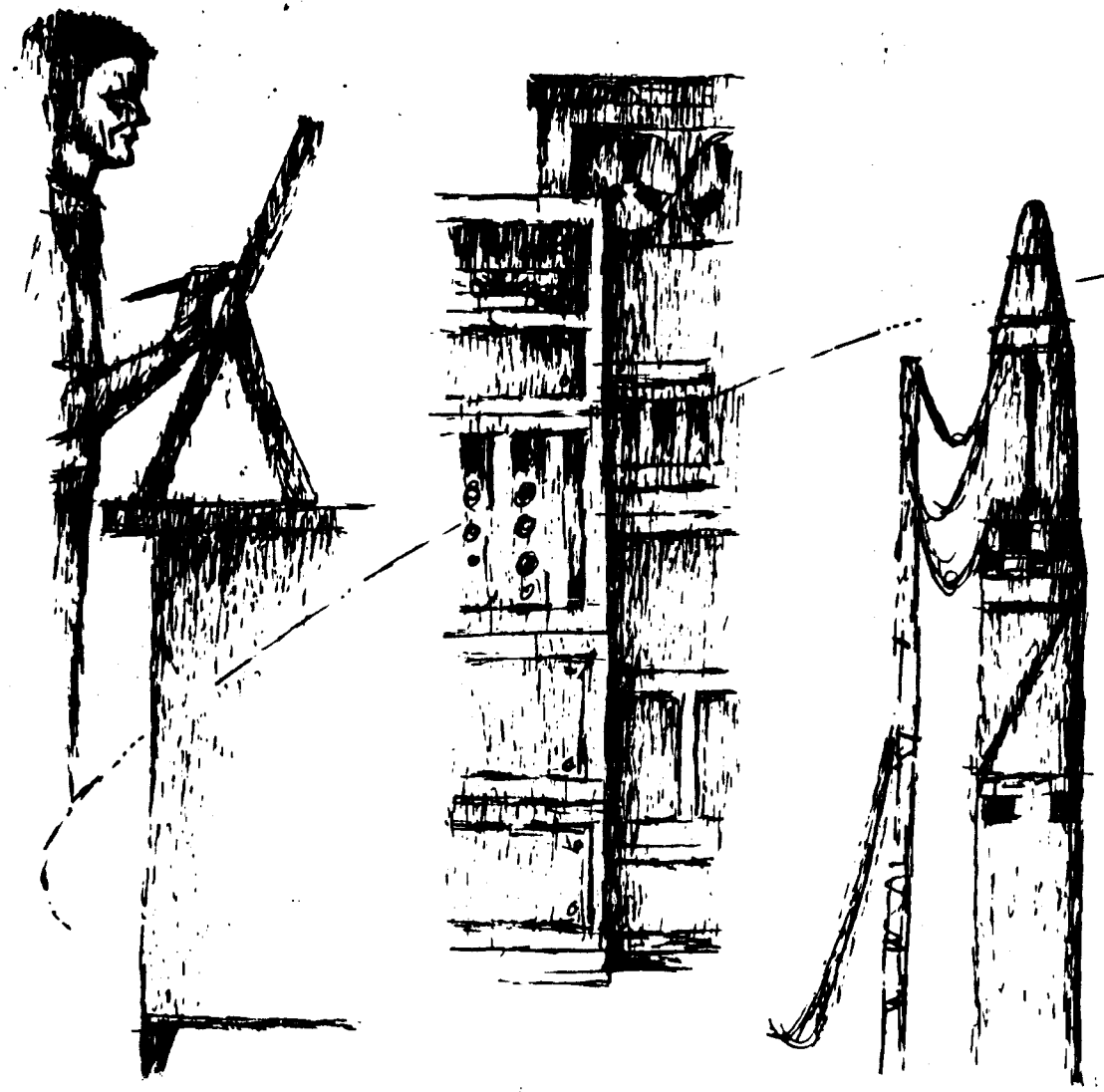


CORONA/J-3 DESIGN REVIEW

PAGES E-1 thru E-50

(ELECTRICAL)

DECEMBER 1966

ELECTRICAL DESIGN

TABLE OF CONTENTS

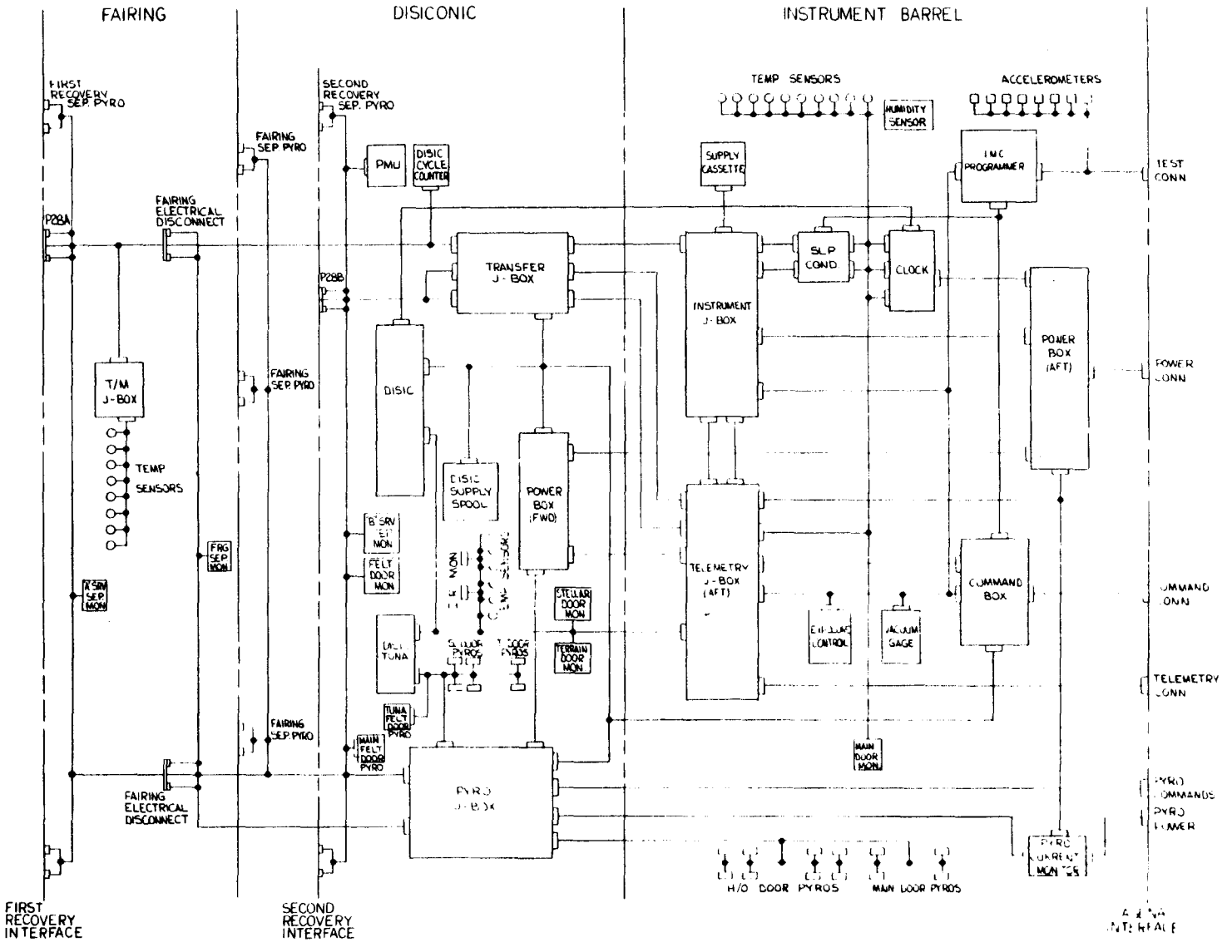
	PAGE
J-3 SYSTEM	
INTERCONNECTION DIAGRAM	E-4
J-3 ELECTRICAL IMPROVEMENTS	E-5
EQUIPMENT INSTALLATION PROFILE	E-6
INSTRUMENT BARREL/AGENA INTERFACE PHOTOGRAPH	E-7
DISIC CONIC/INST. BRL. INTERFACE PHOTOGRAPH	E-8
FAIRING/DISIC CONIC INTERFACE PHOTOGRAPH	E-9
COMMAND SYSTEM	
CR PAN CAMERA CONTROL BLOCK DIAGRAM	E-10
CR PAN CAMERA CONTROL	E-11
CR PAN CAMERA CONTROL SIMPLIFIED SCHEMATIC	E-12
CR PAN CAMERA CONTROL COMMAND DESCRIPTION	E-13
DISIC CONTROL BLOCK DIAGRAM	E-14
DISIC CONTROL	E-15
DISIC CONTROL SIMPLIFIED SCHEMATIC	E-16
DISIC CONTROL COMMAND SYSTEM	E-17
A TO B TRANSFER BLOCK DIAGRAM	E-18
A TO B TRANSFER	E-19
A TO B TRANSFER SIMPLIFIED SCHEMATIC	E-20
A TO B TRANSFER COMMAND DESCRIPTION	E-21
EXPOSURE CONTROL	
EXPOSURE CONTROL PROGRAMMER BLOCK DIAGRAM	E-22
EXPOSURE CONTROL	E-23
EXPOSURE CONTROL SIMPLIFIED SCHEMATIC	E-24
EXPOSURE CONTROL COMMAND DESCRIPTION	E-25
EXPOSURE CONTROL TIMING DIAGRAM	E-26
EXPOSURE CONTROL	E-27

ELECTRICAL DESIGN

CONTENTS (CONT'D)

	PAGE
• IMAGE MOTION COMPENSATION (IMC) PROGRAMMER	
IMC PROGRAMMER BLOCK DIAGRAM	E-28
IMC PROGRAMMER	E-29
IMC PROGRAMMER SIMPLIFIED SCHEMATIC	E-30
IMC PROGRAMMER COMMAND DESCRIPTION	E-31
• SILICONE LIGHT PULSER (SLP) SYSTEM	
SLP CONDITIONER BLOCK DIAGRAM	E-32
SLP CONDITIONER	E-33
SLP SIMPLIFIED LOGIC DIAGRAM	E-34
	E-35
• PYRO SYSTEM	
PYRO ACTUATED DEVICES	E-36
PYRO SYSTEM	E-37
PYRO EVENTS & COMMAND DESCRIPTION	E-38 & E-39
• POWER SYSTEM	
POWER ESTIMATE	E-40
POWER DISTRIBUTION PLAN	E-41
• T/M SYSTEM	
T/M SYSTEM BLOCK DIAGRAM	E-42
T/M SYSTEM	E-43
T/M INSTRUMENTATION LIST	E-44 & E-45
TAPE RECORDER BLOCK DIAGRAM	E-46
TAPE RECORDER SYSTEM	E-47
• ENGINEERING ANALYSIS	E-48
• BIBLIOGRAPHY	E-49
	E-50

ELECTRICAL DESIGN

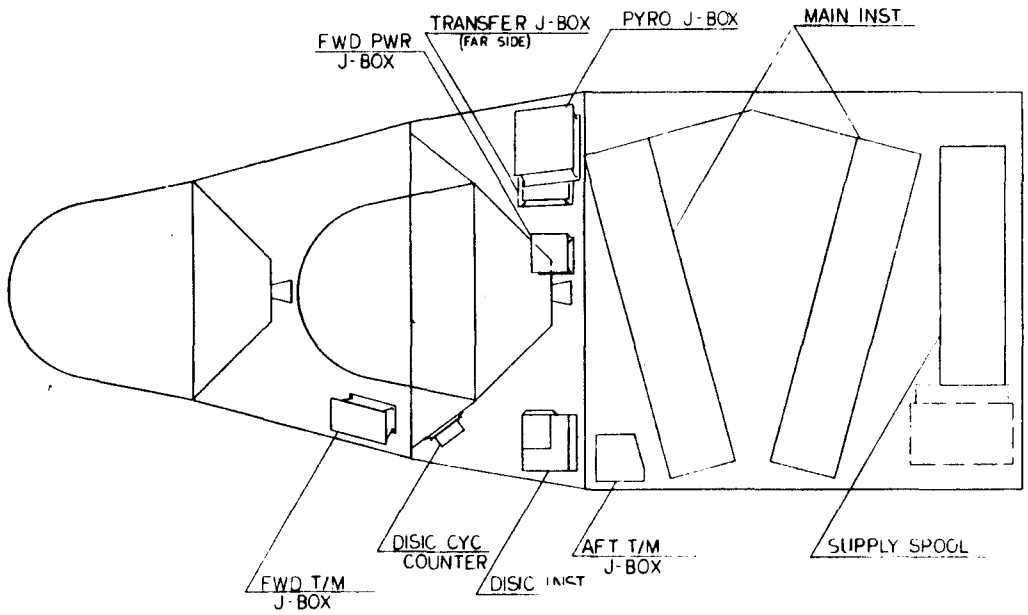


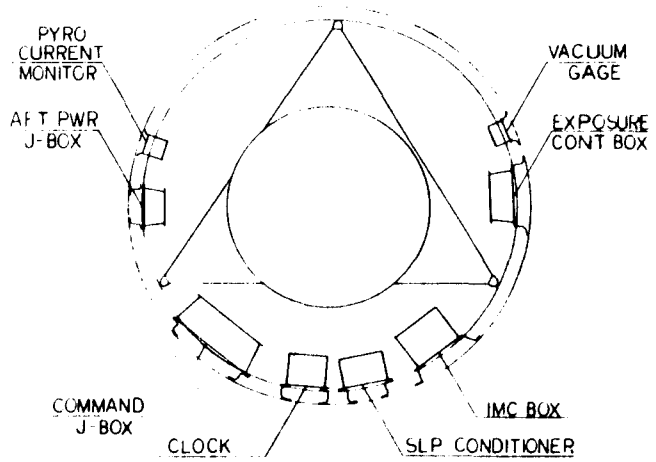
INTERCONNECTION DIAGRAM

ELECTRICAL DESIGN

J-3 ELECTRICAL IMPROVEMENTS

- COMMAND SYSTEM
  - MORE CAPABILITY FOR BYPASSING VARIOUS PORTIONS OF CAMERA OPERATE CIRCUITS.
  - ALL CAMERA OPERATE PROGRAMS ARE AVAILABLE FOR EMERGENCY OPERATE MODE.
  - FEWER SERIES ELEMENTS IN PRIMARY COMMAND AND CONTROL LINES INCREASES RELIABILITY.
  - EXPOSURE CONTROL FOR CR PAN CAMERA AND DISIC PROVIDED.
  - RUGGEDIZED STEPPER SWITCHES ELIMINATE NEED FOR REMOVAL OF POWER TO SWITCHES DURING ASCENT.
  - REDUNDANT CIRCUITS PROVIDED FOR A TO B TRANSFER CONTROL CIRCUITS.
- IMC SYSTEM
  - EXPANDED SELECTION OF AVAILABLE CURVES TO MATCH ORBIT.
  - EARTH OBLATENESS CORRECTION FACTOR ADDED TO ORBIT ECCENTRICITY FUNCTION.
  - HAS SLEW TO HOME CAPABILITY IF START DELAY TIME PLUS FUNCTION PERIOD EXCEEDS ORBIT PERIOD.
- T/M SYSTEM
  - INCREASED BITS OF INFORMATION BY ADDING MORE COMMUTATED CHANNELS.
- PYRO SYSTEM
  - SEPARATE PYRO VOLTAGE BUSS IS PROVIDED.
  - EACH PYRO DEVICE IS ACTIVATED BY INDEPENDENT CIRCUITS FROM COMMAND TO SQUIB EXCITATION.
  - FUSISTOR LOCATED BETWEEN PYRO POWER SOURCE & RELAY CONTACTS PROTECTS BUSS FROM POSSIBLE PLASMA ARCING IN RELAYS.
- ADDED RECOVERABLE TAPE RECORDER.

