MAINTENANCE HANDBOOK
NO. 2B ELECTRONIC SWITCHING SYSTEM

This section is intended to serve as a "memory-jogger" for experienced personnel. The use of this section is recommended solely for those familiar with the No. 2B ESS maintenance and operations. In all cases of doubt or discrepancy the user should refer to the appropriate source document, listed on pages 8—13. This information is also available in a pocket size reference manual under ordering code 405—035. Refer to Section 000-010-013 for ordering details.

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GENERAL CAUTIONS PERTAINING TO CIRCUIT PACKS

Caution 1: Circuit packs should be handled by their edges or faceplates to avoid deforming components and leads or scratching the gold plated connector contacts. Touching connector contacts also contaminates gold plating and causes poor connections.

Caution 2: Before removing or inserting a circuit pack, power must be removed from the circuit unless the trouble locating manual indicates otherwise.

Caution 3: When changing circuit packs in attempting to locate a trouble, always restore a pack to its original location if the replacement pack does not clear the trouble. This will aid in isolating the trouble by returning the circuit to its original configuration which existed at the time the failure was first detected.

Caution 4: Do not block relays non-operated (normal) which are operated by a peripheral decoder circuit pack. This condition allows too much current to flow because the current limiting resistor is not cut in. This may damage the peripheral decoder circuit pack.

GENERAL CAUTIONS PERTAINING TO FERREED CIRCUITS

Caution 1: Exercise care when handling pulse path leads. The ferreed pulser circuit operates on a "floating voltage" principal and is above ground potential.

Caution 2: Do not break current flow in a network path by opening ferreed contacts manually through a TTY request to perform a network order. This may cause ferreed contacts to weld together.

ABBREVIATIONS

AI	— Address Input (register)	MAR	— Microaddress Register
AK	— Address Mask (register)	MARP	— MAR Parity
AMA	— Automatic Message Accounting	MAS	— Main Store
AR	— Operand Register A	MASB	— MAS Bus
ASW	— All Seems Well	MASC	— MAS Controller
ATP	— All Test Pass	MASCM	— MASC and Memory Unit
BA	— Branch Allowable	MASM	— MAS Memory Unit
BDSR	— Block Double Store Read	MASMO	— MAS Memory Module
BEC	— Block Error Recovery (flip-flop)	MCH	— Maintenance Channel
BHC	— Block Hardware Check (flip-flop)	MCHB	— MCH Buffer
BIN	— Block Interrupt (flip-flop)	MCHC	— MCH Command (register)
BR	— Operand Register B	MCHTR	— MCH Transmit/Receive (register)
BSA	— Branch Save Address	MCS	— Microcontrol Status (register)
BSAI	— Branch Save Address Indirect	MIR	— Microinstruction Register
BTC	— Block Timer Check	MIS	— Microstore
C	— Clear	MK	— Marker
CA	— Control Bit A	MLHG	— Multiline Hunt Group
CB	— Control Bit B	MMS	— Main Memory Status (register)
CF	— Condition Flip-Flop	MRF	— Maintenance Reset Function
CKT	— Circuit	MS	— Master Scanner
CLE	— Clock Error	MSR	— Maintenance State Register
CLID	— Calling Line Identification Table	MTCE	— Maintenance Frame
CONC	— Concentrator	NA	— Next Address
CONTR	— Controller	NAND	— Not-And (gate)
CPD	— Central Pulse Distributor	NS	— Nanosecond
CR	— C Register	NWK	— Network
CS	— Channel Select	OP	— Operation (code)
CU	— Control Unit	OPF	— OP Code Fil (bit)
CW	— Complement Write	OR	— Originating Register
DI	— Data Input (register)	ORD	— Order
DK	— Data Mask (register)	PA	— Program Address
DML	— Data Manipulation Logic	PA+1	— Program Address Plus 1 (logic)
DR	— Data Ready	PD	— Peripheral Decoder
DS	— Data Manipulation Logic Status	PH	— Parity High
DSR	— Double Store Read	PL	— Parity Low
DT²L	— Diode Modified Transistor Transistor Logic	PNA	— Parity Bit of Next Address
ENV	— Enable Verify	POB	— Peripheral Order Buffer
ER	— Error Register	PROC	— Processor Frame
ERAR	— Error Return Address Register	PROM	— Programmable Read Only Memory
ERU	— Error Return Address Update	PS	— Program Store
EXT	— External	PT	— Program Timer
FCG	— False Cross and Ground	PTA	— Parity Bit For Current Address
FR	— Function Register	RAR	— Return Address Register
GP	— Group	RC	— Recent Change
HG	— Hold Get (register)	RE	— Range Extension
HIC	— Hybrid Integrated Circuit	REQ	— Request (flip-flop)
IB	— Instruction Buffer	RI	— Register and Immediate Data
ID	— Instruction or Data (flip-flop)	RN	— Immediate Operand to Register
IDL	— Idle (flip-flop)	RR	— Register to Register
IFF	— I Flip-Flop	RU	— RAR Update
INH	— Inhibit	R/W	— Read/Write (flip-flop)
I/O	— Input/Output	RXN	— References Memory by Adding N to an Address Register Pair
IOC	— I/O Channel		
IOD	— I/O Data (register)	RXR	— References Memory by Adding an Index Register to an Address Register
IOS	— I/O Status (register)		
IOSC	— I/O Subchannel	S	— Set
ISO	— Isolate (flip-flop)	SAR	— Store Address Register
JNCTR	— Junctor	S-A-0	— Stuck-at-Zero
LED	— Light-emitting Diode	S-A-1	— Stuck-at-One
LON	— Lock On-line	SCNR	— Scanner
LTPE	— Long Term Periodic Exercise	SCPD	— Supplementary Central Pulse Distributor
MAN	— Manual	SDR0	— Store Data Register Zero

