are given in paragraph 3 (Error messages and general messages meaning).

```
                    THIS PAGE =   1           1986-11-06-12:08:09
LEGEND MACHINE,CLOCK & SPECIALS  ←  Legend zone
BUTTON INVERSION NO              ←  B/I zone
TYPE          1                  ←  Type zone
PAGE NUMBER        2             ←  Argument zone        ┌─────────┐
                                                         │  PAGE   │
                                                         │  TYPE   │
                              DELETE THIS BUTTON         │   0     │
                                                         └─────────┘
------------------------------------------------
┌──────────┐  ┌────────┐  ┌──────────┐  ┌────────┐  ┌─────────┐
│ MACHINE, │  │  PLS   │  │ MACHINE, │  │  PLS   │  │  EXIT   │
│ CLOCK &  │  │ LINES  │  │ CLOCK &  │  │ LINES  │  │  THIS   │
│    2     │  │   18   │  │    2     │  │   18   │  │ BUTTON  │
└──────────┘  └────────┘  └──────────┘  └────────┘  └─────────┘
┌──────────┐  ┌────────┐  ┌──────────┐  ┌────────┐  ┌─────────┐
│  B/P     │  │  C/D   │  │  B/P     │  │  C/D   │  │ SELECT  │
│  PULSE   │  │  PULSE │  │  PULSE   │  │  PULSE │  │  A      │
│  TRN     │  │  TRAIN │  │  TRN     │  │  TRAIN │  │ BUTTON  │
└──────────┘  └────────┘  └──────────┘  └────────┘  └─────────┘
┌──────────┐  ┌────────┐  ┌──────────┐  ┌────────┐  ┌─────────┐
│  START   │  │  COPY  │  │  START   │  │  COPY  │  │  COPY   │
│  PULSES  │  │ FROM 2 │  │  PULSES  │  │ FROM 1 │  │  THIS   │
│    6     │  │        │  │    6     │  │        │  │ BUTTON  │
└──────────┘  └────────┘  └──────────┘  └────────┘  └─────────┘
------------------------------------------------
TITLE:            H O M E     P A G E
```

COMMENT: PAGE TYPE 0: BUTTON EDITION

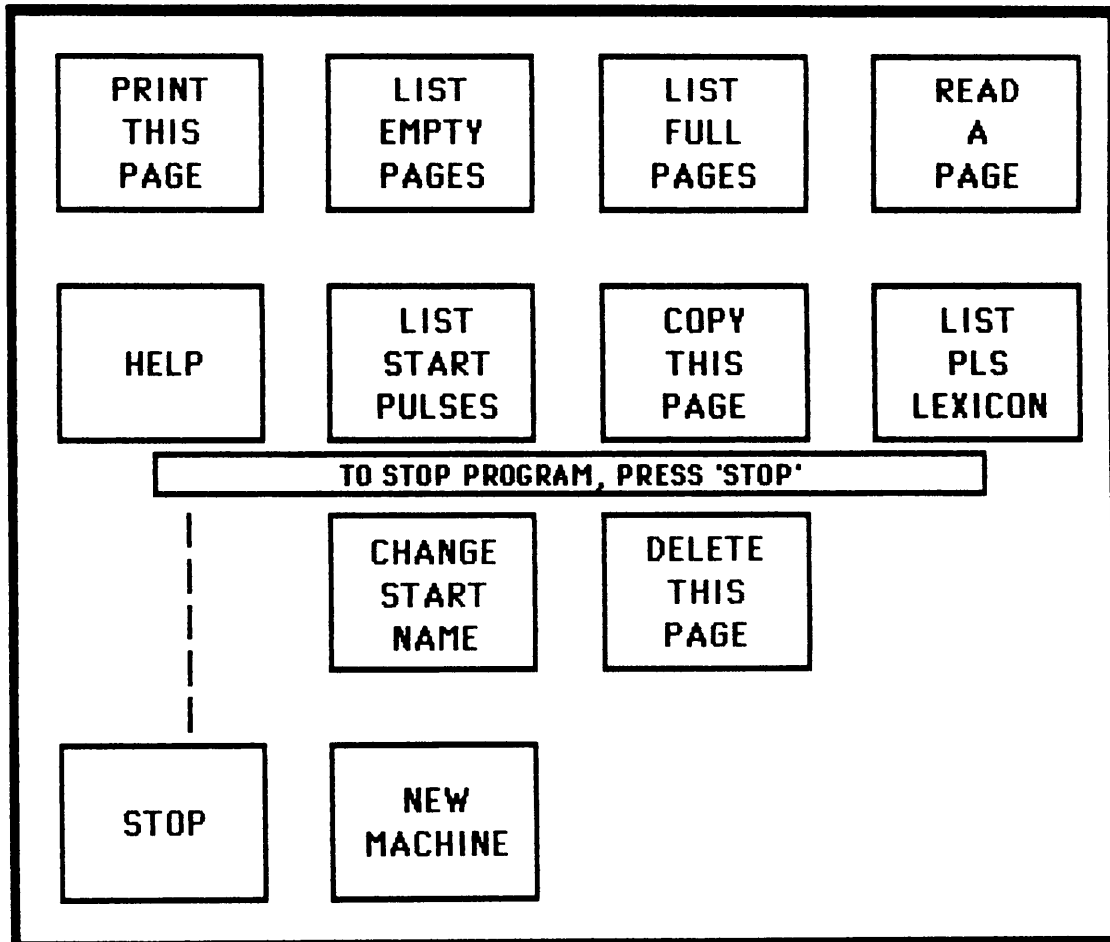See page: 14-A

DISPLAY OF THE CURRENT T-P PAGE   1986-11-06-11:45:45

PAGE TITLE :   MACHINE, CLOCK & SPECIALS

PAGE NUMBER :   2

PAGE TYPE   :   0

MACHINE   :   PS

BUTTON	LEGEND			INVERSION	TYPE	ARGUMENT
1	MACHINE	PSB		NO	6	1
2	MACHINE	PS		NO	6	0
3	CLOCK	1	MICROSEC	NO	7	1
4	CLOCK	10	MICROSEC	NO	7	10
5	MACHINE	AA		NO	6	2
6	MACHINE	LPI		NO	6	3
7	PX.TRF		RF-TRAIN	NO	8	2
8	PX.TRV		RF-TRAIN	NO	8	3
9	MACHINE	LINAC		NO	6	4
10				YES	1	0 ← empty button
11		HOME		NO	15	1
12	SPECIAL COMMANDS			NO	1	3