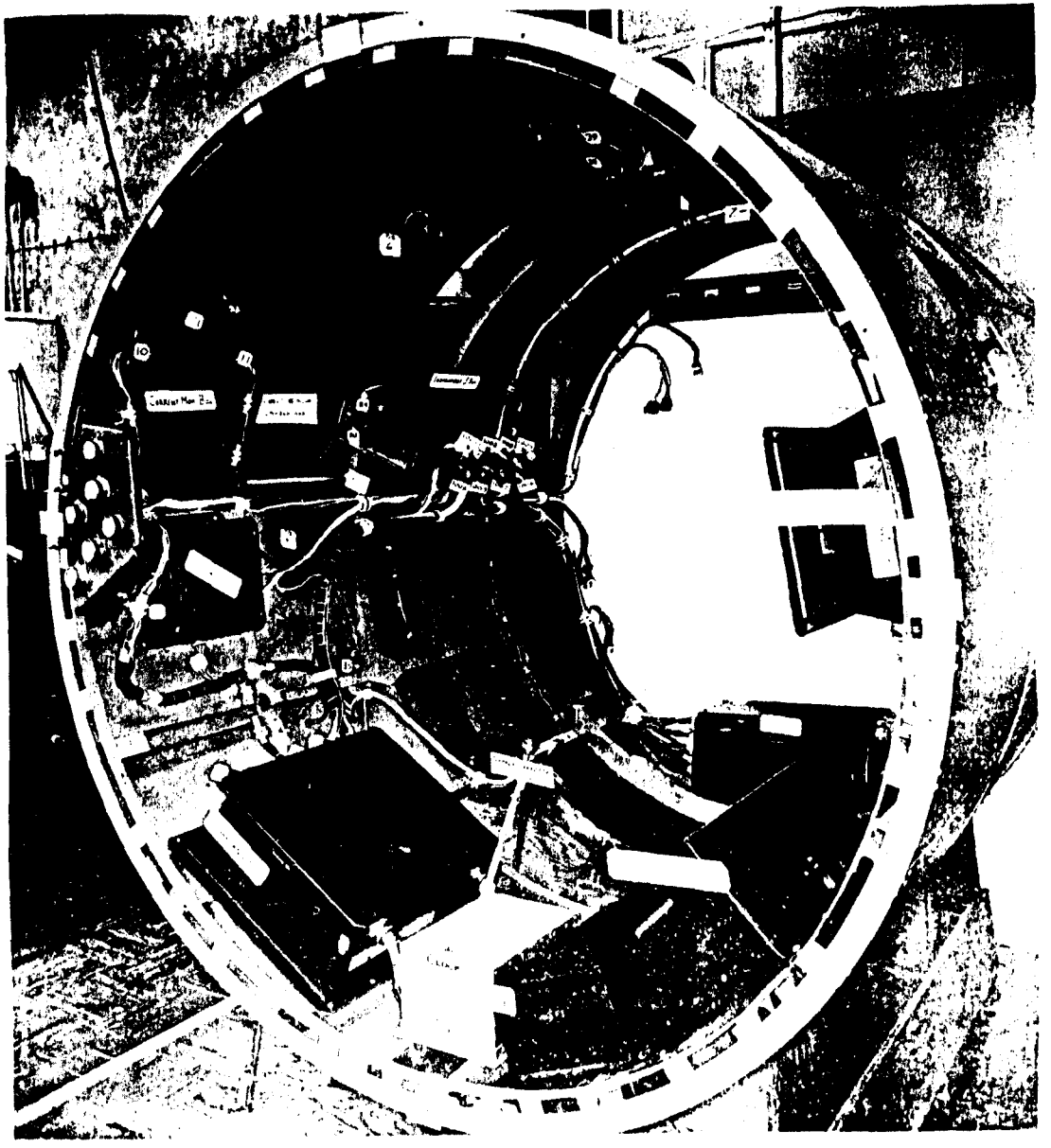




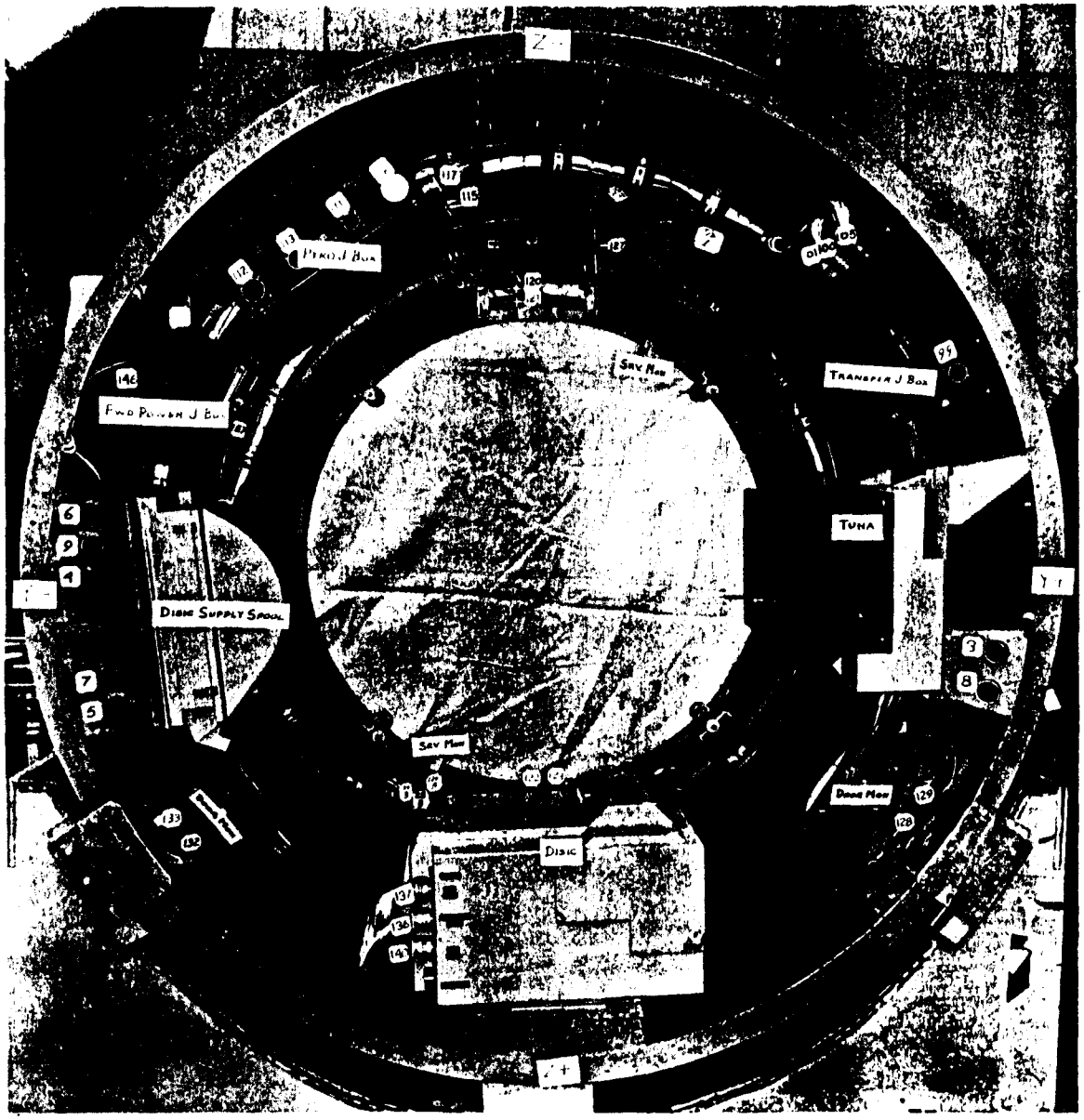
EQUIPMENT INSTALLATION

PROFILE

ELECTRICAL DESIGN

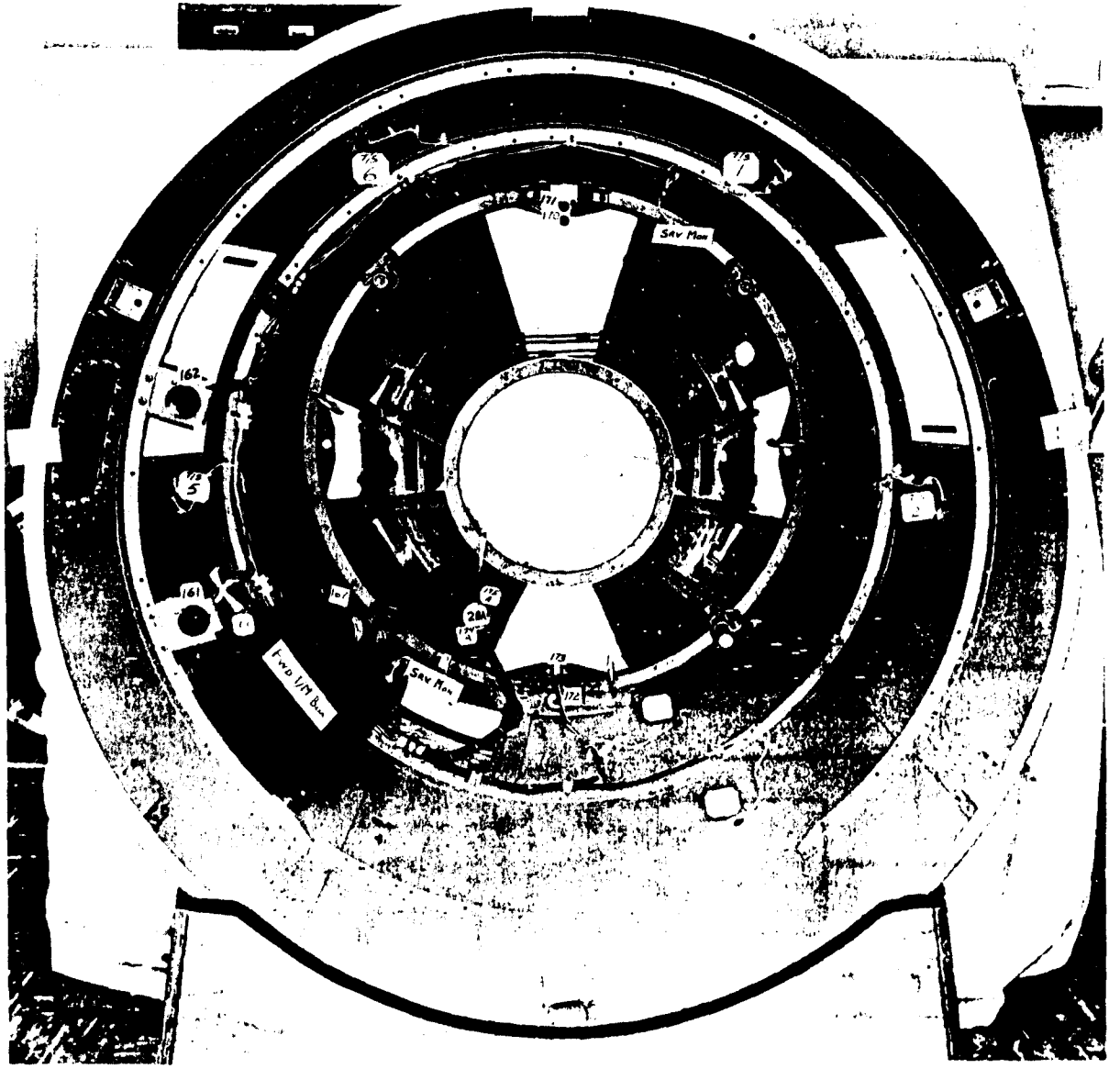


INSTRUMENT BARREL AGENA INTERFACE
(VIEW LOOKING FORWARD INTO [illegible] BARREL SECTION)