ABBREVIATIONS (Cont)		
SDR1 — Store Data Register One	STE	— Stable Timing Entry
SERC — Store Error Register C	TA	— Transfer Allowable
SIB — Store Instruction Buffer	TC	— Timing Counter
SIC — Silicon Integrated Circuit	TCR	— Transient Call Record
SIR0 — Store Instruction Register Zero	TDC	— Tape Data Controller
SIR1 — Store Instruction Register One	TMR	— Terminal Memory Record
SL — Specifies 20-Bits to Load a Register Pair of Reference Memory	TR1	— Test Register 1 (flip-flop)
	TR2	— Test Register 2 (flip-flop)
SMAS — Supplementary MAS Frame	TTY	— Teletypewriter
SOP — Set OPF (bit)	TTYC	— TTY Controller
SOS — Store-Out-Of-Sync (flip-flop)	UPD	— Update (flip-flop)
SS — Specifies 8-bit Offset in Branch Operation	ZOP	— Zero OPF bit
SSP — System Status Panel	3A CC	— 3A Central Control

NO. 2B ESS BSP INDEX

NO. 2B ESS BSP INDEX (Cont)

NO. 2B ESS BSP INDEX (Cont)

NO. 2B ESS BSP INDEX (Cont)

ODA TRANSLATION ADMINISTRATION RECORDS

LINES

ESS 2100-R	Directory Number Record
ESS 2105-R	Multiline Hunt Group Record
ESS 2170-R	Speed Calling Record
ESS 2171-R	Terminal Equipment Number Record
ESS 2306-R	Line Class Code Record
ESS 2502-R	Abbreviated Class Record

TRUNKS, SERVICE CIRCUITS, and JUNCTORS

ESS 2200-R	UTJF Equipment Record
ESS 2201-R	Trunk Assignment Record
ESS 2202-R	Trunk Group Record
ESS 2203-R	Junctor Grouping Frame Vertical Record
ESS 2206-R	Junctor Group Record
ESS 2216-R	Carrier Group Record
ESS 2270-R	MTF Equipment Record
ESS 2505-R	Automatic Trunk Test Record

ROUTING AND CHARGING

ESS 2209-R	Incoming Trunk Translation Record
ESS 2300-R	3- and 6-Digit Record
ESS 2301-R	Rate and Route Record
ESS 2302-R	Charge Index Record
ESS 2303-R	Route Index Record
ESS 2302-3C-R	Daily Charge Rate Record
ESS 2304-R	Code Group Record

SCANNERS

ESS 2504-R	Trunk Scanner Definition Record
ESS 2573-R	Line Scanner Definition Record
ESS 2576-R	Scan Point Assignment Record
ESS 2577-R	Pseudo Scan Point Assignment Record
ESS 2506-R	Alarm Monitor Data Record