COMMENT:PRINT THIS PAGE (action on T-P-U)

```
+-----------------------------------------------------------+
|  +--------+   +--------+   +--------+   +--------+         |
|  | PRINT  |   | LIST   |   | LIST   |   | READ   |         |
|  | THIS   |   | EMPTY  |   | FULL   |   | A      |         |
|  | PAGE   |   | PAGES  |   | PAGES  |   | PAGE   |         |
|  +--------+   +--------+   +--------+   +--------+         |
|                                                           |
|  +--------+   +--------+   +--------+   +--------+         |
|  |        |   | LIST   |   | COPY   |   | LIST   |         |
|  | HELP   |   | START  |   | THIS   |   | PLS    |         |
|  |        |   | PULSES |   | PAGE   |   | LEXICON|         |
|  +--------+   +--------+   +--------+   +--------+         |
|      +-------------------------------------------+        |
|      |    TO STOP PROGRAM, PRESS 'STOP'          |        |
|      +-------------------------------------------+        |
|      |        +--------+   +--------+                     |
|      |        | CHANGE |   | DELETE |                     |
|      |        | START  |   | THIS   |                     |
|      |        | NAME   |   | PAGE   |                     |
|      |        +--------+   +--------+                     |
|      |                                                    |
|  +--------+   +--------+                                  |
|  |        |   | NEW    |                                  |
|  | STOP   |   | MACHINE|                                  |
|  |        |   |        |                                  |
|  +--------+   +--------+                                  |
+-----------------------------------------------------------+
```

The user touch panel can only be used in trigger touch panel page edition mode.

* **PRINT THIS PAGE**: Prints on black & white TV 3 the button legends, display modes, types and arguments of the current page.

* **LIST EMPTY PAGES**: Lists on black & white TV 3 the 220 first empty touch panel pages.

* **LIST FULL PAGES**: Lists on black & white TV 1 the full touch panel pages.

* **READ A PAGE**: Reads a touch panel page. If the page to be read is empty, the page type (0, 1 or 2) must be given.

* **HELP**: Displays another user touch panel for decoding page types and button types. The tracker ball is disabled during this operation (press back on the newly displayed touch panel for returning in edition mode).

* LIST START PULSES: Lists on black & white TV:
  - N°1: the START TRIGGER pulses,
  - N°2: the STANDARD TRAIN pulses,
  - N°3: the RF TRAIN pulses,
  - N°4: the PLS TELEGRAM.

* COPY THIS PAGE: Copies the currently displayed page on a specified page. If the specified page is not empty a confirmation must be given.

* LIST PLS LEXICON: Lists the PLS lexicon for the current machine.

* CHANGE START NAME: Allows the operator to modify the actual name of a START pulse in the STARTPULSE:DATA file. This must be done in co-operation with the concerned hardware specialist.

* DELETE THIS PAGE: Deletes the currently displayed page and returns to the home page.

* STOP: Stops the program.

* NEW MACHINE: Allows the operator to add a new machine. A set of pages of types 1 (1 PLS page), 2 (1 START page), 3 (1 DEFAULT page) & 4 (2 TRAIN pages) are cleaned and reserved in order to take into account the new accelerator. The modified program is transfered on the TREES computer and saved in the file <TREES>(SOS-TREE)TRIGED-MAIN:NOD.

LIST OF FULL T-P PAGES   1986-11-06-11:58:36

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
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	63								

COMMENT: LIST FULL TRIGGER TOUCH-PANEL PAGES (Example)

FIRST 220 EMPTY T-P PAGES   1986-11-07-16:56:42

62	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
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	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	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	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	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	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272
273	274	275	276	277	278	279	280	281	282

COMMENT: LIST EMPTY TRIGGER TOUCH-PANEL PAGES (Example)