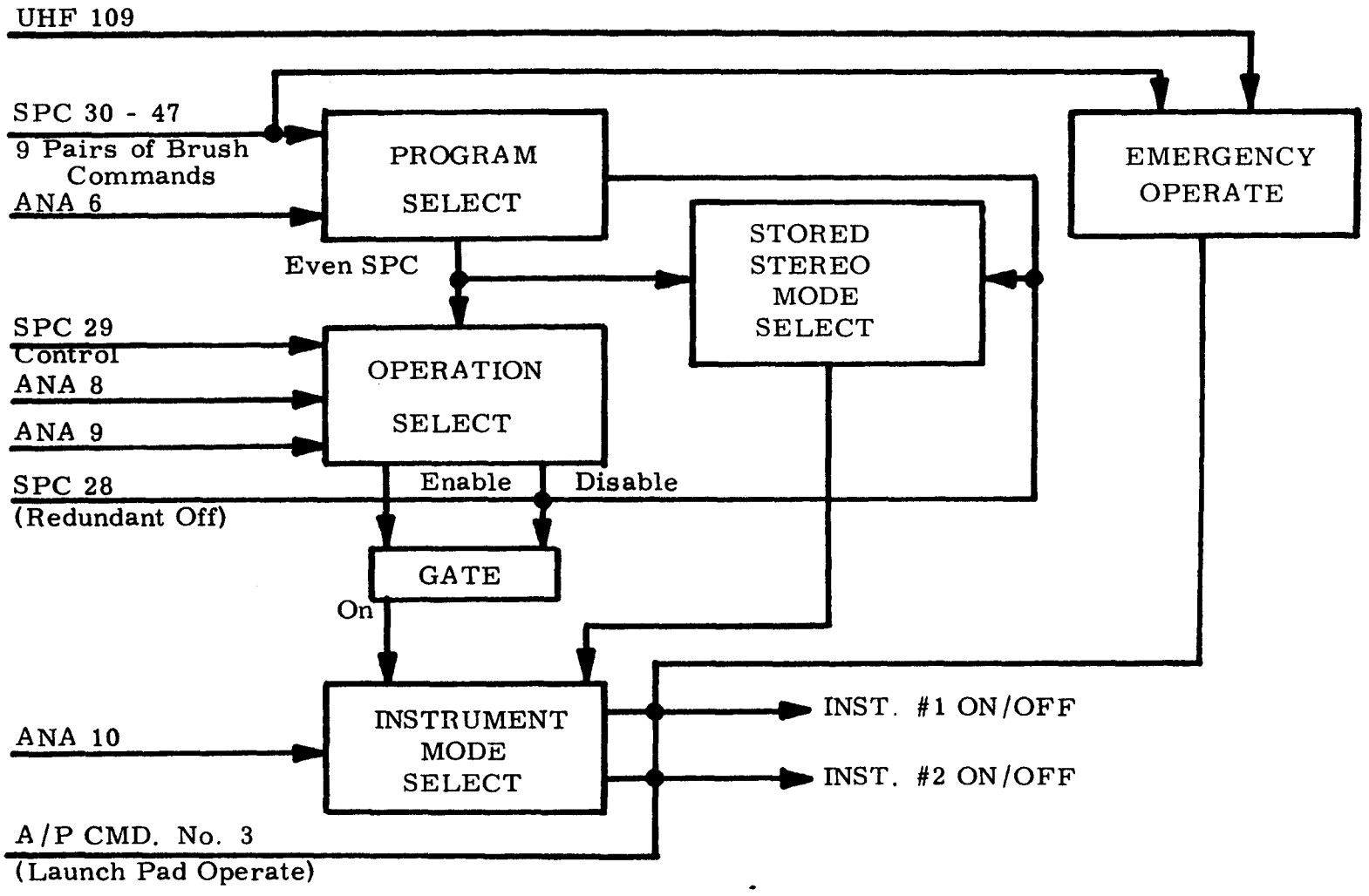
DISIC CONIC/INSTRUMENT BARREL INTERFACE
(VIEW LOOKING FORWARD INTO DISIC CONIC MOCK-UP)

ELECTRICAL DESIGN



FAIRING/DISIC CONIC INTERFACE
(VIEW LOOKING FORWARD INTO FAIRING MOCK-UP)

ELECTRICAL DESIGN

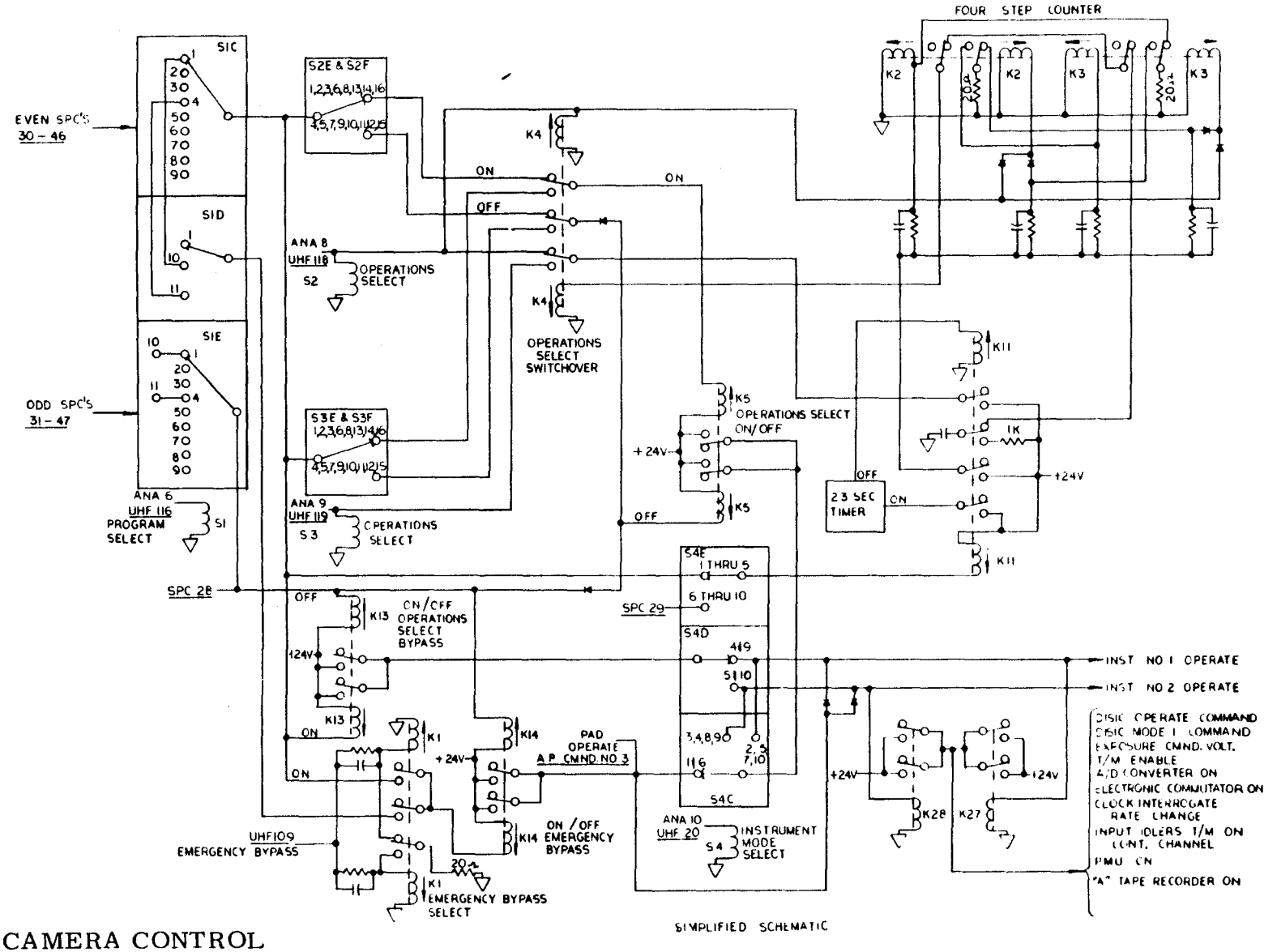


CR PAN CAMERA CONTROL BLOCK DIAGRAM

ELECTRICAL DESIGN

CR PAN CAMERA CONTROL

- UTILIZES TWO STEPPER SWITCHES FOR OPERATION SELECT CAPABILITY.
- OPERATION SELECT ALLOWS IN-FLIGHT EDITING OF SELECTED INSTRUMENT STORED PROGRAM COMMANDS.
- PROVIDES SELECTION OF 256 DIFFERENT COMBINATION SEQUENCES OF EIGHT SPC ENABLES OR DISABLES.
- NINE INSTRUMENT OPERATE PROGRAMS AVAILABLE.
- RTC CAPABILITY TO BYPASS PROGRAM SELECTOR, OPERATIONS SELECTOR, & INSTRUMENT MODE SELECTOR.



CR PAN CAMERA CONTROL

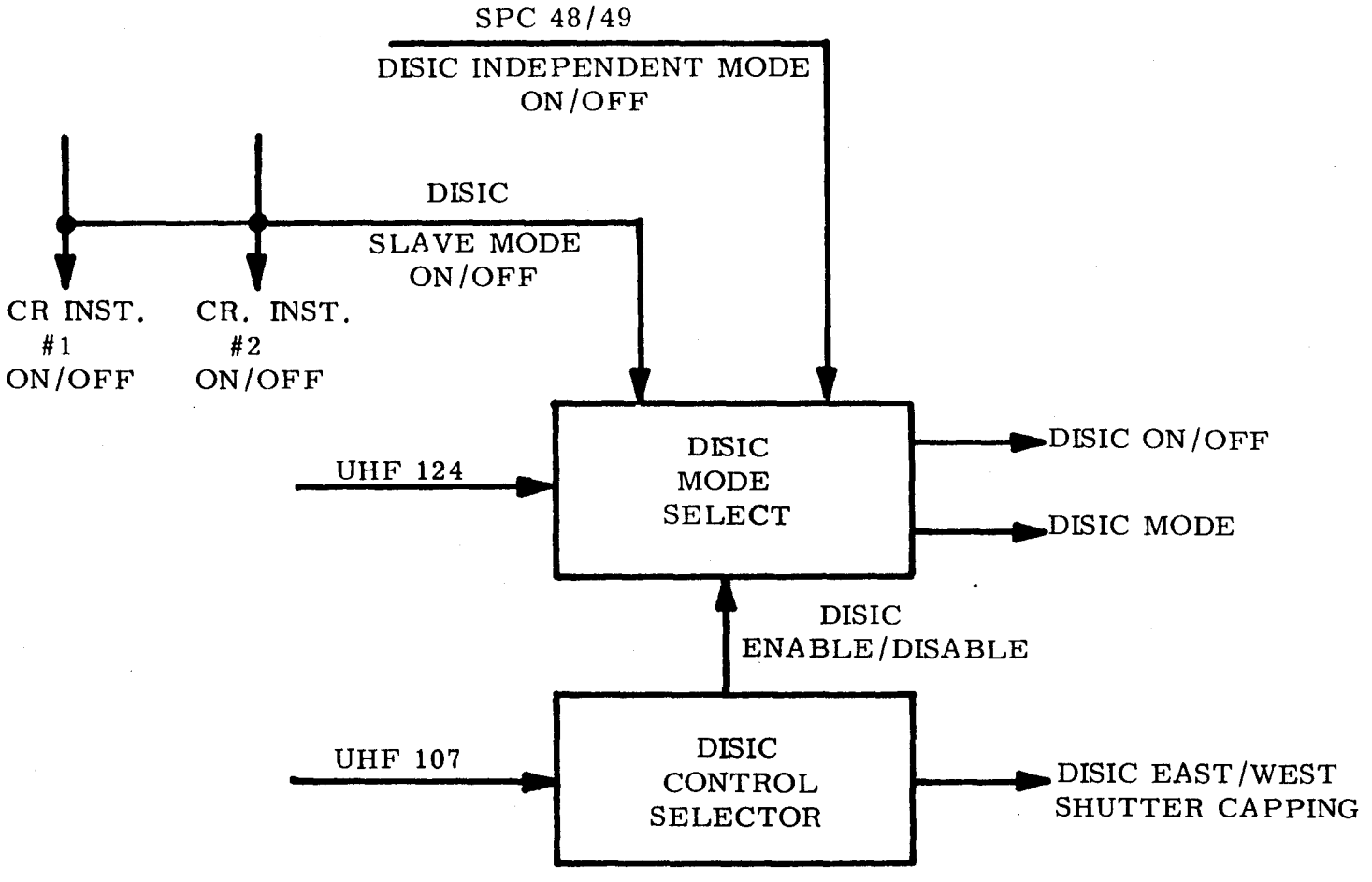
SIMPLIFIED SCHEMATIC

ELECTRICAL DESIGN

CR PAN CAMERA CONTROL COMMAND DESCRIPTION

- ANA-6/UHF-116 SELECTS ONE OF NINE AVAILABLE SPC PAIRS FOR CAMERA ON/OFF CONTROL. SUBSEQUENT IN-FLIGHT PROGRAM EDITING ACCOMPLISHED BY ANA-8/UHF-118 AND ANA-9/UHF-119.
- ANA-8/UHF-118 SELECTS ONE OF SIXTEEN AVAILABLE COMBINATIONS OF FOUR SEQUENTIAL STEPS TO PROVIDE ENABLING OR DISABLING OF THE SELECTED "ON" SPC.
- ANA-9/UHF-119 PROVIDES IDENTICAL CAPABILITY AS ANA-8/UHF-118. THIS SEQUENCE IS AUTOMATICALLY STARTED ON THE COMPLETION OF THE FOUR STEPS SELECTED BY ANA-8/UHF-118 THE RESULTING CAPABILITY IS 256 COMBINATIONAL SEQUENCES OF CAMERA ON/OFF COMMANDS.
- ANA-10/UHF-120 SELECTS EITHER, BOTH OR NEITHER INSTRUMENT TO RESPOND TO ON/OFF COMMANDS RESULTING FROM OPERATIONS SELECT. SELECTS SOURCE OF COMMAND WHICH ADVANCES OPERATIONS SELECT LOGIC. THE TWO SOURCES ARE THE SELECTED "ON" SPC OR SPC #29.
- UHF-109 PROVIDES CAPABILITY OF SELECTING EMERGENCY CAMERA OPERATIONS BYPASSING PROGRAM SELECT, OPERATION SELECT & INSTRUMENT MODE SELECT. IT IS ALSO USED AS A BACKUP RESET FOR TIMERS IN A TO B TRANSFER CIRCUITS.
- SPC 30 THROUGH 47: CAMERA PROGRAMS 1 THROUGH 9. EVEN NUMBERED SPC'S ARE ON COMMANDS, ODD NUMBERED SPC'S ARE OFF COMMANDS. EVEN NUMBERED SPC'S MAY BE CONVERTED TO AN ACTIVE "OFF" COMMAND BY OPERATIONS SELECT DISABLE LOGIC.
- SPC 28 CAMERA PROGRAMS REDUNDANT OFF COMMAND. ALL OF THE VARIOUS CAMERA OPERATE CONTROL CIRCUITS WILL RESPOND TO AN SPC 28.
- SPC 29 WHEN SELECTED BY ANA-10/UHF-120 ADVANCES THE ACTIVE OPERATIONS SELECT LOGIC SEQUENCE ONE STEP. PROVIDES BLOCK EDITING OF CAMERA OPERATE PROGRAMS.
- AP CMD #3 ALLOWS BLOCKHOUSE OPERATION OF CR INSTRUMENTS IN STEREO MODE.