MISCELLANEOUS

ESS 2500-5P-R	TTY Channel Assignment
ESS 2500-5C-R	MTI Capacity and Office Options Record
ESS 2501-R	Office Code Record
ESS 2503-5F-R	Network Definition Record
ESS 2508-R	Range Extension Record
ESS 2509-R	Recorded Announcement Record
ESS 2575-R	CPD and PD Assignment

TRAFFIC

ESS 2471-R	Traffic Work Table Record
ESS 2473-R	Traffic Variable Assignment Record

CENTREX

ESS 2108-R	Centrex Console Record
ESS 2109-9A-R	Centrex Group Record
ESS 2109-9B-R	Centrex Dialing Assignment Record
ESS 2109-9C-R	Centrex Console Lamp Record
ESS 2172-R	*Centrex Speed Call List Record
ESS 2173-R	*Centrex Speed Calling Group Record
ESS 2174-R	*Centrex Call Pickup Group Record
ESS 2202-3-R	Centrex Trunk Group Record
ESS 2208-R	Centrex Data Link Frame Record
ESS 2213-R	*Automatic Identified Outward Dialing Record
ESS 2215-R	Manual Trunk Disposition and Trunk Billing Index Record
ESS 2307-R	Centrex Screening Record

* This record will be available in the near future if not available at the time of the publication of this document.

TROUBLE LOCATING MANUALS

Automatic Message Accounting	TLM-2H066
Supplementary CPD	TLM-2H071-02
Line Scanner	TLM-2H076-02
Master Scanner	TLM-2H092-02
Trunk Junctor and Service Circuit	TLM-2H100
Ringing and Tone Plant	TLM-2H126
Recorded Announcement Frame	TLM-2H139
Universal Scanner	TLM-2H161-02
Line and/or Trunk Switching Circuit	TLM-2H163-02
CTX Data Link Circuit	TLM-2H265
AIOD Circuit	TLM-2H301
Common Systems Processor	TLM-1C900-01

PROGRAM RELATED DOCUMENTS

Office Data Tables Layout Specifications	PA-2H300
Maintenance Programmers Reference Manual	PK-1C900-01
Application Portion of Maintenance Reference Manual	PK-2H140
Command Manual	PD-2H000
Command Manual (Common Systems)	PK-1C901-01
2B Command Manual	PK-2H361-001
Input Message Manual	IM-2H200
Output Message Manual	OM-2H200
Program Store and Documentation Index	PG-2H003

INDEX OF 2B PROCESSOR DIAGNOSTICS

TEST NUMBER	SYMBOLIC NAME	DESCRIPTION	PR-IC ____
1	MCH	Maintenance channel	912
2	BUS	Gating bus	912
3	CLOCK	System clock	912
4	INITIAL	Verification of initialization by monitor	912
5	TO	"TO" decoder	913
6	FROM	"FROM" decoder	913
7	MULFRXP	Test for multiple firing "FROM" crosspoints	914
8	MULTOXP	Test for multiple firing "TO" crosspoints	914
9	GATEGEN	General registers	915
10	GATESP	Special registers	915
11	MICMEM	Micromemory	916
12	LOADFR	Function register	917
13	ADDER	Add function	917
14	DMLCMP	Matcher for duplicate DML	917
15	BOOLEAN	Boolean logic functions	917
16	FLZ	Find low zero function	917
17	ROTATE	Rotate function	917
18	PACK	Pack and unpack gating operations	917
19	MICSEQ	Microcontrol part 1	919
20	MICSEQ2	Microcontrol part 2	919
21	MICSEQ3	Microcontrol part 3	919
22	MICSEQ4	Microcontrol part 4	919
23	DSFLOP	DS flip-flop	920
24	PAPLUS1	Address increment adder	920
25	MAINSEQ	Store bus controller part 1	921
26	MNSEQ2	Store bus controller part 2	921
27	STI01	Unlock and test on-line CC I/O access to off-line store	922
28	STI02	Store controller's I/O order decoder	922
29	STMX1	One half of store controller's multiplex circuits	923
30	STMX2	Other half of store controller's multiplex circuits	923
31	STMX3	One half of store controller's check circuits	923
32	STMX4	Other half of store controller's check circuits	923
33	STBS1	Store command portion of store bus	924
34	STBS2	Store address portion of store bus	924
35	STBS3	Store data portion of store bus	924
36	STBS4	Store data portion of store bus	924
37	STCP1	Bus control circuitry	934
38	STCP2	Data parity control circuitry	934
39	STCP3	Data parity control circuitry	934