2.2) Trigger default page edition

2.2.1) Action on colour screen

DEFAULT DATA PAGE EDITION
(action on the TV screen with tracker ball)
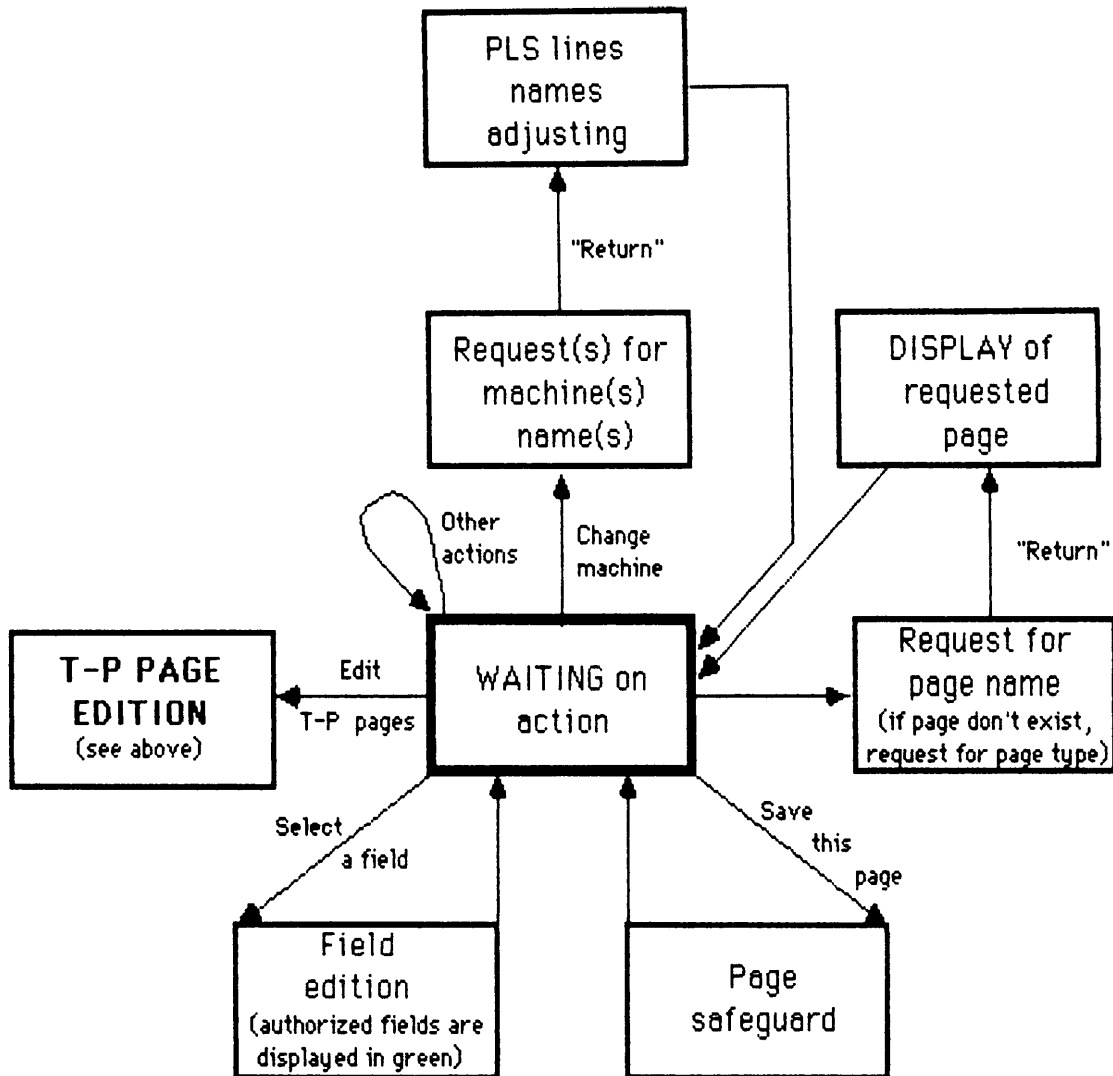
* The arrows are showing the transitions between the states. (actions with tracker ball, "return" key on keyboard or program action)

* The rectangles are showing the situations, the static states.

The relevant pages are of type 3 (default pages), 4 (train pages) or 5 (global pages).

Restrictions:

The number of the last readable page is 100.
The type 3 & 4 page numbers must be in range 1 to 50.
The type 5 pages are coupled (51 & 101, 52 & 102, ..., 100 & 150).

```
          NAMES    INT.  CABLE   DELAY

START                                        ┌──────┐
PULTR                                        │PAGE  │
RF-TR      ← Edition fields for types 3 & 4 pages.   │TYPE  │
CLOCK                                        └──────┘
PLSTR                                        ┌──────┐   ┌────────┐
PLSLN                                        │READ  │   │CHANGE  │
                                             │A     │   │MACHINE │
                                             │PAGE  │   └────────┘
                                             └──────┘
START    ←──────────── Edition fields for type 5 pages
PULTR
RF-TR
CLOCK                                        ┌──────┐   ┌────────┐
PLSTR                                        │SAVE  │   │EDIT    │
PLSLN                                        │THIS  │   │T.P.    │
                                             │PAGE  │   │PAGES   │
                                             └──────┘   └────────┘
```

COMMENT: GENERAL PAGE FOR DATA EDITION

```
        THIS PAGE =   1              1986-11-07-10:06:28

          NAMES    INT.  CABLE   DELAY

START   PX-STC           20                 ┌──────┐   ┌────────┐
PULTR   PX-TCX            7        0         │PAGE  │   │MACHINE │
RF-TR   PX-TRF           2         0         │TYPE  │   │PS      │
CLOCK             1                0         │3     │   │0       │
PLSTR   PX-TPLS         2                    └──────┘   └────────┘
PLSLN   ALL             -1                   ┌──────┐   ┌────────┐
                         0                   │READ  │   │CHANGE  │
                         0                   │A     │   │MACHINE │
                                             │PAGE  │   └────────┘
START                                        └──────┘
PULTR    The autorized fields are displaied  ┌──────┐
RF-TR    in green.                           │SELECT│
CLOCK                                        │A     │
PLSTR                                        │FIELD │
PLSLN                                        └──────┘
                                             ┌──────┐   ┌────────┐
                                             │SAVE  │   │EDIT    │
                                             │THIS  │   │T.P.    │
                                             │PAGE  │   │PAGES   │
                                             └──────┘   └────────┘

        PAGE:   1   MACHINE:   0    ← "CHANGE MACHINE" button
                                      has been pressed.
```

COMMENT: PAGE TYPE 3 (WITH ACTION ON CHANGE MACHINE BUTTON)
          (DEFAULT PAGE)

THIS PAGE = 6   1986-11-07-10:10:18

	NAMES	INT.	CABLE	DELAY
START			-10	
PULTR	BX-TDBC		1	0
RF-TR			-10	0
CLOCK		1		0
PLSTR			-10	
PLSLN			-10	
			-10	
			-10	
START				
PULTR				
RF-TR				
CLOCK				
PLSTR				
PLSLN				

```
+-----------+  +-----------+
| PAGE      |  | MACHINE   |
| TYPE      |  | PS        |
| 4         |  | 0         |
+-----------+  +-----------+

+-----------+  +-----------+
| READ      |  | CHANGE    |
| A         |  | MACHINE   |
| PAGE      |  |           |
+-----------+  +-----------+

+-----------+
| SELECT    |
| A         |
| FIELD     |
+-----------+

+-----------+  +-----------+
| SAVE      |  | EDIT      |
| THIS      |  | T.P.      |
| PAGE      |  | PAGES     |
+-----------+  +-----------+
```

COMMENT: PAGE TYPE 4 (TRAIN PAGE)

