

## Preliminary documentation

1. Cornell's Request for Quote for Pointing System  
Vertex Proposal  
Purchase Order  
Acceptance Test Plan
2. Final Design Review
3. Final Design Report, Ed. 1.0, August 95  
Schedule  
Drawing Tree  
Mechanical Design  
Analysis/Simulation (not included in final delivered documentation)  
Servo Concept  
Servo Design  
LAN Interface  
Cable Diagram

## Final Delivered Documentation

4. Volume 1 Mechanical Handbook Rev 2.1 Sept 97  
Section 1.1 General  
Section 1.2.1 Drawing Tree and Table  
Section 1.2.2 Azimuth Drive  
Section 1.2.3 Azimuth Encoder  
Section 1.2.4 Elevation Drive  
Section 1.2.5 Elevation Drive Support  
Section 1.2.6 Elevation Encoder  
Section 1.2.7 Final Limits Mount, Elevation Drive  
Section 1.2.8 Collision Avoidance Mechanism  
Section 2.1 Installation Azimuth Drive  
Section 2.2 Installation Azimuth Encoder  
Section 2.3 Installation Elevation Drive  
Section 2.4 Installation Elevation Encoder  
Section 2.5 Installation Final Limits Mount, Elevation Drive  
Section 2.6 Installation Collision Avoidance Mechanism  
Section 3.1 General Maintenance  
Section 3.2 Inspection and Maintenance Work  
Section 3.3 Maintenance Schedule  
Section 3.4 Vendor Information
5. Volume II - Operation & Maintenance Manual  
Section 1, Operation, Maintenance & Troubleshooting, Rev. 2.2, Sept.97  
Section 2, LAN Interface Description, Rev. 2.2, Sept.97  
Section 3, PLC Description of Internal Interfaces, Rev. 2.2, Sept.97  
Section 4, Modifications and Adjustments, Rev. 2.2, Sept.97
6. Volume III - Installation Manual (Wiring Diagrams), May 97 with Sept. 97 updates  
Drawing 950432  
PD ( Power Distribution) 29 Sheets  
AZ (Azimuth) 23 Sheets  
GD (Gregorian Dome) 22 Sheets  
CH (Carriage House) 22 Sheets

- CC (Control Cabinet) 2 Sheets
  - PLC (Programmable Logic Controller) 66 Sheets
  - Drawing 950343, List of Parts, 14 Sheets
  - Drawing 950344, Interconnection Diagram (Wire List) 69 Sheets
  - Drawing 950345, Cable List, 15 Sheets
  - Drawing 950346, Cable Diagram, 7 Sheets
  - Drawing 950348, Control Cabinet Layout, 2 Sheets
7. Volume IV.1 Vendor Publications, File 1, Rev. 2.0, May 1997
- Section 1.1, Manual for, Siemens Simatic S5-135U PLC
  - Section 1.2, Manual for CPU928B
  - Section 1.3, Manual for CP581
  - Section 1.4, Manual for CP524/COM525
  - Section 1.5, Position Measuring Module WF705
  - Section 1.6 LAN Interface Module
  - Section 1.7, Time Code Reader
  - Section 2.1, Data Sheets Kollmorgen Motors B604 & B606
  - Section 2.2, Manual for Amplifier BDS4A
  - Section 2.3, Technical Data for Maccon Regeneration Module
  - Section 3.1, Encoders
  - Section 4, Vertex Portable Control Unit (PCU)
  - Section 5.1, Stromag Rotary Cam Limit Switches
  - Section 5.2, Schmersal Limit Switches
  - Section 6, Vertex Drive Control System "DCS" (Analog Circuitry)
  - Section 6.1, Vertex DCS for Azimuth/Gregorian Dome
  - Section 6.2, Vertex DCS for Carriage House
8. Volume IV.2 Vendor Publications, File 2, Rev. 2.0, May 1997
- Section 7, Uninterruptable Power Supply (UPS)
  - Section 8, Switchgear Inside Drive Cabinet
  - Section 8.1 Dold Voltage Supervision Relays
  - Section 8.2, Pilz Current Relays
  - Section 8.3 Schiele Over voltage Protection Relay
  - Section 8.4, Misc. Components
9. Volume V.1 Software Documentation - PLC Software Rev.2.0 Dec. 99 (Andy's copy)
- Spiral Bound Software Listings
1. Program Overview
  - 2.
  3. Listing (PLC code from Vol. V.1)
    - 3.1 OB listing (O blocks)
    - 3.2 PB listing
    - 3.3 FB listing (Function blocks)
    - 3.4 FW listing
    - 3.9 DB Listing
  4. Reference Tables (spiral bound at top)
10. Volume V.2 Software Documentation - LCU Software Sept. 97
11. Volume V.3 Software Documentation - OCU Software Sept. 97

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## **Documentation for Siemens Crates, CPUs, Modules, and Software**

### **Siemens 1 (large softbound)**

Siemens Simatic S5/PC/505 Automation Systems Catalog ST50 - 1998

### **Siemens 2 (large softbound)**

Siemens Simatic S5-135U/S155U System Manual

### **Siemens 3 (large 3-ring binder)**

Siemens Simatic S5/135U CPU 928B (Versions 3UB11 & 3UB12) Programming Guide  
(Vertex delivered system with 928B-3UB11)

### **Siemens 4 (large softbound)**

Siemens Simatic S5/135U CPU 928B (Version 3UB21) Programming Guide  
The spare CPU we purchased is a 928B-3UB21)

### **Siemens 5 (large 3-ring binder)**

Siemens Simatic S5-135U/155U CPU928B/CPU948 Communication

### **Siemens 6 (small 3-ring binder)**

Siemens Simatic S5 CP581 Volume 1/2: Hardware

### **Siemens 7 (small 3-ring binder)**

Siemens Simatic S5 CP581 Volume 2/2: Software

### **Siemens 8 (small softbound)**

Siemens Simatic S5 COM 525 Programming Package for CP524 and CP 525 (S5 -DOS)  
Vol 1/2

### **Siemens 9 (small softbound)**

Siemens Simatic S5 COM 525 Programming Package for CP524 and CP 525 (S5 -DOS)  
Vol 2/2

### **Siemens 10 (small softbound)**

Siemens Simatic S5 Step 5 Version 6.6 (Step 5 software reference/development manual)  
(PC software development installation guide is at the back of Vertex Vol IV.1)

### **Siemens 11 (even smaller softbound)**

Simatic S5 Working with S5-DOS/ST

**Siemens 11a** (small 2-hole binder with plastic cover)  
Simatic S5 Extern Prommer (manual for the external programmer for SIMATIC submodules and memory Cards). This book is kept in a box with the prommer, power supply, connecting cable, and installation disk.

**Siemens 12** (large, fat 3-ring binder)  
Simatic S5 Programming I Training Manual

**Siemens 13** (large, fat 3-ring binder)  
Simatic S5 Programming II Training Manual

**Siemens 14** ( spiral bound: green cover, green spiral)  
Simatic S5-135U PC-CPU928B Programming Guide Condensed

**Siemens 15** ( spiral bound: blue cover, black spiral)  
S5 Programming I Study Guide Learner

**Siemens 16** ( spiral bound: white cover, black spiral)  
S5 Maintenance Course I - Application Workbook

**Siemens 17** ( spiral bound: white cover, black spiral)  
S5 Maintenance Course II - Application Workbook

**Siemens 18** ( spiral bound: white cover, black spiral)  
S5 Maintenance Course Tutor 1 Guide Drill 4 Guide Quick Guide