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TEST NUMBER	SYMBOLIC NAME	DESCRIPTION	PR-IC _____
40	STCP4	Data parity check circuits	934
41	STFB1	Refresh select signals to fanout boards	925
42	STFB2	Normal select signals to fanout boards	925
43	STFB3	Store address signals through fanout board	925
44	STFB4	Store address signals through fanout board	925
45	STFB5	Fanout board address parity checkers	926
46	STFB6	Fanout board address parity checkers	926
47	STFB7	Store timing signals through fanout boards	926
48	STFB8	Store timing signals through fanout boards	926
49	STWP1	Write protect reads and writes	927
50	STWP2	Write protect reads and writes	927
51	STWP3	Write protect check circuit	927
52	STON1	Store bus from on-line CC to off-line CC	928
53	STDF1	Data register to/from memory modules	935
54	STDF2	Data register to/from memory modules	935
55	STDF3	Data register to/from memory modules	935
56	STDF4	Data register to/from memory modules	935
57	STDT1	Memory module 0	929
58	STDT2	Memory module 1	929
59	STDT3	Memory module 2	929
60	STDT4	Memory module 3	929
61	STDT5	Memory module 4	929
62	STDT6	Memory module 5	929
63	STDT7	Memory module 6	929
64	STDT8	Memory module 7	929
65	MINTERP	Microinterpret operation	930
66	MTMSCXP	Test for multiple firing miscellaneous crosspoints	930
67	DMLPAR	DML parity generator	930
68	BUSPAR	Bus parity check	930
69	POXYPAR	IB register X and Y field parity generator and parity check	930
70	TIMERS	Program timer, timing counter	931
71	INTRUPT	Interrupts	931
72	ADMTCH	Panel address matcher	931
73	DTMTCH	Panel data matcher	931
74	IO	I/O channels	931
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76	STATUS2	Status bits, timeouts	932
77	DGSSP	System status panel	932
78	DSRDG	Double store read	911

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TEST NUMBER	SYMBOLIC NAME	DESCRIPTION	PR-IC _____
79		(Spare)	
80		Application microcode	-2H351
81	MODEDEC	2B I/O channel select (No. 2B ESS only)	-2H350
82	REGCHEK	Register access (No. 2B ESS only)	-2H350
83	RUNFF	2B I/O run flip-flop (No. 2B ESS only)	-2H350
84	OLRUNFF	2B I/O on-line access to off-line run flip-flop (No. 2B ESS only)	-2H350
85	PULSGEN	2B I/O CPD pulses (No. 2B ESS only)	-2H350
86	EAXPUA	2B I/O EA to PUA translators (No. 2B ESS only)	-2H350
87	CPDTST	2B I/O CPD crosspoint translator and output current control (No. 2B ESS only)	-2H350
88	DPTST	2B I/O dial pulse timing (No. 2B ESS only)	-2H350
89	PWRMISC	2B I/O external orders and power test (No. 2B ESS only)	-2H350
90	TRBLSHT	2B I/O falling order sequences. This is not a test but a utility debugging aid.	-2H350