THESE PAGES = 55 & 56   1986-11-07-10:18:14

	NAMES	INT.	CABLE	DELAY
START	AX-RF/P		30	
PULTR	BX-TD		2	0
RF-TR	BX-TFEJ		1	0
CLOCK		1		0
PLSTR	HX-TPLS		3	
PLSLN	ALL		-1	
	A		41	
	B		42	
START	PX-EPC		25	
PULTR	PX-BD1		4	0
RF-TR	PX-TRF		2	0
CLOCK		1		0
PLSTR	BX-TPLS		1	
PLSLN	ZERO		1	
	CION		41	
	CFAST		42	

```
+-----------+  +-----------+
| PAGE      |  | MACHINE   |
| TYPE      |  | PS        |
| 5         |  | PSB       |
+-----------+  +-----------+

+-----------+  +-----------+
| READ      |  | CHANGE    |
| A         |  | MACHINE   |
| PAGE      |  |           |
+-----------+  +-----------+

+-----------+
| SELECT    |
| A         |
| FIELD     |
+-----------+

+-----------+  +-----------+
| SAVE      |  | EDIT      |
| THIS      |  | T.P.      |
| PAGE      |  | PAGES     |
+-----------+  +-----------+
```

PAGE: 55   MACHINE: 0 ← PS machine

PAGE: 56   MACHINE: 1 ← Booster machine.

COMMENT: PAGES TYPE 5 (TWO PAGES ARE DISPLAYED TOGETHER)
(GLOBAL PAGES)

The first type 5 page must be in range 51 to 100 whereas the second must be in range 101 to 150.

For each page type the authorized fields for the edition are displayed in green.

The other restrictions are given in paragraph 3 (Error messages and general messages meaning).

2.2.2) Action on USER TOUCH PANEL

```
+-------------------------------------------------------+
|                                                       |
|      +---------+    +---------+    +---------+         |
|      |  LIST   |    |  LIST   |    |  READ   |         |
|      |  EMPTY  |    |  FULL   |    |   A     |         |
|      |  PAGES  |    |  PAGES  |    |  PAGE   |         |
|      +---------+    +---------+    +---------+         |
|                                                       |
| +------+    +---------+    +---------+    +---------+  |
| |      |    |  LIST   |    |  COPY   |    |  LIST   |  |
| | HELP |    |  START  |    |  THIS   |    |  PLS    |  |
| |      |    |  PULSES |    |  PAGE   |    | LEXICON |  |
| +------+    +---------+    +---------+    +---------+  |
|   +-------------------------------------------------+ |
|   |    TO STOP PROGRAM, PRESS 'STOP'               | |
|   +-------------------------------------------------+ |
|   |     +---------+    +---------+                    |
|   |     | CHANGE  |    | DELETE  |                    |
|   |     | START   |    | THIS    |                    |
|   |     | NAME    |    | PAGE    |                    |
|   |     +---------+    +---------+                    |
|   |                                                   |
| +------+                                              |
| |      |                                              |
| | STOP |                                              |
| |      |                                              |
| +------+                                              |
+-------------------------------------------------------+
```
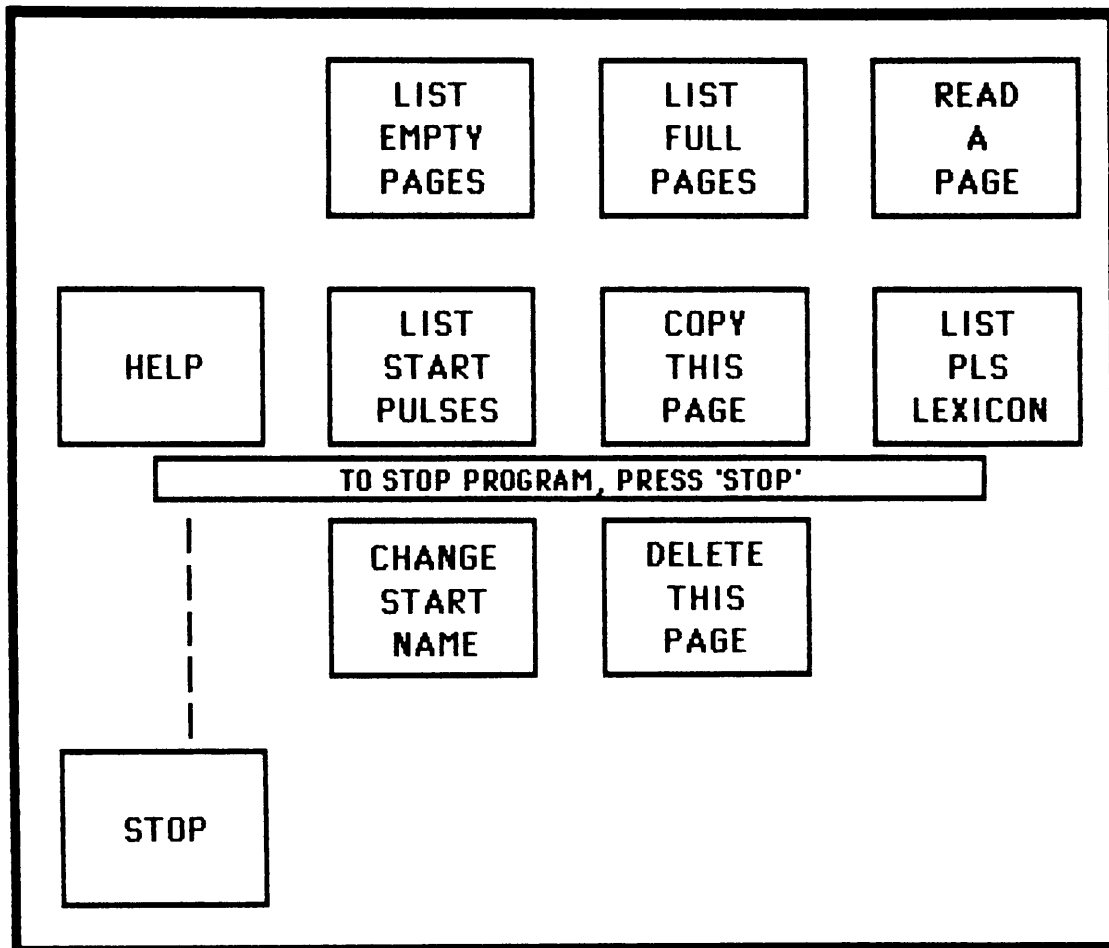
* LIST EMPTY PAGES: Lists on black & white TV 3 the 220 first empty trigger default pages.

