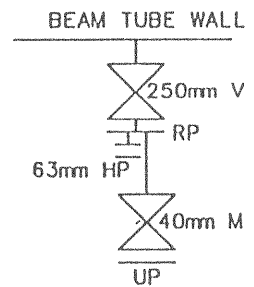
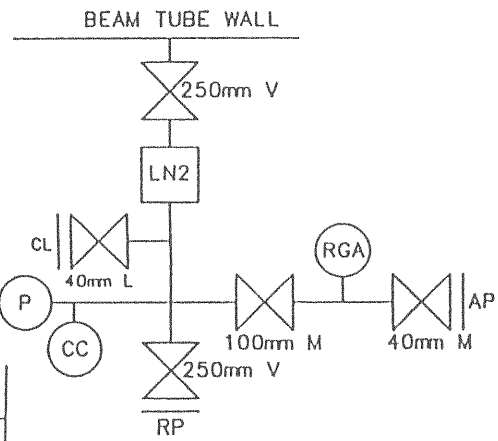


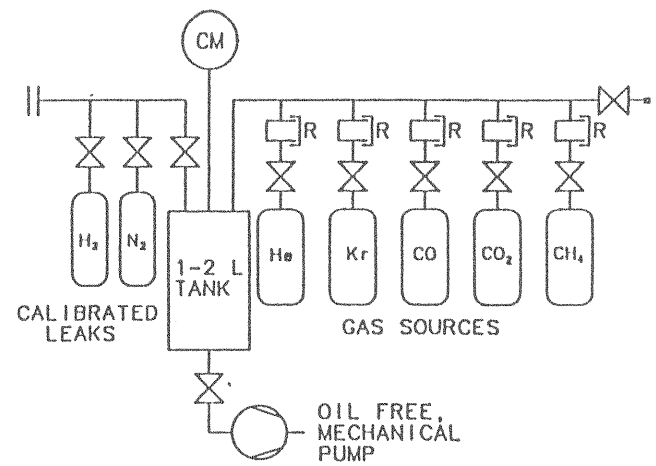
PUMP PORT HARDWARE

TYPE B: FOR PORTS DURING
 BAKE & LEAK CHECK
 10 UNITS REQUIRED, INCLUDING
 1 SPARE

TYPE H: FOR PORTS DURING HOLD
 (AFTER ACCEPTANCE,
 BEFORE OPERATION)
 75 UNITS REQUIRED: 36 PER SITE,
 PLUS 3 SPARES



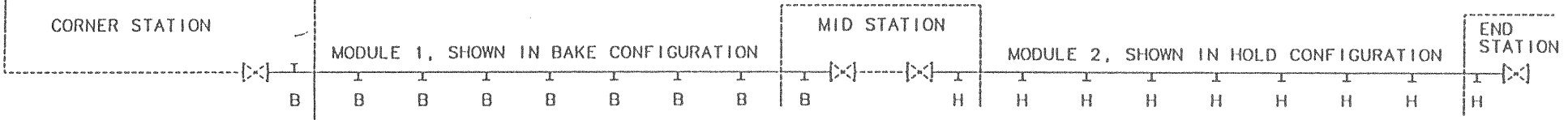
PORTABLE CALIBRATION MODULE



LEGEND FOR PUMP PORT HARDWARE:

- AP: BLANKED PORT FOR AUXILIARY TURBO PUMP
- CC: COLD CATHODE GAUGE
- CL: BLANKED PORT FOR CALIBRATED LEAKS
- CM: CAPACITANCE MANOMETER GAUGE (ABSOLUTE)
- G: BOURDON GAUGE
- HP: BLANKED PORT FOR RGA HEAD INSTALLATION
- LN2: LIQUID NITROGEN TRAP, 1 M² COLD SURFACE
- L: VARIABLE LEAK VALVE
- M: METAL SEALED VALVE
- P: PIRANI GAUGE
- R: REGULATOR WITH DUAL GAGES
- RGA: THE FOLLOWING SYSTEM OR ITS EQUIVALENT: BALZERS QMG 421-1 (MASS RANGE 1-100, CONSISTING OF QMS 421-1, QUADSTAR 421, QMA 125 WITH GRID ION SOURCE 110V AND SEM 90 DEG OFF AXIS/FARADAY) PLUS IC 421 ION COUNTER, CP 400 ION COUNTER PREAMPLIFIER, AND QAM ANALYSIS MATRIX SOFTWARE
- RP: BLANKED PORT FOR ROOTS AND TURBO PUMPS
- TP: BLANKED PORT FOR TURBO PUMP
- UP: BLANKED PORT FOR UTILITY PURPOSES
- V: VITON SEALED VALVE (VITON SEALS ARE PARKER O-RINGS, PRE-BAKED)

NOTE THAT PUMP PORTS
 AT MODULE ENDS AT THE
 CORNER STATION ARE
 POSITIONED ON THE
 INBOARD SIDE OF THE
 ANGLE BETWEEN THE
 BEAM TUBE ARMS.



PLAN VIEW OF ARM AT HANFORD SITE, SHOWING TYPES OF HARDWARE AT EACH PUMP PORT

DO NOT WRITE IN THESE SPACES		LIGO PROJECT	
DATE	1/28/95	BEAM TUBE PUMP PORT HARDWARE	
CDR			
ENG			
APP			
NO. 1118	10950027		