2B—EF-1 PROGRAM INDEX

PROGRAM	PR-NUMBER	PROGRAM	PR-NUMBER	PROGRAM	PR-NUMBER
ADLINK	2H230-03	CIPL	1C953-01	OLOAD	2H135-02
ADMBL	2H231-02	CLID	2H225-03	OPSVC	2H119-03
ADMCTX	2H316-02	CNOPER	2H226-03	ORIG	2H203-03
ADMISC	2H232-02	CNRUTL	1C954-01	OUTCAL	2H208-03
ADMLIN	2H233-02	COIN	2H217-03	PATHNT	2H214-02
ADMSUB	2H234-02	CPAGM	1C955-01	POBD	2H200-03
ALIT	2H114-03	CPATCH	1C970-01	POBE	2H219-03
AMAM	2H132-03	CSTATS	1C932-01	POBFAL	2H223-03
AMAPGM	2H113-03	CSUB	2H038-02	POBL	2H216-03
ATCAL	2H310-02	CSYSUB	1C956-01	POBM	2H102-02
ATDIG	2H309-02	CTAPH	1C957-01	PUETR	2H104-02
ATMON	2H308-02	CTAPM	1C958-01	PUMON	2H045-02
ATSER	2H311-02	CTC	1C968-01	PUMONA	2H105-03
ATSUB	2H312-02	CTSD	1C959-01	PURCV	2H058-02
AUDIT	2H109-03	CTTYH	1C960-01	PURCVA	2H134-02
AUDNET	2H130-02	CTTYT	1C961-01	RACOMP	2H108-03
BLMM	2H013-02	CTXCC	2H303-02	RAF	2H127-02
BLMMA	2H125-03	CTXCFR	2H302-02	RCSUB	2H220-02
CBLM	1C950-01	CTXDGT	2H304-02	RETEST	2H137-02
CCSER	2H211-03	CTXIOD	2H306-02	RING	2H205-03
CDGDSR	1C911-01	CTXLT	2H307-02	ROTL	2H315-02
CDGFN	1C917-01	CTXSUB	2H301-02	RTP	2H126-02
CDGMCH	1C912-01	CTXTRK	2H305-02	SCDIG	2H025-02
CDGMC1	1C919-01	CUT	2H131-03	SCPDD	2H042-02
CDGMI	1C930-01	CUTIL	1C962-01	SPCCT	2H314-02
CDGMIC	1C916-01	DIGRTN	2H204-03	SRTT	2H122-03
CDGMLT	1C914-01	DISCON	2H210-03	SUB	2H212-03
CDGMSQ	1C921-01	DTC	1C975-02	TC2B	2H357-01
CDGNM	1C910-01	ERANL	2H129-02	TC2W	2H133-03
CDGNOF	1C933-01	FORMAT	2H015-02	TC2WB	2H353-01
CDGNTI	1C931-01	HIGDRY	2H224-03	TC2W2	2H141-03
CDGREG	1C915-01	INITA	2H124-02	TC2W3	2H142-03
CDGSBS	1C924-01	INPUT	2H202-03	TKMON	2H111-03
CDGSD	1C929-01	IOCCD	2H350-02	TKMTC	2H112-03
CDGSFA	1C925-01	IO25M	2H107-03	TKORG	2H206-03
CDGSFB	1C926-01	JASINT	2H128-02	TKSUB	2H100-03
CDGSIO	1C922-01	JCMTC	2H101-02	TPANEL	2H110-03
CDGSMX	1C923-01	LAYOUT	2H222-03	TRACE	2H221-03
CDGSON	1C928-01	LOCCHG	2H218-03	TRAFIC	2H116-03
CDGSWP	1C927-01	LTD	2H115-02	TTYAPP	2H352-01
CDGS3A	1C918-01	MAGER	2H136-03	TTYB	2H016-02
CDGTO	1C913-01	MASACS	2H355-01	TTYTBL	2H354-01
CDSPA1	1C920-01	NETFAB	2H118-02	TWOMIC	2H351-02
CGAP	2H313-02	NTDIG	2H106-02	UTILITY	2H014-02
CINIT	1C952-01	OGOPTK	2H209-03	XLATE	2H213-03

3A CC INSTRUCTION SET

INSTRUCTION	LENGTH	OP CODE (OCTAL)	DATA FIELDS	
AI R1, I	D	007	R1	0
AN R1, N	S	011	R1	N
AR R1, R2	S	003	R1	R2
A1S Y	D	076	2	—
B Y	S	126/127		OFFSET
BC Y	S	130/131		OFFSET
BCL Y	D	120	0	—
BL Y	D	076	0	—
BNC Y	S	132/133		OFFSET
BNCL Y	D	121	0	—
BPAX R1	S	134	0	R1
BR N (RA)	S	125	0/1	N
BRX R1 (RA)	S	125	2/3	R1
BSA Y	D	076	1	—
BSAI X	S	166		X
BTSA	S	135	0	0
BTSAG	S	135	1	0
BTSAGN N	S	135	2	N
BTSAN N	S	135	3	N
BX R1, Y	D	074	R1	—
CI R1, I	D	007	R1	5
CIRM R1, I, N, M	D	037	R1	N
COFL N (RA)	S	173	0/1	N
COFL R1 (RA)	S	173	2/3	R1
COM R1 [R2]	S	033	R1	R1/[R2]
CONL N (RA)	S	172	0/1	⬦N
CONL R1 (RA)	S	172	2/3	R1
CR R1, R2	S	040	R1	R2
CRM R1, R2, M	D	036	R1	R2
EXR R1, R2	S	016	R1	R2
FLX R1, R2	S	041	R1	R2
GA	S	163	0	0
GN R1, N	S	164	R1	N
HA	S	163	1	0
HALT	S	135	6	0
HN R1, N	S	165	R1	N
ICF R1, N	S	060	R1	N
IRM R1, R2, M	D	034	R1	R2