* LIST FULL PAGES: Lists on black & white TV 1 the full trigger default pages.

* READ A PAGE: Reads a touch panel page. If the page to be read is empty, the page type (3, 4 or 5) must be given.

* HELP: Displays another user touch panel for decoding page types and button types. The tracker ball is disabled during this operation (press back on the newly displayed touch panel for returning in edition mode).

* LIST START PULSES: Lists on black & white TV:
- N° 1: the START TRIGGER pulses,
- N°2: the STANDARD TRAIN pulses,
- N°3: the RF TRAIN pulses,
- N°4: the PLS TELEGRAM.

* COPY THIS PAGE: Copies the currently displayed page on a specified page. If the specified page is not empty a confirmation must be given.

A type 3 page can be copied on types 3 & 5 pages.

A type 5 page can be copied on types 5 & 3 pages.

A type 4 page can only be copied on a type 4 page.

* LIST PLS LEXICON: Lists the PLS lexicon for the current machine. If type 5 pages are displayed, the PLS lexicons for the two pages are listed.

* CHANGE START NAME: Allows the operator to modify the actual name of a START pulse in the STARTPULSE:DATA file. This must be done in co-operation with the concerned hardware specialist.

* DELETE THIS PAGE: Deletes the currently displayed page. If type 5 pages are displayed the two pages are deleted.

* STOP: Stops the program.

LIST OF FULL TRIG. DEF. PAGES   1986-11-07-09:49:05

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	24	25	26	27				

COMMENT: LIST FULL TRIGGER DEFAULT PAGES (Example)

FIRST 220 EMPTY TRIG. DEF. PAGES   1986-11-07-09:48:52

23	28	29	30	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	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	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	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	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	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
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

COMMENT: LIST EMPTY TRIGGER DEFAULT PAGES (Example)

STARTPULSE:DATA   START TRIGGER ARRAY   1986-11-07-09:56:43

CABLE	NAME	CABLE	NAME	CABLE	NAME
1	BX-RFT	18	PX-WTR	35	PX-SF800
2	LX-SIP	19	PX-RTR	36	PX-WLP
3	BX-RBI	20	PX-STC	37	BX-FEJ
4	BX-STBD	21	AX-ACO	38	HX-RSTO
5	BX-WBP	22	PX-EBI	39	AX-OUAD
6	BX-WBC	23	PX-ELFT	40	AX-FAST
7	HX-TPG	24	AX-SHU	41	HX-WEJ
8	BX-WIO	25	PX-EPC	42	HX-RPB
9	BX-WI1	26	PX-O16		
10	BX-WI2	27	PX-O58		
11	BX-WI3	28	PX-074		
12	HX-FEJ	29	PX-092		
13	BX-WML	30	AX-RF/P		
14	BX-WPI	31	PX-074		
15	BX-WEJ	32	PX-OI150		
16	HX-RHC	33	PX-O26		
17	HX-RAC	34	PX-042		

COMMENT: START TRIGGER SET

STARTPULSE:DATA   STANDARD TRAIN ARRAY   1986-11-07-09:56:43

CABLE	NAME	CABLE	NAME	CABLE	NAME
1	BX-TDBC				
2	BX-TD				
3	PX-TBDO1				
4	PX-BD1				
5	PX-TBUO1				
6	PX-TBU1				
7	PX-TCX				
8	HX-TCL				
9	HX-TPG				

COMMENT: STANDARD TRAIN SET

STARTPULSE:DATA   RF TRAIN ARRAY   1986-11-07-09:59:49

CABLE	NAME	CABLE	NAME	CABLE	NAME
1	BX-TFEJ				
2	PX-TRF				
3	PX-TRV				
4	HX-TREV				

COMMENT: RF TRAIN SET

STARTPULSE:DATA   PLS TELEGRAM ARRAY   1986-11-07-09:59:49

CABLE	NAME	CABLE	NAME	CABLE	NAME
1	BX-TPLS				
2	PX-TPLS				
3	HX-TPLS				

COMMENT: PLS TELEGRAM SET

PS PLS LINES LEXICON   DATE: 1986/NOV/07   TIME: 14:10:08

1-16	17-32	33-48	49-64	65-80	81-96	97-112	113-128
HEOP 16	MISC.	USER	HARM.NB	H.E W-P	C.L. SP	C.L. OP	SP.COND
\ZERO	NPBAR	SFT	420	HEA	SPNPB	LC1 ·	..113
CT	BSM	SPP	20	HEB	NRFTA	LC2	..114
FE16S	...19	AA	20LI	HEC	DIREC	LC3	SIMUL
FE16D	FE26	TST	19-21	HEMD	C=2.4	LC4	PGSPA
FE16A	D48	MD	10	HEE	C=1.2	LC5	PGDMP
FI16A	D47	PHY	6-12	NOHE	NRATP	BOUCL	ALL-C
FE16L	FI42	SPN	240	...71	INJLI	..103	VETO
....8	FI42D	LEA	HY	...72	SPP6	EJLI	ALL
HE 58+.	DEST.16	CYC.TYP	L.E W-P	PARTICL	C.L. SP	C.L. OP	CYC NO
FE58L	D2	A	LELOW	PROT	NR16S	AATEJ	CYP 0
FE58S	D3	B	LELEC	ANTIP	APTST	AATIJ	CYP 1
FE58D	...27	C	LEHIG	DEUT	UNSTA	REINJ	CYP 2
...12	FTS	D	LEDEC'	OXY	SPP20	ATP	CYP 3
SE62	FTA	E	LEMD	ELEC	NODMP	SPION	CYP 4
...14	ATPA	CYC.6	...62	POSIT	SPN6	H.20	CYP 5
PBAR	ATPP	SW-4	...63	ALPHA	SM.DP	H6/10	CYP 6
-RT-	...32	SW-8	...64	...80	\IP=0	H20	CYP 7