ELECTRICAL DESIGN

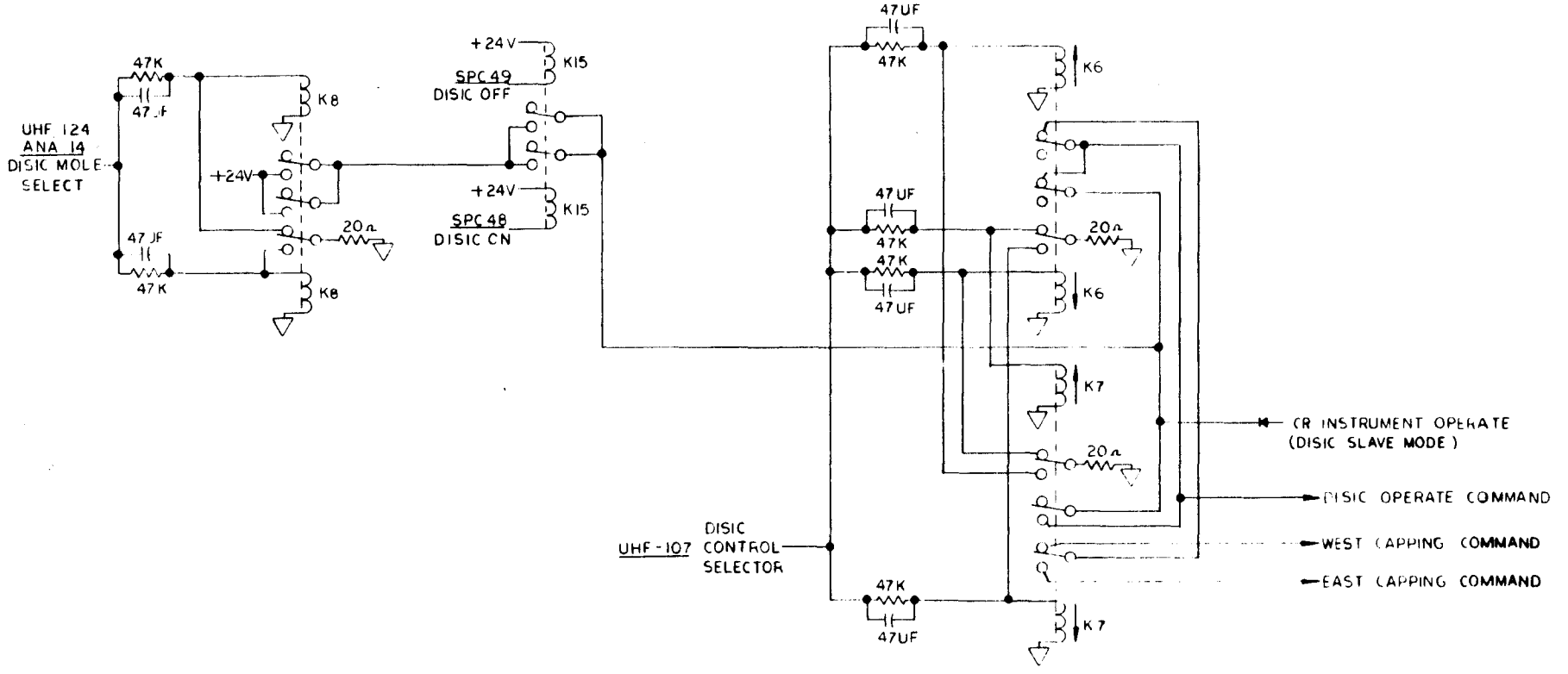


DISIC CONTROL BLOCK DIAGRAM

ELECTRICAL DESIGN

DISIC CONTROL

- HAS INDEPENDENT SPC CONTROL WHICH IS ENABLED BY RTC.
- SLAVE CONTROL MODE OVERRIDES INDEPENDENT CONTROL MODE
- IN SLAVE CONTROL MODE THREE PAIR OF STELLAR EXPOSURES AR E MADE TO ONE TERRAIN EXPOSURE.
- IN INDEPENDENT CONTROL MODE, ONE PAIR OF STELLAR EXPOSUR ES ARE MADE TO ONE TERRAIN EXPOSURE.
- RTC CONTROL IS USED TO INHIBIT UNCAPPING OF EITHER STELLAR SHUTTER
- RTC CONTROL ALSO PROVIDES COMPLETE SYSTEM DISABLING.



K6↓ K7↓ DISIC OPERATE/WEST CAPPED
K6↓ K7↑ DISIC OPERATE/EAST CAPPED
K6↑ K7↑ DISIC OPERATE NONE CAPPED
K6↑ K7↓ DISIC DISABLE

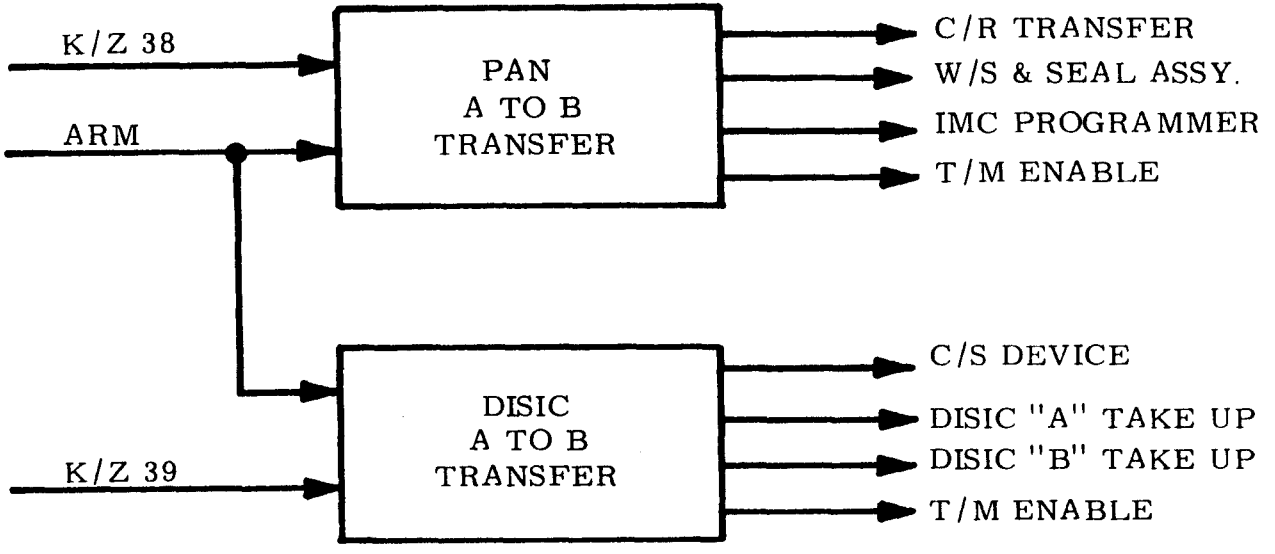
DISIC CONTROL

DISIC CONTROL COMMAND DESCRIPTION

- ANA-14/UHF-124 ALTERNATELY DISABLES OR ENABLES SPC-48 & SPC-49 FOR USE AS AN INDEPENDENT DISIC OPERATE PROGRAM.

- UHF-107 PROVIDES INHIBITING CONTROL OF EITHER STELLAR UNCAPPING CIRCUITRY. IT IS ALSO USED TO DISABLE ANY OPERATE COMMAND FROM BEING SENT TO THE DISIC.

ELECTRICAL DESIGN



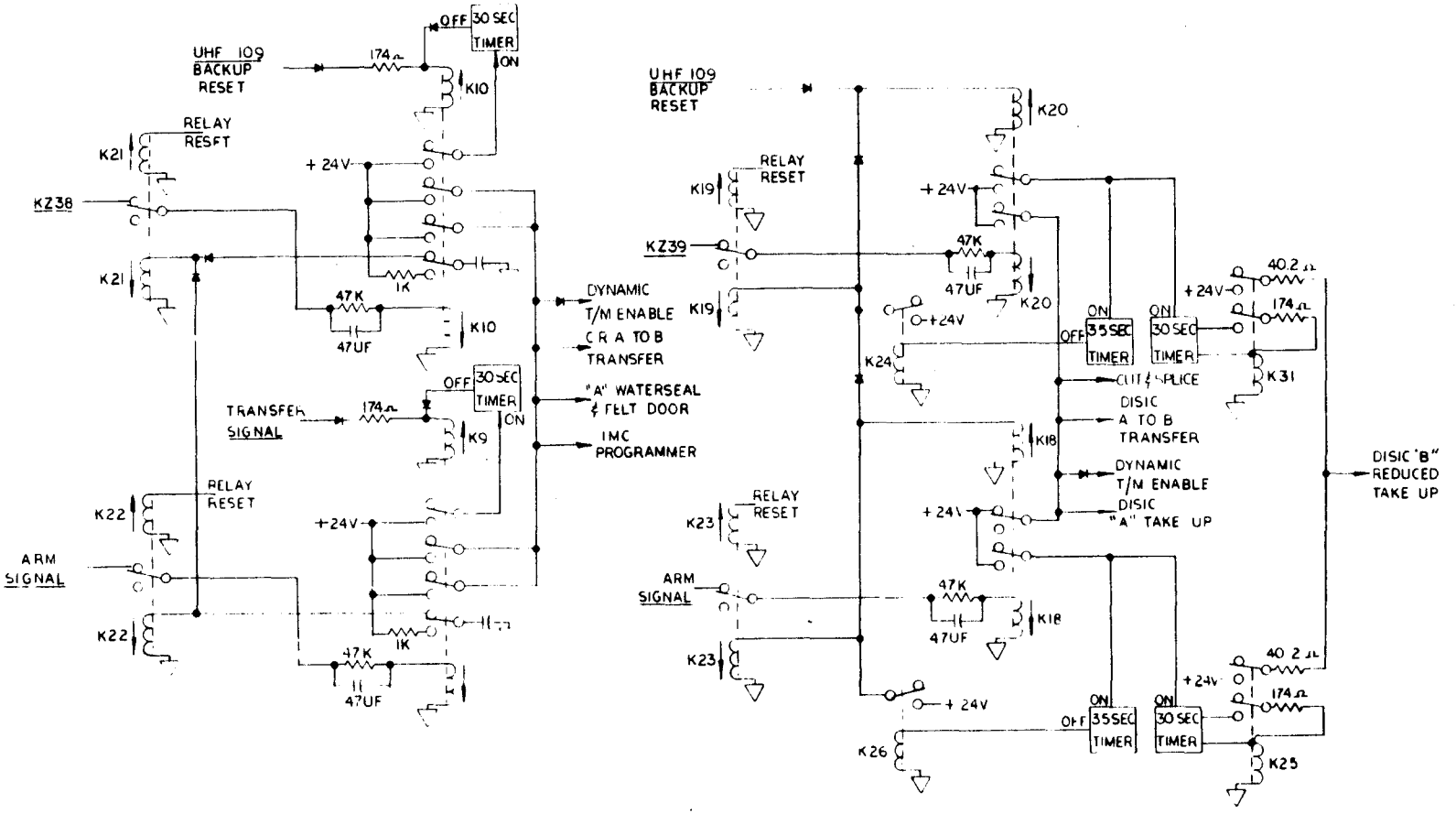
A TO B TRANSFER BLOCK DIAGRAM

ELECTRICAL DESIGN

A TO B TRANSFER

- INDEPENDENT EXECUTION OF DISIC OR CR "A" TO "B" TRANSFER SEQUENCES BY SECURE RTC'S.

- BOTH SEQUENCES BACKED-UP BY REDUNDANT CIRCUIT EXECUTED BY "A" RECOVERY COMMANDS.



