national accelerator laboratory

0280
TM 155

NOTES ON THE COMPONENT IDENTIFICATION PROBLEM

R.P. Featherstone

February 10, 1969

1. It is necessary to have a simple and unambiguous designation for every major part of the linac. These designations will be used on drawings, in cabling lists, and in communicating with the computer. They will also be used by operators, physicists, engineers, and technicians in communicating with each other. If too complex a system is chosen, it will be ignored by everyone who can possibly do so. If the system chosen is simple to learn, it will be widely used.

2. Continental Electronics is supplying a major part of our prototype equipment. Since we have not specified a numbering and naming procedure, they are using one of their own choice, based on MIL-STD-16C (and now ASA Y32.16). A typical one of their designations is A2A1A3, the surge resistor assembly of the electronic pulse switch of the high-level pulse modulator. Some of their designations go further: A2A1A1A1 is the driver keyer of the driver switch of the electronic pulse switch of the high-level pulse modulator. If we adopted their scheme, we could add a level before their designations which would specify the number of the system, presumably by the number of the associated accelerating cavity: A4A2A1A3 would be the surge resistor assembly referred to before, for the rf system of tank 4. Incidentally, the letters in the samples above serve only as dividers. However, one may go on past the designators so far given in order to refer to a particular part within an assembly, and in this case the familiar part designation letters are used: A4A2A1A3R2 would be the second resistor in the surge resistor assembly.

3. It is probably safe to say that this scheme of designation has only the merit of being easy to expand indefinitely. It is clumsy, tends to be confusing to read, and gives absolutely no mnemonic aid to the user except for the letter that designates the type of part being referred to. Incidentally, we need not hesitate to adopt a naming scheme radically different from Continental's, even to the extent of using it on Continental's circuit diagrams. I am sure that we shall be redrawing every one of Continental's schematics within a few months. The process has already begun, even before any equipment has been received, because the present diagrams are so difficult to understand.

4. Another scheme that is in limited use here is that chosen by Elton Anderson for referring to the parts of the linac in his point lists. He designates systems as follows:

INS	Ion source
HVS	High voltage power supply (800 kV)
BTS	Beam transport and diagnostics (0.75 MeV)
BCH	Buncher
FSM	Focusing and steering magnets
RFS	Radio frequency system
TNK	Tank (accelerating cavity)
QPS	Quadrupole pulser power supply
BMD	Beam diagnostics (10 MeV)
WAT	Water system
VAC	Vacuum system
ENV	Environmental systems

5. It is obvious that one could add a number after Anderson's letter groups to distinguish each of several similar units: TNK1, TNK2, TNK3, etc.

6. A more highly developed identification scheme is in use at Los Alamos. They use six characters in three fields

separated by spaces: the first field designates the geographical area in which the device is located, the second field identifies the type of device, and the third field is a two-digit device number. Adapting their techniques to our situation, one possible group of geographical designators is:

B0	Beam transport area between injector and Tank 1
B1	Beam transport area between Tank 1 and Tank 2
B2	Beam transport area between Tank 2 and Tank 3
.	
.	
B9	Beam transport area between Tank 9 and Linac-Booster interface.
E0	Equipment area (upper building level) near the injector
E1	Equipment area for Tank 1 (contains rf system, etc.)
E2	Equipment area for Tank 2
.	
.	
E9	Equipment area for Tank 9 and on to end of building.
IC	Injector column, including the ion source and other parts within the re-entrant structure
IE	Injector enclosure (all but high-voltage terminal and column)
IH	Injector head (high-voltage terminal house)
LC	Linac control room
T1	Tank 1 and auxiliaries
.	
.	

T9	Tank 9 and auxiliaries
U0	Utility area (lowest building level) adjacent to injector
U1	Utility area adjacent to Tank 1
U2	Utility area adjacent to Tank 2
.	
.	
U9	Utility area adjacent to Tank 9 and on to the end of the building.

7. Similarly, one may adapt their technique of device identification to our device list. One available listing of the LAMPF' device codes contains 72 items, and it is known that other codes have been added since. An examination of their codes suggests that in some cases the fact of their being confined to two letters has made it uncomfortably difficult to choose codes that have good mnemonic properties: AW for a water flow control valve, for example. We probably can get better mnemonics using three characters, and parmitting use of a blank as an alternate character. For example, the classes of water valves:

WVM	Water valve, manual (or MWV, manual water valve)
WVS	Water valve, solenoid operated
WVA	Water valve, air operated
WVC	Water valve, flow control
WPR	Water pressure regulator
WCK	Water check valve
WRV	Water relief valve (or, if preferred, WVR, Water valve, relief)

8. Here are a few complete component identifications as they might appear if we chose a system similar to the Los Alamos one:

The quadrupole magnet in the tenth drift tube of tank 2: T2-DTQ-10

The sixth drift-tube quadrupole magnet power supply for Tank 1: E1-DQS-6