COMMENT: PLS TELEGRAM FOR PS AND AA MACHINES

BOOSTER PLS LINES LEXICON   DATE: 1986/NOV/07   TIME: 14:13:18

1-16	17-32	33-48	49-64	65-80	81-96	97-112	113-128
OPER	MISC.	USER	INT.LEV	EJECT.	C.L. EJ	C.L. OP	SP.COND
\ZERO	NO-EJ	SFT	ILOW	20B	UPS20	'17	--113
----2	PASSR	SPP	IION	10B	UML20	'18	--114
----3	SCRH	AA	IHIGH	20BME	UPS10	PS.ML	SIMUL
----4	SCRV	TST	IME	10BME	UML10	'20	PGSPA
----5	---21	MD	IMAX	---69	UPSM2	'21	PGDMP
----6	1-GEV	PHY	I--54	---70	UMLM2	'22	ALL-C
----7	FLAT	ME1	I--55	---71	UPSM1	'23	VETO
----8	PARAB	ME2	I--56	---72	UMLM1	'24	ALL
LI-DEST	BO-DEST	CYC.TYP	WORK.PT	PARTICL	C.L. SP	C.L. OP	CYC NO
PS50	PS	CION	QLOW	PROT	NOCFL	'25	CYB 0
PSB	ML	CFAST	QHIGH	---74	ME12	'26	CYB 1
EL	---27	CFLAT	QME	DEUT	W.BC-	'27	CYB 2
SL	---28	CSPEC	QMAX	OXY	W.BP-	'28	CYB 3
---13	---29	CME	QION	ALPHA	W.ML-	'29	CYB 4
---14	---30	C----	Q--62	---78	SL.EL	'30	CYB 5
---15	---31	C3	Q--63	---79	ZR.DP	'31	CYB 6
---16	---32	CZERO	Q--64	---80	\TCLP	'32	CYB 7

COMMENT: PLS TELEGRAM FOR PSB AND LINAC MACHINES

PAGE TYPE MEANING   1986-11-06-11:51:51

TYPE 0: MENU PAGE
        GENERAL PURPOSE PAGES IN WHICH EACH BUTTON CAN PERFORM
ANY ACTION (I.E.:CALL OTHER PAGES, SET SPECIAL TRIGGERS, CHOOSE
THE MACHINE).

TYPE 1: START PAGE
        CONTAINS ONLY TYPE 13 BUTTONS.

TYPE 2: PLS PAGE
        CONTAINS ONLY TYPE 11, 12, 14 & 15 BUTTONS

TYPE 3: DEFAULT PAGE
        CONTAIN A FIXED SET OF INFORMATION.

TYPE 4: TRAIN PAGE
        ONLY THE PULTR FIELD IS MEANINGFUL IN THAT CASE

TYPE 5: GLOBAL PAGE
        THEY CONTAIN THE SAME SET OF INFORMATION AS A DEFAULT
PAGE. EACH GLOBAL PAGE IS RELATED TO ACORRESPONDING PAGE IN THE
SOS PAGE DATA BASE.

COMMENT: HELP: DECODE PAGE TYPE

BUTTON TYPE MEANING   1986-11-06-11:51:54

TYPE 1 : IF PUSHED ANOTHER PAGE WILL BE DISPLAYED.
TYPE 2 : DISPLAYS THE FIRST PLS PAGE FOR THE CHOSEN MACHINE.
TYPE 3 : DISPLAYS THE FIRST START PAGE FOR THE CHOSEN MACHINE.
TYPE 4 : SELECTS THE PULSE TRAIN FOR THE CHOSEN MACHINE.
TYPE 5 : COPIES THE SETTINGS FROM ONE T-P SIDE TO THE OTHER.
TYPE 6 : IF PUSHED THE CORRESPONDING ACCELERATOR IS CHOSEN.
TYPE 7 : SELECTS THE CORRESPONDING CLOCK INTERVAL.
TYPE 8 : IF PUSHED THE CORRESPONDING RF TRAIN IS SELECTED.
TYPE 9 : IF PUSHED THE PROGRAM TRIGSIP IS RESTARTED.
TYPE 10: IF PUSHED THE PROGRAM ANASIP; IS RESTARTED.
TYPE 11: IF PUSHED UP TO 3 PLS LINES CAN BE SELECTED TOGETHER.
TYPE 12: IF PUSHED THE CORRESPONDING PLS LINE IS SELECTED.
TYPE 13: IF PUSHED THE CORRESPONDING START PULSE IS SELECTED.
TYPE 14: IF PUSHED THE SUITE PAGE IS DISPLAYED.
TYPE 15: IF PUSHED THE HOME PAGE IS DISPLAYED.

COMMENT: HELP: DECODE BUTTON TYPE

3) Error messages and general messages meaning

3.1) Error messages

ER 1: PLEASE ENTER THE BUTTON ARGUMENT
You tried to quit the touch panel button edition without editing the button argument.

ER 2: INCOHERENCE BETWEEN BUTTON TYPE AND BUTTON LEGEND
For some button types the legend can't be changed. If you enter once more the button type, the default button legend will be set.
See page A2-6 for the autorized legend for your situation.

ER 3: WRONG BUTTON ARGUMENT
In this situation, the button argument is out of range (see page A2-6).

ER 4: YOU CANNOT MODIFY A PLS LINE LEGEND
The PLS line names are not managed by this program, which only reads the names for a given button argument (here the cable number).

ER 5: BUTTON TYPE 12 MUST BE IN PAGE TYPE 1
A PLS line name (button type 12) can only be in a PLS page (page type 1).