A TO B TRANSFER

ELECTRICAL DESIGN

A TO B TRANSFER COMMAND DESCRIPTION

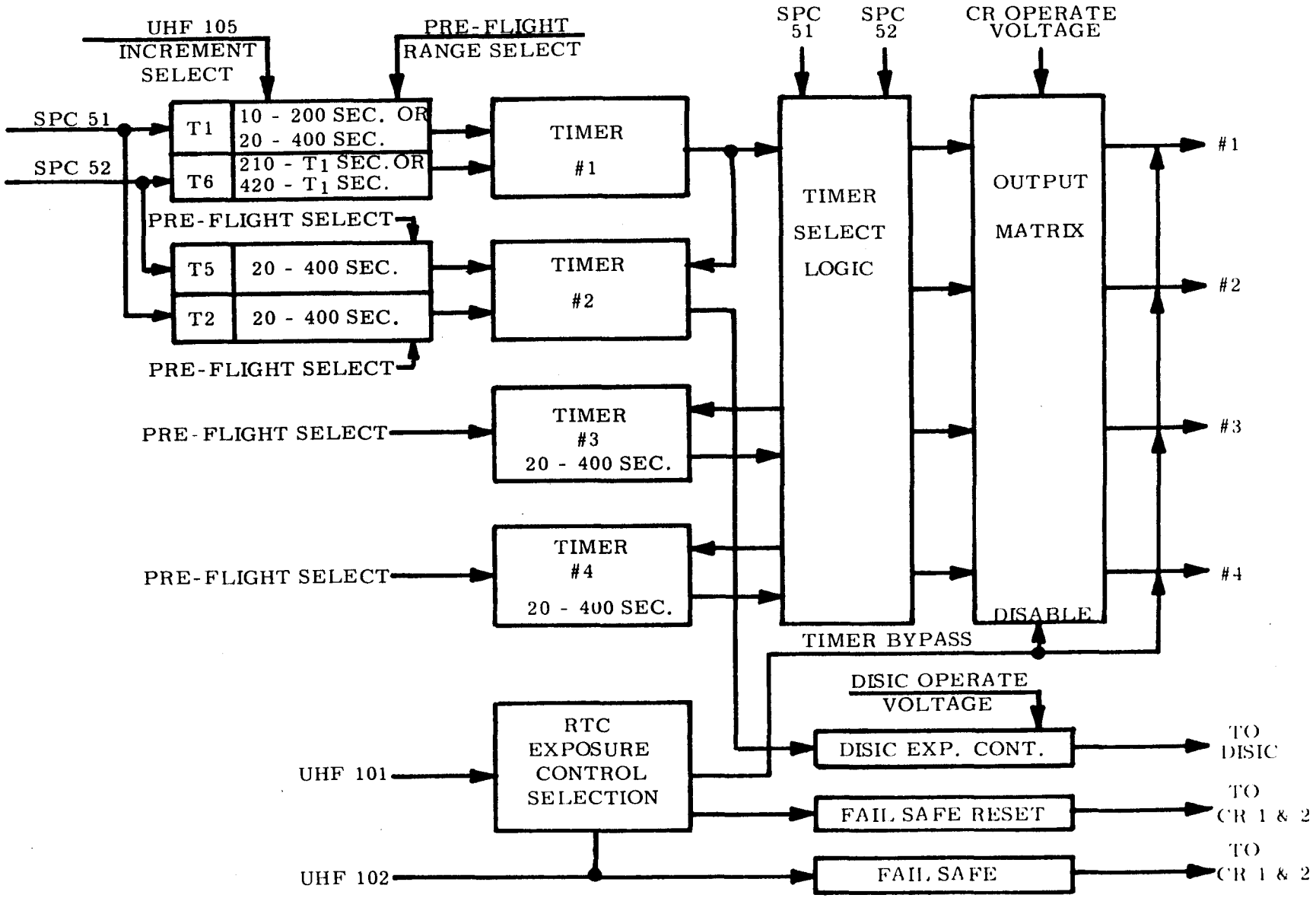
- KZ-38 INITIATES A SEQUENCE OF EVENTS RESULTING IN THE TRANSFER OF THE CR INSTRUMENT'S FILM TAKE-UP CONTROL & INSTRUMENTATION FROM THE "A" SRV TO THE "B" SRV.

- KZ-39 INITIATES A SIMILAR SEQUENCE FOR THE DISIC FILM TRANSFER.

- UHF-109: BACKUP RESET FOR TIMERS INITIATED BY KZ-38 & KZ-39.

- "A" RECOVERY ARM SIGNAL INITIATES IDENTICAL SEQUENCES TO THOSE INITIATED BY KZ-38 & KZ-39. IT RESULTS IN SIMULTANEOUS TRANSFER OF CR AND DISIC FILM FROM SRV "A" TO "B" SRV, IF NOT PREVIOUSLY COMPLETED BY KZ-38 OR KZ-39.

- "A" RECOVERY TRANSFER SIGNAL: BACKUP RESET FOR TIMERS INITIATED BY THE ARM SIGNAL.

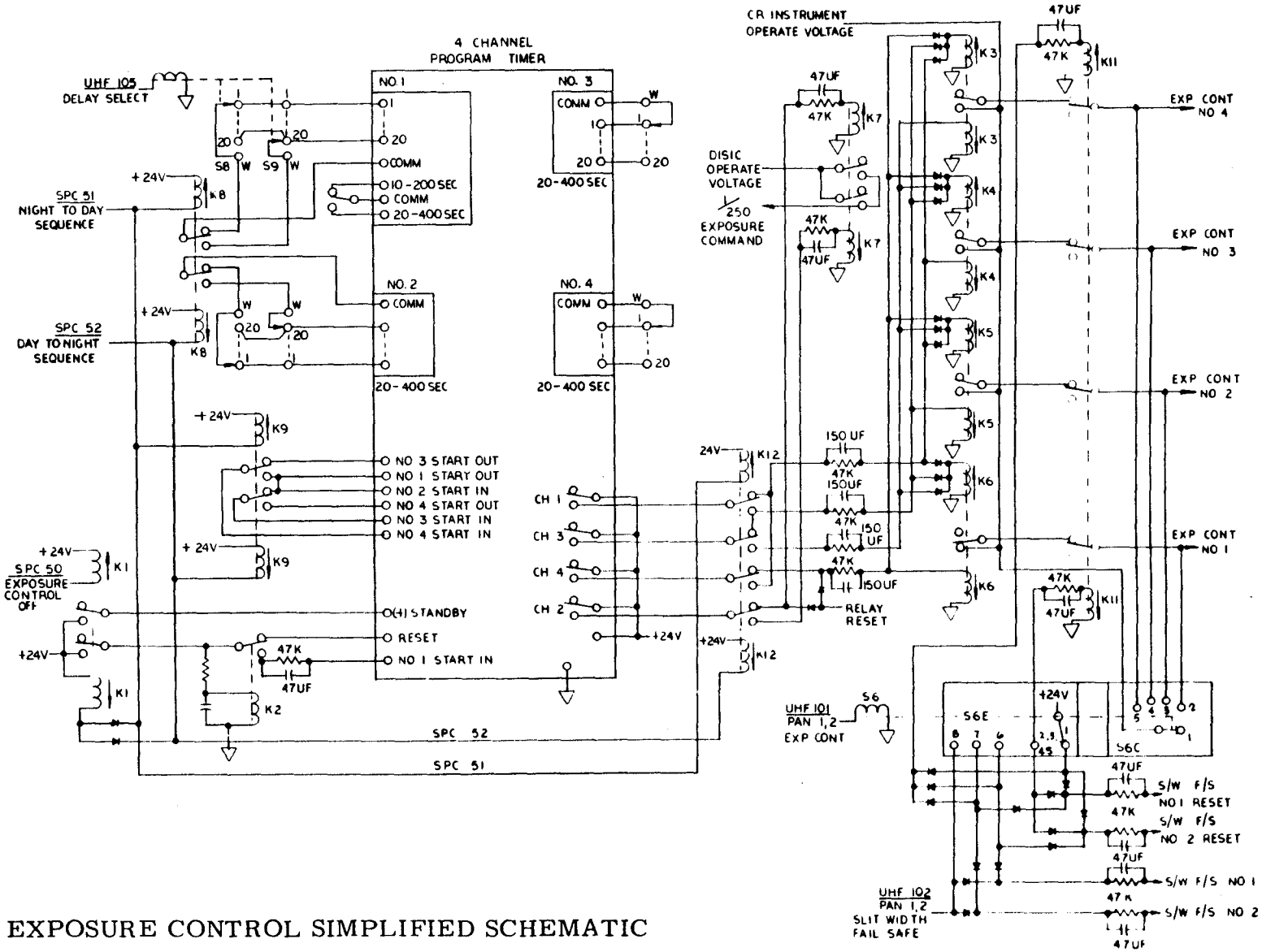


EXPOSURE CONTROL PROGRAMMER BLOCK DIAGRAM

ELECTRICAL DESIGN

EXPOSURE CONTROL

- PROVIDES CONTROL OF FOUR EXPOSURE POSITIONS AND A FAIL SAFE POSITION FOR THE CR INSTRUMENT AND ONE EXPOSURE CHANGE FOR DISIC.
- SEQUENCES THROUGH EXPOSURE CHANGES FROM NIGHT TO DAY & DAY TO NIGHT POSITIONS.
- HAS RTC CONTROL FOR BYPASS OF SEQUENCER AND SELECTION OF ONE OF THE FOUR EXPOSURE POSITIONS FOR THE CR INSTRUMENTS FOR SPECIFIC TARGETING REQUIREMENTS.
- PROVIDES RTC CONTROL OF TIMING SYSTEM TO COMPENSATE FOR LAUNCH WINDOW UNCERTAINTIES AND/OR DELAYS.

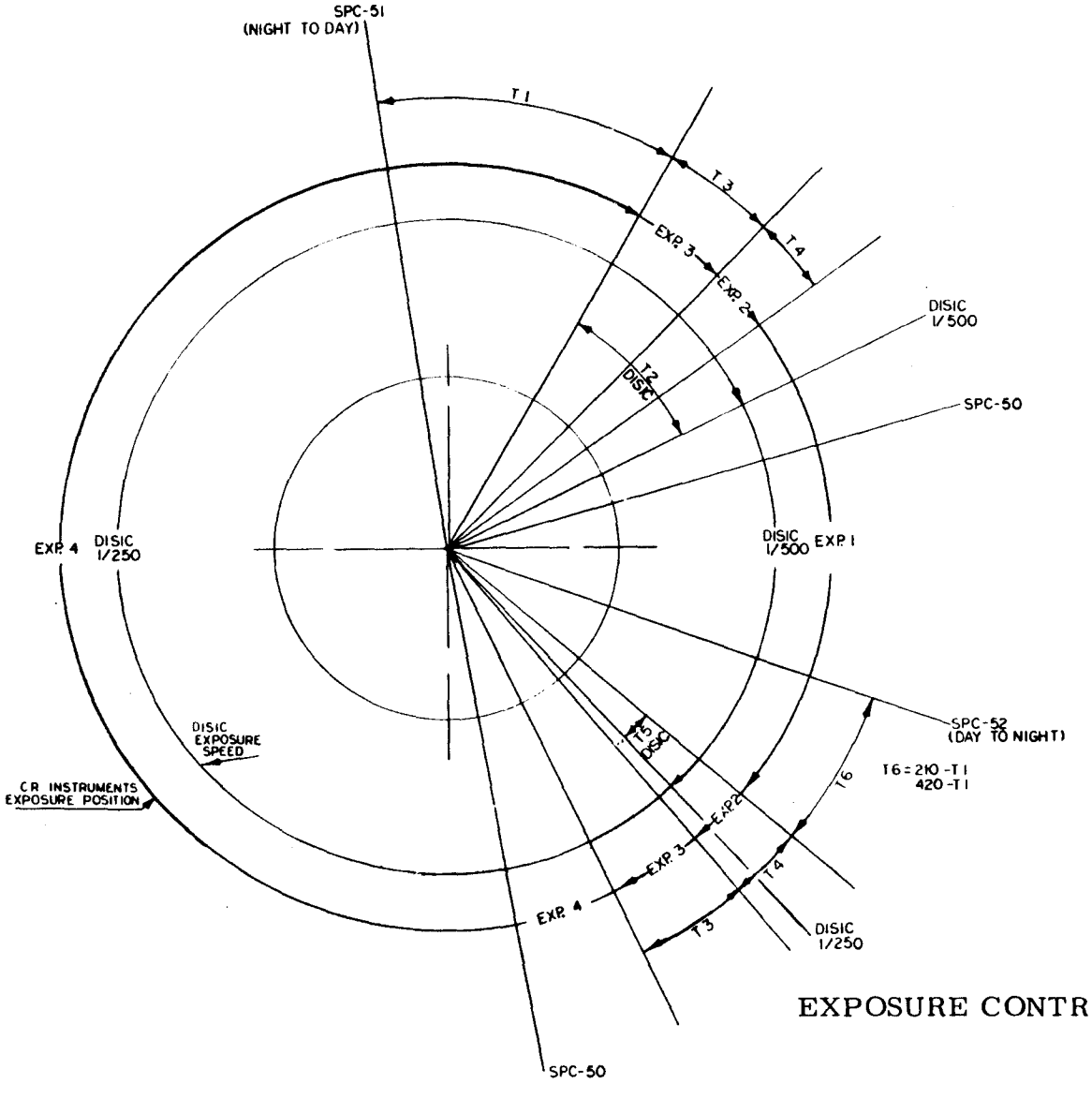


EXPOSURE CONTROL SIMPLIFIED SCHEMATIC

ELECTRICAL DESIGN

EXPOSURE CONTROL COMMAND DESCRIPTION

- UHF-105 SELECTS ONE OF TWENTY AVAILABLE TIME DELAYS TO COMPENSATE FOR LAUNCH WINDOW UNCERTAINTIES AND/OR DELAYS.
- UHF-101 PROVIDES INDIVIDUAL SELECTION OF ANY ONE OF THE FOUR SLIT WIDTHS ON THE CR INSTRUMENTS AND INHIBITS NORMAL SEQUENCING. IT ALSO PROVIDES INDIVIDUAL FAIL SAFE RESET OF EITHER INSTRUMENT'S EXPOSURE CONTROL SYSTEM.
- UHF-102 BACKS UP UHF-101 FOR PLACING BOTH INSTRUMENTS IN THE EXPOSURE FAIL SAFE POSITION.
- SPC-51 INITIATES A NIGHT TO DAY SEQUENCE OF EXPOSURE SETTINGS FOR THE CR INSTRUMENTS AND THE DISIC.
- SPC-52 INITIATES A DAY TO NIGHT SEQUENCE OF EXPOSURE SETTINGS FOR THE CR INSTRUMENTS AND THE DISIC.
- SPC-50 REMOVES POWER FROM TIMERS BETWEEN SEQUENCES.