ER 6: YOU CAN'T DELETE THE HOME PAGE
The home page is the first called page at program start. You can modify this page but not delete it.

ER 7: YOU CAN'T COPY A PAGE ONTO THE HOME PAGE
The home page is protected against that operation, but you can modify it.

ER 8: PAGE TYPE MUST BE 0, 1 OR 2
In this mode you can only edit a trigger touch panel page:
- page type 0 : menu page
- page type 1 : PLS page
- page type 2 : start page

For editing a type 3, 4 or 5 page, select the "EDIT DEFAULT DATA" button with the tracker ball.

ER 9: PAGE TYPE MUST BE 3, 4 OR 5
In this mode you can only edit the trigger default parameters:
- page type 3 : default page
- page type 4 : train page
- page type 5 : global page

For editing a type 0, 1 or 2 page, select the "EDIT T.P. PAGES" button with the tracker ball.

ER 10: YOU MUST READ A PAGE FIRST

The picture displayed on the colour screen is only the general page for editing the default parameters.

Select the button "READ A PAGE" with the tracker ball or press that button on the user touch panel.

ER 11: A TYPE 4 PAGE CAN'T BE COPIED ONTO A TYPE 5 PAGE

If you want to copy this type 4 page you must give a page number lower than 51. (51 is the first type 5 page number).

ER 12: THE GREATEST GLOBAL PAGE NUMBER IS 100

The global pages (type 5) are coupled and begin at number 51.

For example page 51 is associated with page 101,
            page 52 is associated with page 102,...
            page 100 is associated with page 150.

You always have to read the first'one of the two type 5 coupled pages.

The default pages (type 3) & train pages (type 4) must always be in the range 1 to 50.

ER 13: THE LOWEST GLOBAL PAGE MUST BE 51

See the error 12 comment.

ER 14: THE MACHINE NAME IS TOO LONG (UP TO 7 CHARACTERS)

You can enter an up to 7 characters string for the machine name.

ER 15: WRONG BUTTON PLACE (FROM 1 TO 8 ONLY)

A PLS line button can only be implanted at position 1 to 8 (the 2 upper button lines).

ER 16: WRONG BUTTON PLACE (FROM 8 TO 12 ONLY)

The places 1 to 8 are specially reserved for PLS line buttons (page type 1) or START buttons (page type 2).

Try to implant your button at position 8 to 12.

ER 17: BUTTON TYPE 13 MUST BE IN PAGE TYPE 2

A START pulse name (button type 13) can only be in a START page (page type 2).

ER 18: BUTTON TYPE "Button N°" CAN'T BE IN PAGE TYPE 1

In type 1 pages you can only find:
        - PLS buttons at positions 1 to 8
        - HOME, SUITE & STACK buttons at positions 9 to 12
        - The type 12 "ALL" button at one of the 9 to 12 positions.

ER 19: BUTTON TYPE " Button N°" CAN'T BE IN PAGE TYPE 2

In type 2 pages you can only find:
- START buttons at the places 1 to 12
- HOME & SUITE buttons at the places 9 to 12.

ER 20: YOU CAN'T MODIFY A START PULSE LEGEND

If you want to set another start pulse name in this page, you must enter a different button argument (press the button "LIST START PULSES on user touch panel) and choose a cable number: the corresponding button legend will be set.

If you want to modify a start name for a given cable number, select "EXIT ⁄ THIS BUTTON" and press "CHANGE START NAME" on user touch panel.

ER 21: TIP ERROR: "COCO"

System error : please consult a software specialist.

3.2) Information messages

MES 1: ** NO SUCH PAGE (YET) **

You read a non-existant page: the program will create and display it.

MES 2: ** NO ACTION **

You are informed that the started action is well interrupted.

MES 3: ** WARNING: THE PAGE "PAGE N°" IS NOT EMPTY **

You are informed that you tried to copy a page onto a full page. Confirm by "YES" or "Y" if you want to continue or enter "NO" if you want to abort this action.

MES 4: ** YOU CAN'T USE THE COPY BUTTON NOW **

You can't copy a button in a type 2 or 3 page.

MES 5: ** MODIFICATION OK **

You are informed that the START pulse name modification worked out.

MES 6: ** YOU CANNOT USE THE TRACKER BALL NOW **

The help messages functions are overlayed in the program function area. You cannot use the tracker ball, if you want to quit: press "BACK" on user touch panel.

MES 7: ** TRANSFER FAILED **

You tried to save the program and the file transmission failed. Your last modifications (add a new machine) are not saved. Try to execute the block 92, or call a software specialist.

MES 8: ** TRANSFER OK **

Your modifications are saved.

MES 9: ** PAGE-EDIT-SERGE SAVED ON (SOS-TREE) **

Your modifications of the program are saved on a nodal file.

Please update also the symbolic source file on the PRDEV computer:
<PRDEV>(SOS-TREE)NOD-TRIGED-MAIN:SYMB.

MES 10: ** YOU HAVE A SECOND CHANCE TO SAVE THIS PAGE **

You tried to quit this page without saving the last modifications.

MES 11: ** BYE-BYE **

End of TRIGGER PAGE EDITOR program.

MES 12: ** 2 TYPE 5 COUPLED PAGES WILL BE CREATED **

You read a none existant page which number is greater than 50 and you are informed that two type 5 coupled pages are created.

See also the ER 12 comment.

MES 13: ** THE PAGE WILL BE COPIED ONTO A TYPE 3 PAGE **

You are informed that your type 5 page (which number is greater than 50) will be copied onto a type 3 page (which number is lower than 51).

MES 14: ** THE PAGE WILL BE COPIED ONTO A TYPE 5 PAGE **

You are informed that your type 3 page (which number is lower than 51) will be copied onto a type 5 page (which number is greater than 50).

IV) PROGRAMMERS GUIDE

1) The SOS TREE TRIGGER PAGE EDITOR package.

Program author:

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Student from the university of technology of compiegne (FRANCE).