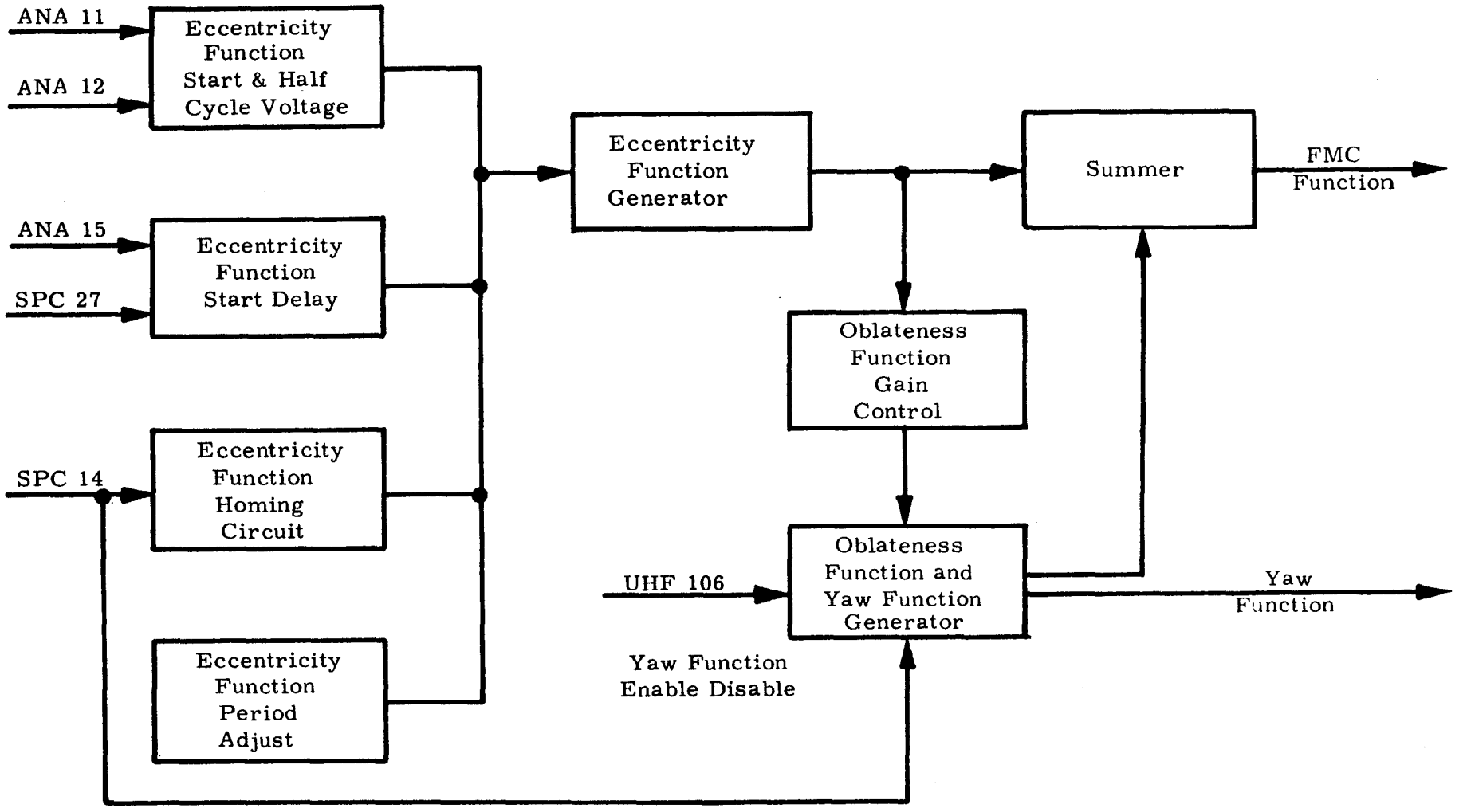
EXPOSURE CONTROL TIMING DIAGRAM

ELECTRICAL DESIGN

EXPOSURE CONTROL

- T_1 SELECTABLE IN-FLIGHT WITH UHF 105
- T_2, T_3, T_4, T_5, T_6 SELECTED PRE-FLIGHT
  - EACH HAS A RANGE OF 20 TO 400 SECONDS IN 20 SECOND INCREMENTS
- EXP. 1 < EXP. 2 < EXP. 3 < EXP. 4

ELECTRICAL DESIGN

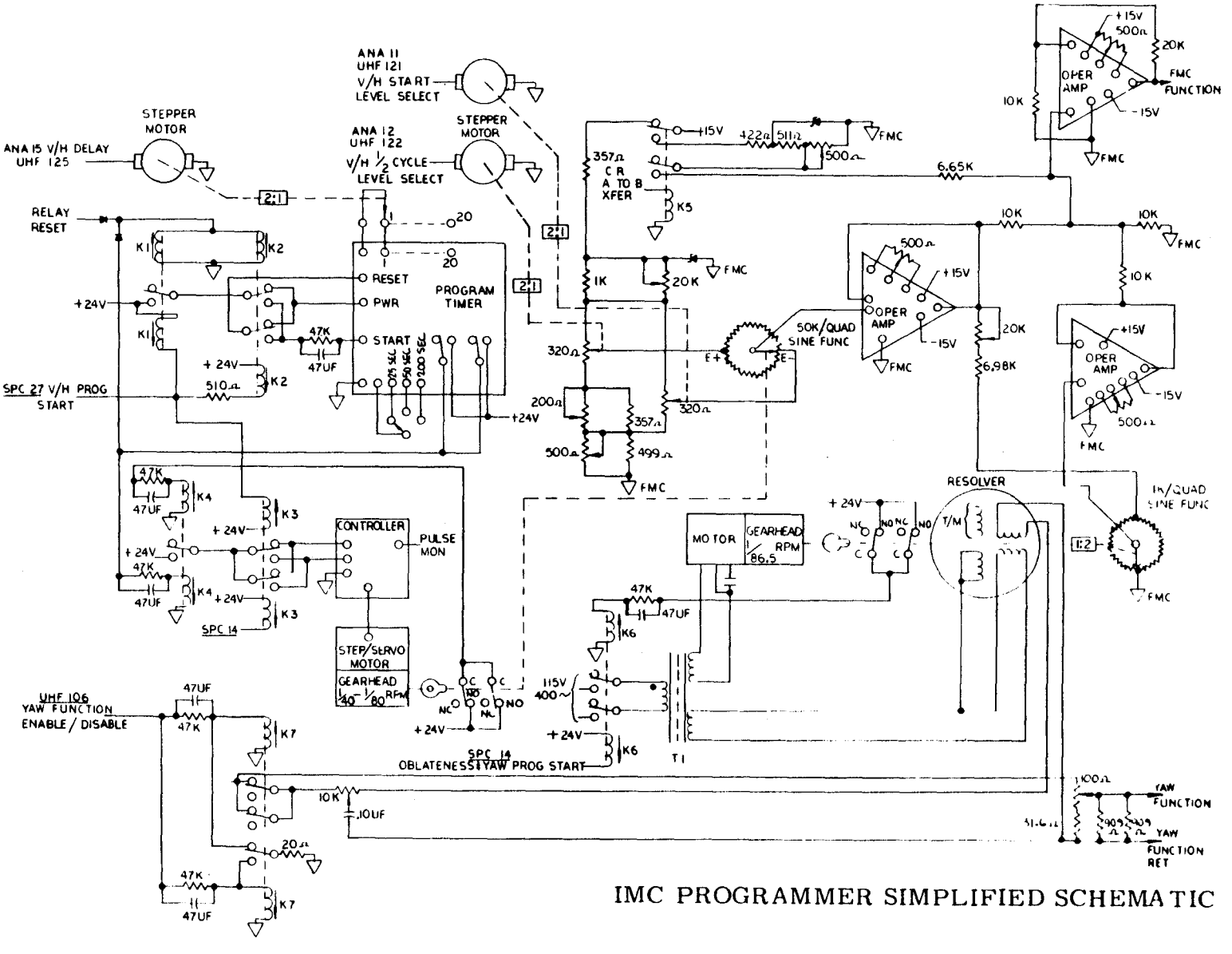


IMC PROGRAMMER BLOCK DIAGRAM

ELECTRICAL DESIGN

IMC PROGRAMMER

- PROVIDES FMC FUNCTION TO CR INSTRUMENTS FOR CONTROL OF CYCLE & NODDING RATES.
- PROVIDES CROSS TRACK MOTION COMPENSATION IN FORM OF YAW ERROR SIGNAL TO AGENA GUIDANCE.
- FMC FUNCTION IS INSTANTANEOUS SUMMATION OF ORBIT ECCENTRICITY & EARTH OBLATENESS PARAMETERS.
- ECCENTRICITY FUNCTION HAS CAPABILITY FOR RTC SELECTION OF:
  - 20 START VOLTAGE LEVELS
  - 20 HALF CYCLE VOLTAGE LEVELS
  - 20 START DELAY TIMES
- OBLATENESS FUNCTION & YAW FUNCTION USE COMMON DRIVE SYSTEM INITIATED BY SPC.



IMC PROGRAMMER SIMPLIFIED SCHEMATIC

ELECTRICAL DESIGN

IMC PROGRAMMER COMMAND DESCRIPTION

- ANA-15/UHF-125 SELECTS ONE OF TWENTY AVAILABLE TIME DELAYS TO COMPENSATE FOR ORBIT UNCERTAINTIES. CONTROLS THE TIME BETWEEN RECEIPT OF A SPC #27 AND START OF THE ECCENTRICITY PORTION OF THE FMC FUNCTION.

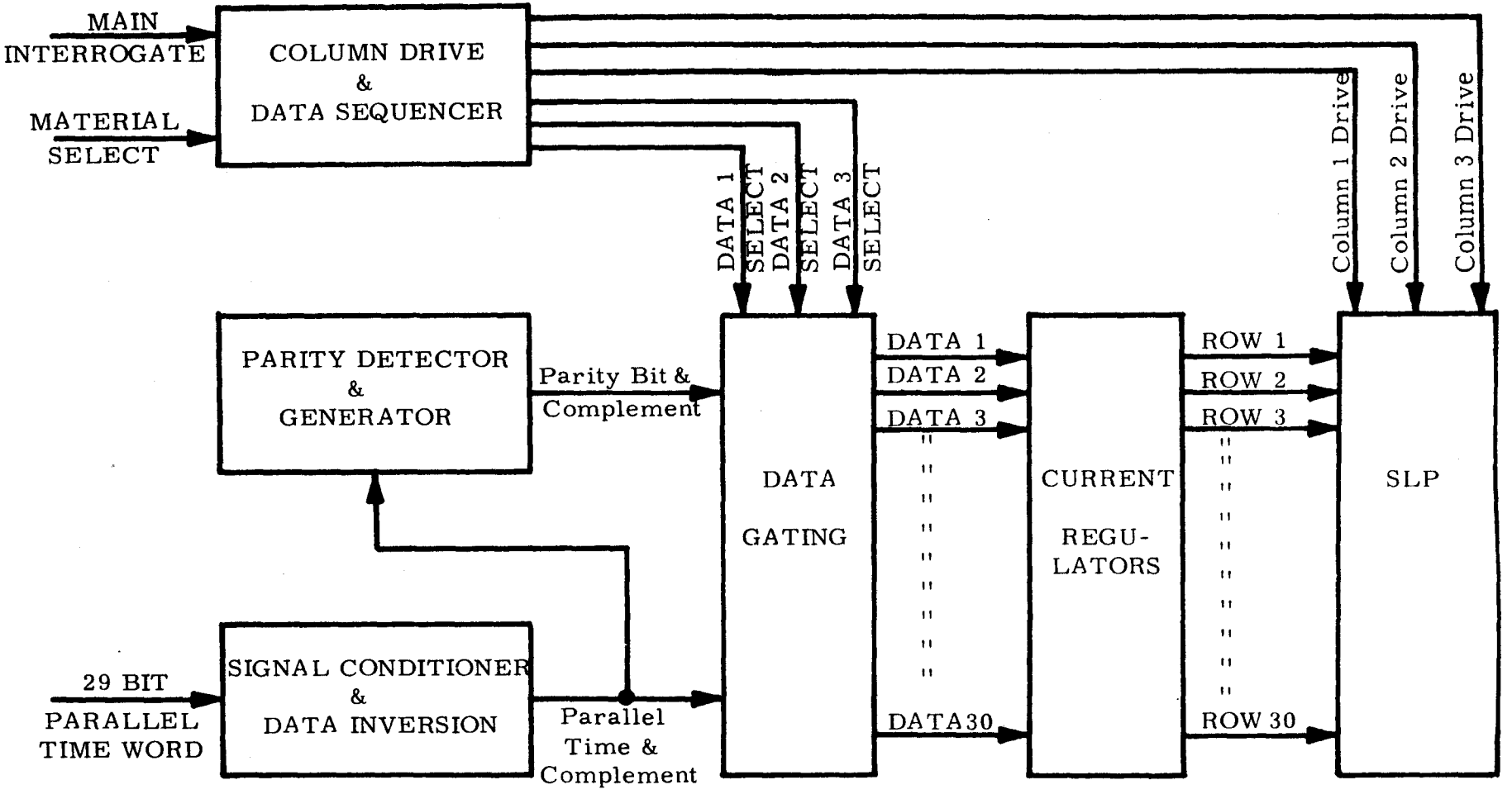
- ANA-11/UHF-121 SELECTS ONE OF TWENTY AVAILABLE FMC FUNCTION START VOLTAGE LEVELS.

- ANA-12/UHF-122 SELECTS ONE OF TWENTY AVAILABLE FMC FUNCTION HALF CYCLE VOLTAGE LEVELS.

- UHF-106 ALTERNATELY ENABLES AND DISABLES OUTPUT OF YAW FUNCTION GENERATOR.

- SPC-27 INITIATES INFLIGHT VARIABLE TIME DELAY SYSTEM WHICH STARTS ECCENTRICITY FUNCTION GENERATOR.

- SPC-14 INITIATES START OF OBLATENESS FUNCTION GENERATOR AND YAW FUNCTION GENERATOR. IT IS ALSO USED TO SLEW THE ECCENTRICITY FUNCTION GENERATOR TO HOME POSITION.

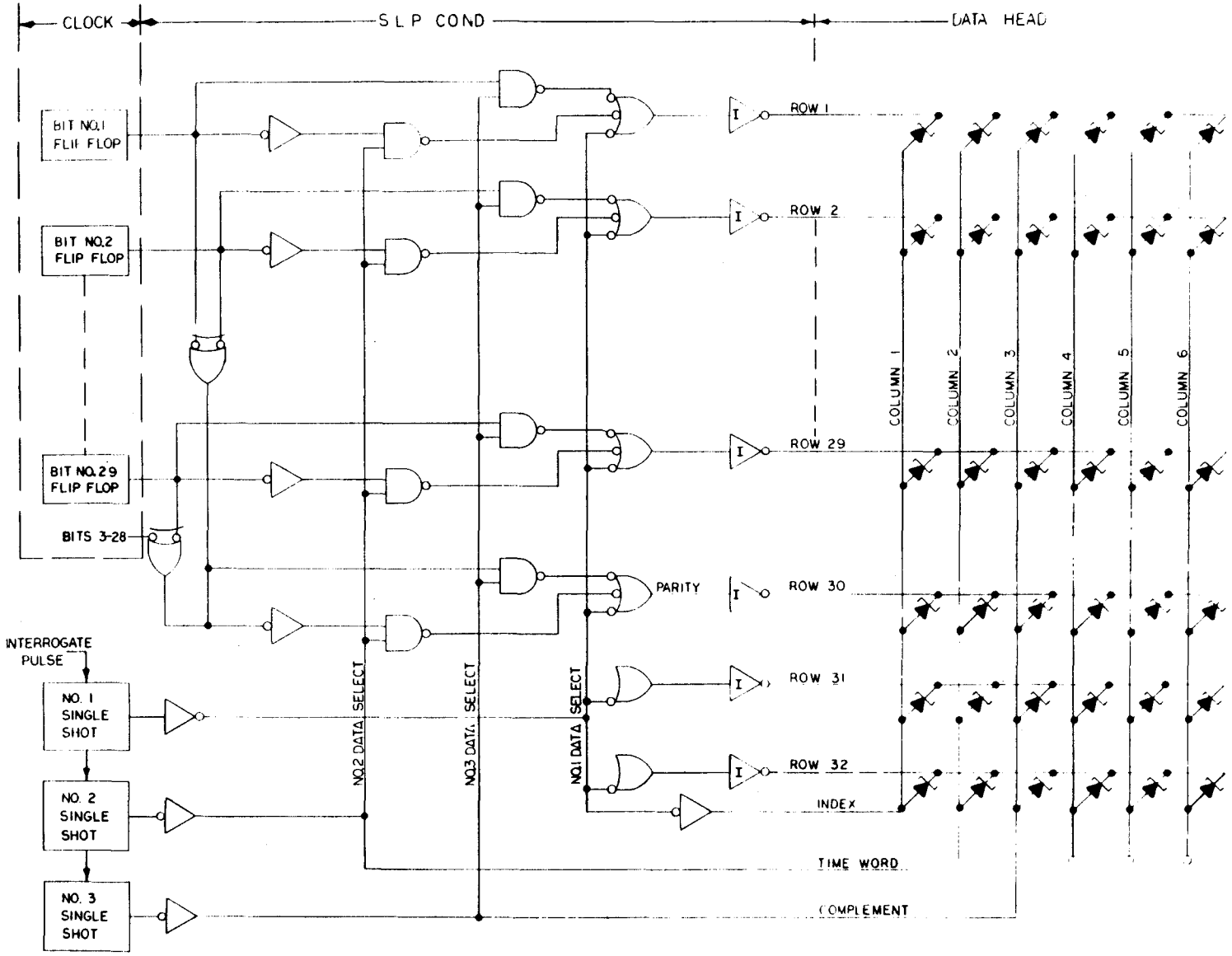


SLP CONDITIONER BLOCK DIAGRAM

ELECTRICAL DESIGN

SILICON LIGHT PULSER (SLP) CONDITIONER

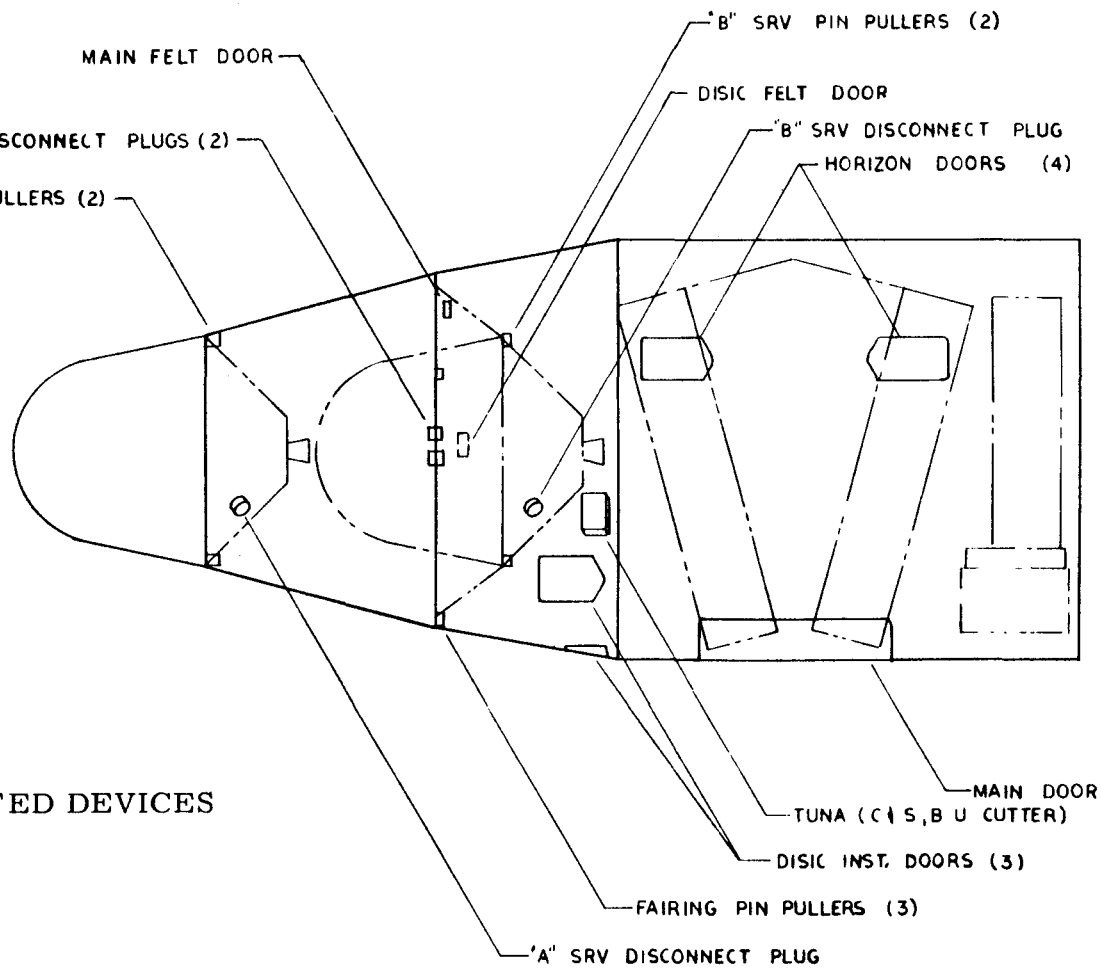
- CONDITIONS & SEQUENCES CLOCK PARALLEL BINARY TIME WORD TO SLP DATA HEADS IN CR.
- PROVIDES 30 BIT INDEX, TIME WORD, COMPLEMENT OF TIME WORD & PARITY UTILIZING THREE COLUMNS OF DATA HEAD FOR EACH INSTRUMENT.
- HAS CAPABILITY FOR TWO DISTINCT VARIABLE COLUMN DRIVE DURATIONS TO PROVIDE PROPER DOT INTENSITY FOR VARIOUS FILM ASA SPEEDS.
- UTILIZES SOLID STATE MICRO LOGIC INTEGRATED CIRCUITS FOR GATING AND SEQUENCING.



SILICONE LIGHT PULSER SYSTEM

ELECTRICAL DESIGN

PYRO ACTUATED DEVICES



ELECTRICAL DESIGN

PYRO SYSTEM

- ONE PLUG ON THE PAYLOAD/AGENA INTERFACE IS USED EXCLUSIVELY FOR SUPPLYING PYRO POWER AND PYRO RETURN TO THE PAYLOAD.
- EACH PYRO DEVICE IS ACTIVATED BY INDEPENDENT CIRCUITS FROM COMMAND TO SQUIB EXCITATION.
- A FUSISTOR PROTECTS EACH PYRO CIRCUIT.

PYRO EVENT & COMMAND DESCRIPTION

- IN-FLIGHT RESET (ORBIT MODE SIGNAL BACKUP)

  MAIN DOOR
  DISIC TERRAIN DOOR
  DISIC STELLAR #1 DOOR (R.H. LOOKING FORWARD)

- IN-FLIGHT RESET + 100 MILLISECONDS (ORBIT MODE SIG. BACKUP)

  LEFT HORIZON DOOR #1
  RIGHT HORIZON DOOR #1
  LEFT HORIZON DOOR #2
  RIGHT HORIZON DOOR #2
  DISIC STELLAR #2 DOOR (L.H. LOOKING FORWARD)

- KZ 38 (A TO B TRANSFER

  MAIN SEAL ASSEMBLY (LIGHT SEAL)
  MAIN WATER SEAL

- KZ 39 CUT & SPLICE (DISIC)
- "A" ARM

  DISIC CUT & SPLICE (IF NOT PREVIOUSLY ACTUATED BY KZ 39)
  MAIN SEAL ASSEMBLY)
  "A" MAIN WATER SEAL) IF NOT PREVIOUSLY ACTUATED BY KZ 38)
  "A" T/M BATTERY (SRV)
  "A" RECOVERY BATTERY (SRV)

- "A" TRANSFER

  DISIC SEAL ASSEMBLY (LIGHT SEAL)
  "A" THRUST CONE THERMAL BATTERIES (SRV)
  "A" DISIC WATER SEAL (SRV)

- "A" DISCONNECT

  SPIN OFF DISCONNECT P28A

ELECTRICAL DESIGN

PYRO EVENT & COMMAND DESCRIPTION (CONT'D)

- "A" SEPARATE

  "A" SRV PIN PULLERS
  NOTE: TEN SECONDS AFTER REMOVAL OF THE SEPARATE SIGNAL THE RECOVERY SWITCH-OVER CIRCUIT TRANSFERS THE RECOVERY COMMANDS TO THE "B" SRV.

- "B" ARM

  FAIRING SPIN OFF DISCONNECT PLUGS
  "B" T/M BATTERY (SRV)
  "B" RECOVERY PROGRAMMER BATTERY (SRV)
  BACKUP CUTTER (DISIC)

- "B" ARM + 100 MILLISECONDS

  FAIRING SEPARATE PIN PULLERS
  "B" MAIN WATER SEAL

- "B" TRANSFER

  "B" DISIC WATER SEAL (SRV)
  "B" THRUST CONE THERMAL BATTERIES (SRV)

- "B" DISCONNECT

  SPIN OFF DISCONNECT P28B

- "B" SEPARATE

  "B" SRV PIN PULLERS

POWER ESTIMATE

- MAXIMUM AVERAGE POWER (ASSUMING ALL PAYLOAD SUBSYSTEMS ARE OPERATED AT THEIR AVERAGE CURRENT SIMULTANEOUSLY)

  - UNREGULATED 24 VDC

	AMPS
CR INSTRUMENTS	20.00
DISIC	3.50
T/M SYSTEM	1.00
IMC SYSTEM	1.00
CLOCK	0.35
CLOCK CONDITIONER	0.50
A/P COMMAND SYSTEM	1.00
TOTAL	27.35
(APPROX.	30.0 AMPS)