Maintenance:

See Luigi CASALEGNO, CERN, DIV. PS, GR. CO

Source languages:

NODAL : for the general program.
P-PLUS : for the trigger data base access routines.

NODAL source files:

MAIN PROGRAM   : <PRDEV>(SOS-TREE)NOD-TRIGED-MAIN:SYMB
Contains the main trigger page editor program.

VARIABLES   : <PRDEV>(SOS-TREE)NOD-TRIGED-VAR:SYMB
Contains the constants and the variables of the program. They are pre-initialized and loaded when the program starts.

GLOBAL FUNCTIONS : <PRDEV>(SOS-TREE)NOD-TRIGED-FUNC:SYMB
Contains the defined functions for general use. These function are loaded in the defined function area when the program starts.

HELP FUNCTIONS   : <PRDEV>(SOS-TREE)NOD-TRIGED-HELP:SYMB
Contains the defined help functions. These functions are overlayed on the defined function area when the "HELP" button is pressed on the user touch panel. When the "BACK" button is pressed on the user touch panel the previous functions are re-loaded.

P-PLUS source files:

FILE ACCESS   :<PRDEV>(SOS-TREE)PPL-TRIG-PULSE:SYMB
Contains the STARTPULSE:DATA file access routines.

GLOBAL VARIABLES :<PRDEV>(SOS-TREE)PPL-TRIG-GLOBAL:SYMB
Contains the global variables for all the trigger data base access routines
written in P-PLUS.

Backup source: Floppy   (TRIG-EDIT:SOS-TREE)

2) **The defined functions.**

2.1) Global functions.

For more explanations (concerning the parameters and the calling
sequences) see the source file: <PRDEV>(SOS-TREE)NOD-TRIGED-FUNC:SYMB.

ACMENU: Specific trigger editor function: General access to a trigger
touch panel page in the TRIGMENU:DATA file or read/write access to the
TRIGMENU:DATA directory.

ACTRIG: Specific trigger editor function: General access to a trigger
default page in the TRIGDEF:DATA file or read/write access to the
TRIGDEF:DATA directory.

BDECOD: Specific trigger editor function: Transforms a packed button
legend in the corresponding string or transforms a button string legend in the
corresponding packed array.

DELPAD: Specific trigger editor function: Deletes a trigger default page
in the TRIGDEF:DATA file.

DELPAG: Specific trigger editor function: Deletes a trigger touch panel
page in the TRIGMENU:DATA file.

BSBUTT: Specific trigger editor function: Displays a button with a
legend, eventually the next page number to be called (when the operator
selects the "MOVE DOWN TREE" button with the tracker ball), in a given colour.

FINDNX: Specific trigger editor function: Finds the next touch-panel pages which are called by the presently displayed page.

FIPLS: Specific trigger editor function: Effects a remote call to PLS computer for the purpose of reading a PLS LINE name.

FIPUL: Specific trigger editor function: General access to the STARTPULSE:DATA file.

FRAM1: Specific trigger editor function: Displays the general trigger touch panel page on the colour screen.

FRAM2: Specific trigger editor function: Displays the general trigger default page on the colour screen.

LEMPTY: Specific trigger editor function: Lists the empty (touch-panel or default) pages on black & white TV 3.

LFULLP: Specific trigger editor function: Lists the full (touch-panel or default) pages on black & white TV 1.

OPTION: Specific trigger editor function: Displays special buttons on the user touch panel.

PAD: String function: Pads a string to a given length.

RMENU: Specific trigger editor function: Reads a trigger touch panel page in the TRIGMENU:DATA file.

RWDIR: Specific trigger editor function: Read/write access in the TRIGMENU:DATA file.

SASK: String function: Accepts a string from the colour TV screen; displays a default string and a prompt in a given colour.

STRARR: String function: Transforms a packed array into a string or transforms a string into a packed array.

STRVAL: String function: Transforms a value in the corresponding string.

SWAP: Standard function: Swaps the two given reference arguments.

TINDOW: Standard function: Trace a rectangle on the colour screen in a given colour.

TITLE: Specific trigger editor function: Transforms the packed page title into a string or transforms the page title string into a packed array.

VASK: Standard function: Accepts a value from the colour TV screen; displays a default value and a prompt in a given colour; checks for min and max value.

WMENU: Specific trigger editor function: Writes a trigger touch panel page in the TRIGMENU:DATA file.

2.2) Help functions.

HELP1: Specific trigger editor function: Displays informations about page type.

HELP2: Specific trigger editor function: Displays informations about button type.

HELPT: Standart function: Displays help buttons on user touch panel or branches to chosen help function.

3) <u>The ICCI trigger data base access routines.</u>

The following routines have been implemented in P-PLUS to access all the trigger data files in the TREES computer.

TRMEN: Accesses the file TRIGMENU:DATA

TRMND: Accesses the directory of the file TRIGMENU:DATA

TRDDEF: Accesses the file TRIGDEF:DATA

TRDFD: Accesses the directory of the file TRIGMENU:DATA

TRPUL: Accesses the file STARTPULSE:DATA

In nodal the routines have the following calling sequences:

TRMEN(COMM.,PAGE.,L,C)
TRMND(COMM.,DIR.,C)
TRDEF(COMM.,PAGE.,L,R,C)
TRDFD(COMM.,DIR.,C)
TRPUL(COMM.,SET.,CABLE.,C)

Where:
COMM. is the action to be performed:
0: close file
1: open for read only
2: open for read/write
3: read
4: write
5: delete
6: trace,
PAGE. is the page number,
L is an integer array containing the data belonging to 1 page,
DIR. is an integer array containing the directory of the file,
R is a real array containing the real values of a TRIGDEF page,
SET is the PULSE table number,
CABLE. is the pulse cable number,
C is the completion code.

REFERENCES

SOS Doc 1: Overview of the SOS.
       J. Kenaghan   PS/CO/Note 82-31

SOS Doc 2: SOS interactive program (SIP).
       J. Kenaghan   PS/CO/Note 82-32

PROGRAM LISTINGS

See Luigi CASALEGNO, CERN, DIV. PS, GR. CO

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