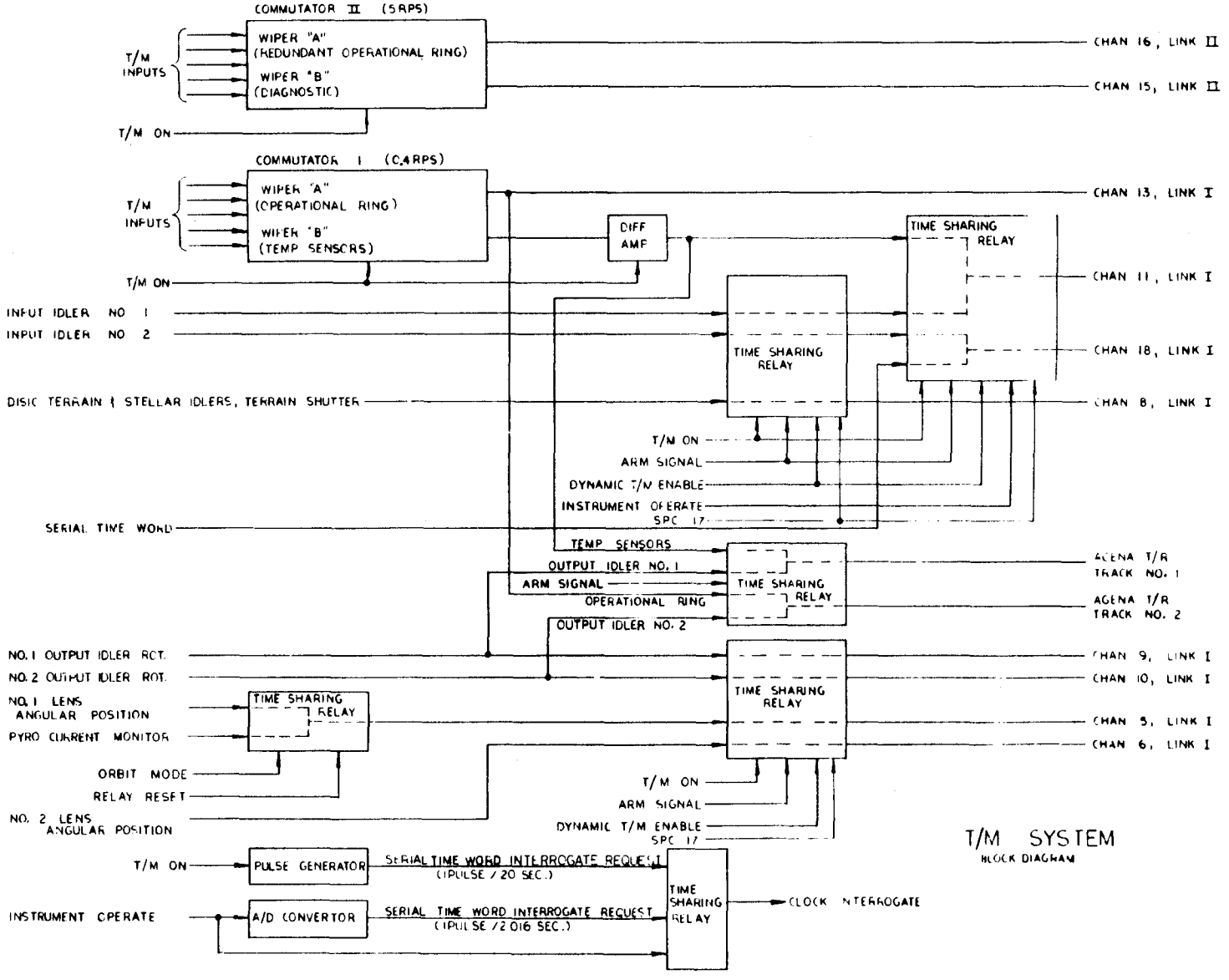
  - 115 V 400

CR INSTRUMENTS	0.50
IMC SYSTEM	0.07
TOTAL	0.57
(APPROX.	0.6 AMPS)

ELECTRICAL DESIGN

POWER DISTRIBUTION PLAN

- A POWER BUSS IS SUPPLIED FOR EACH POWER SOURCE.
  - A HIGH CAPACITY POWER BUSS RUNS FROM THE AGENA INTERFACE TO THE FORWARD END OF THE PAYLOAD.
  - FEEDER CABLING IS PROVIDED FROM THE MAIN BUSS TO EACH EQUIPMENT IN THE PAYLOAD.
  - A COMPATIBLE POWER RETURN SYSTEM IS USED THROUGHOUT THE SYSTEM.
- POWER SUPPLIED FROM THE AGENA INCLUDES + 24 VDC UNREGULATED AND 115 V 400
  - 5 V DC-DC CONVERTERS ARE USED FOR TELEMETRY EXCITATION & SLP CONDITIONER.
  - A $\pm$ 15 VDC CONVERTER IS USED IN THE IMC PROGRAMMER



T/M SYSTEM
BLOCK DIAGRAM

ELECTRICAL DESIGN

TELEMETRY SYSTEM

- PROVIDES INSTRUMENT OPERATIONAL DATA
  - TEMPERATURE
  - OPERATIONAL MODES
  - COMMAND MODES
  - CYCLES OF OPERATION
  - PAYLOAD CONSUMPTION
  - CLOCK SERIAL TIME WORD
- T/M CONTROL AND COMMAND DESCRIPTION
  - T/M ON (AGENA INTERFACE)
    - ENERGIZES ALL T/M CIRCUITS
    - RESETS CONTINUOUS T/M ENABLE
  - T/M DATA ENABLE
    - ENERGIZES ALL T/M CIRCUITS
  - INSTRUMENT OPERATE
    - ENERGIZES ALL T/M CIRCUITS
    - ENERGIZES RECOVERY TAPE RECORDER SYSTEM
  - DYNAMIC T/M ENABLE (SPC 17, KZ 38 & 39, ARM SIG.)
    - ENABLES CONTINUOUS T/M IF T/M ON IS PRESENT

ELECTRICAL DESIGN

T/M INSTRUMENTATION LIST

- SIX CONTINUOUS CHANNELS
  - TERRAIN IDLER, TERRAIN SHUTTER & STELLAR IDLER
  - PAN #1 OUTPUT IDLER ROTATION, 99/101 CLUTCH COMMAND
  - PAN #1 LENS ANGULAR POSITION, CENTER OF FORMAT COMMAND, PYRO CURRENT MONITOR DURING ASCENT
  - PAN #2 OUTPUT IDLER ROTATION, 99/101 CLUTCH COMMAND
  - PAN #2 LENS ANGULAR POSITION, CENTER OF FORMAT COMMAND
  - CLOCK SERIAL WORD (TIME SHARED WITH PAN #2 INPUT IDLER)
- FOUR COMMUTATED CHANNELS
  - TEMPERATURE MEASUREMENTS
    - TIME SHARED WITH PAN #1 INPUT IDLER
    - 0.4 RPS X 60 POINT COMMUTATOR RING B
      - 22 TEMP. SENSORS ON STRUCTURE & SKIN
      - 16 INSTRUMENT TEMP. SENSORS
      - 4 SRV TEMP. SENSORS
      - 2 DISIC TEMP. SENSORS
      - 2 BLAST SHIELD TEMP. SENSORS
      - 1 TEMP. SENSOR ON IMC PROGRAMMER
      - 1 PMU TEMP. SENSOR
  - OPERATIONAL CONTROL
    - 0.4 RPS X 60 POINT COMMUTATOR RING A
      - RTC & SPC STATUS MONITORS
      - PAN #1 & #2 CYCLE COUNTER MONITOR

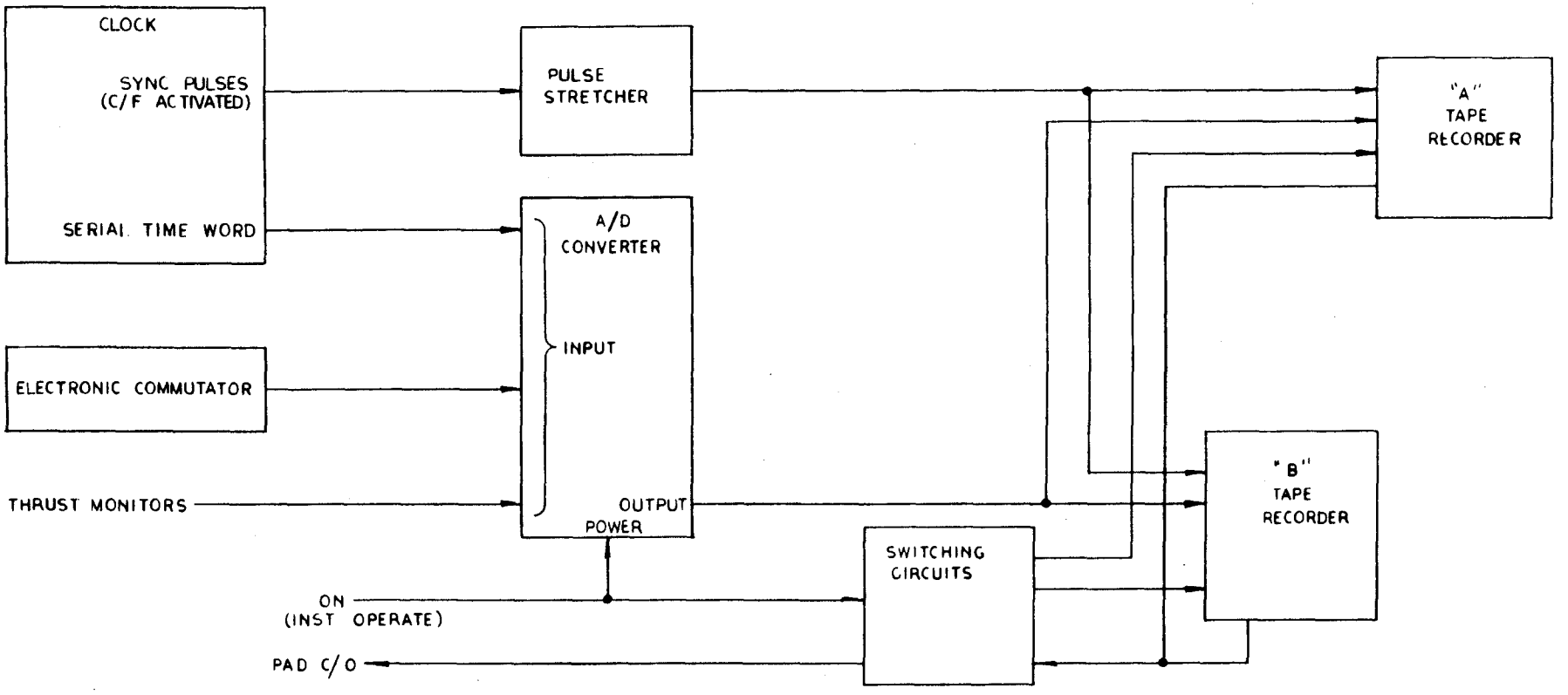
ELECTRICAL DESIGN

T/M INSTRUMENTATION LIST (CONT'D)

- TERRAIN CYCLE COUNTER
- SRV SEPARATIONS
- FAIRING SEPARATIONS
- PAN #1 & #2 FILM CHANGE DETECTOR
- SRV RECOVERY BATTERY MONITOR
- STELLAR & TERRAIN TAKE-UP DIAMETER
- PAN #1 & PAN #2 TAKE-UP DIAMETER

- REDUNDANT OPERATIONAL CONTROL
  - 5.0 RPS X 60 POINT COMMUTATOR RING A
- DIAGNOSTIC MEASUREMENTS
  - 5.0 RPS X 60 POINT COMMUTATOR RING B
    - WATER SEALS
    - METERING MONITORS
    - DOOR SEPARATIONS
    - PLATEN POSITIONS
    - YAW POSITION
    - CURRENT MONITORS
    - VOLTAGE MONITORS

ELECTRICAL DESIGN



TAPE RECORDER

ELECTRICAL DESIGN

TAPE RECORDER SYSTEM

- OPERATED FROM INSTRUMENT OPERATE COMMAND
- RECORDS DATA FROM TWO MAIN SOURCES:
  - DIGITAL DATA #1
    - OUTPUT OF AN A/D MULTIPLEXER
      - A/D MULTIPLEXER INPUTS:
        - AGENA THRUST MONITOR DATA (12 CHANNELS)
        - SERIAL TIME WORD FROM CLOCK (2 CHANNELS)
        - TWO ELECTRONIC COMMUTATOR OUTPUTS (2 CHANNELS)
  - DIGITAL DATA #2
    - TWO PULSE STRETCHER OUTPUTS
    - PULSE STRETCHERS DRIVEN BY CLOCK SYNC OUTPUTS
    - CLOCK SYN. OUTPUTS DRIVEN BY MAIN INSTRUMENTS CENTER OF FORMAT PULSES
- DIGITAL CLOCK SYNC
  - TIME BASE FROM A/D CONVERTER
  - 10 KC PULSE RECORDED ON BOTH CHANNELS

ENGINEERING ANALYSIS

FAILURE MODES ARE DISCUSSED IN DETAIL FOR EACH OF THE MAJOR SUBSYSTEMS IN THE FOLLOWING DOCUMENTS:

- ENGINEERING ANALYSIS REPORT - T/M SUBSYSTEM T9-6-041
- ENGINEERING ANALYSIS REPORT - EXPOSURE CONTROL SUBSYSTEM T9-6-037
- ENGINEERING ANALYSIS REPORT - COMMAND SUBSYSTEM T9-6-042
- ENGINEERING ANALYSIS REPORT - J-3 PYROTECHNIC SUBSYSTEM T9-6-036
- ENGINEERING ANALYSIS REPORT - PMU SUBSYSTEM T9-6-039
- ENGINEERING ANALYSIS REPORT - DIGITAL TAPE RECORDER SUBSYSTEM T9-6-038
- ENGINEERING ANALYSIS REPORT - IMC SUBSYSTEM T9-6-034
- ENGINEERING ANALYSIS REPORT - SLP DATA CONDITIONER T9-6-035
- ENGINEERING ANALYSIS REPORT - POWER SUBSYSTEM T9-6-040

ELECTRICAL DESIGN

BIBLIOGRAPHY

- A/P INTERFACE DOCUMENTS

  T3-5-019 ELECTRICAL INTERFACE SPECIFICATION FOR THE J-3 CONSTANT ROTATOR SYSTEM

  T3-5-020 ELECTRICAL INTERFACE SPECIFICATION FOR THE J-3 SRV SYSTEM

  T3-5-021 ELECTRICAL INTERFACE SPECIFICATION FOR THE J2-J3 DISIC SYSTEM

  T3-5-023 ELECTRICAL INTERFACE SPECIFICATION FOR ADVANCED PROJECTS PAYLOAD AND [redacted]AGENA ORBITAL VEHICLE

- A/P DESIGN CONTROL SPECIFICATIONS

  T3-5-028 ADVANCED PROJECTS DESIGN CONTROL SPECIFICATION FOR J-3 SYSTEM

ELECTRICAL DESIGN