3A CC INSTRUCTION SET (Cont)

INSTRUCTION	LENGTH	OP CODE (OCTAL)	DATA FIELDS	
L R1, N (RA)	S	100/101	R1	N
LA R1, N (RA)	S	102/103	R1	N
LAL R1, Y, RA	D	062/063	R1	—
LAX R1, R2 (RA)	S	106/107	R1	R2
LI R1, I	D	007	R1	1
LL R1, Y	D	061	R1	—
LN R1, N	S	006	R1	N
LR R1, R2	S	014	R1	R2
LRM R1, R2, M	D	035	R1	R2
LRS R1, RS	S	042	R1	RS
LSR RS, R1	S	017	RS	R1
LX R1, R2 (RA)	S	104/105	R1	R2
MI	D	027	—	—
MIS	D	026	—	—
MSTF N (RA)	D	001	0/1	N
MSTFX R1 (RA)	D	001	2/3	R1
NI R1, I	D	007	R1	2
NOP	S	014	0	0
NR R1, R2	S	030	R1	R2
OI R1, I	D	007	R1	3
OR R1, R2	S	031	R1	R2
PACK RS	S	024	RS	0
PIE	S	135	4	0
RL R1, R2	S	022	R1	R2
RLN R1, N	S	021	R1	16-N
RR R1, R2	S	023	R1	R2
RRN R1, N	S	021	R1	N
SBN R1, B	S	054	R1	B
SBR R1, R2	S	055	R1	R2
SBS N (RA), B	S	142/143	B	N
SCF	S	040	0	0
SI R1, I	D	007	R1	0
SIO	S	047	0	0
SMIO	S	047	2	0
SN R1, N	S	010	R1	-N
SOP	S	015	0	1
SR R1, R2	S	012	R1	R2
ST R1, N (RA)	S	110/111	R1	N
STA R1, N (RA)	S	112/113	R1	N

3A CC INSTRUCTION SET (Cont)

INSTRUCTION	LENGTH	OP CODE (OCTAL)	DATA FIELDS	
STAF N (RA)	D	174	0/1	N
STAF R1 (RA)	D	174	2/3	R1
STAL R1, Y, RA	D	072/073	R1	—
STAX R1, R2 (RA)	S	116/117	R1	R2
STL R1, Y	D	071	R1	—
STM R1, N (RA), M	D	004/005	R1	N
STVM R1, N (RA)	S	146/147	R1	N
STX R1, R2 (RA)	S	114/115	R1	R2
TBN R1, B	S	050	R1	B
TBR R1, R2	S	051	R1	R2
TBS N (RA), B	S	122/123	B	N
TCC1	S	137	1	F
TCH	S	047	6	0
TIO	S	047	4	0
TMIO	S	047	5	0
TRPH R1	S	136	1	R1
TRPL R1	S	136	0	R1
TSRPH RS	S	137	1	RS
TSRPL RS	S	137	0	RS
TZ R1	S	030	R1	R1
UNPK RS	S	025	0	RS
XI R1, I	D	007	R1	4
XR R1, R2	S	032	R1	R2
ZBN R1, B	S	044	R1	B
ZBR R1, R2	S	045	R1	R2
ZBS N (RA), B	S	144/145	B	N
ZCF	S	011	0	0
ZIO	S	047	7	0
ZOP	S	015	0	0
ZR R1	S	006	R1	0

2B INSTRUCTION SET

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL	INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
AAXCA	(H)	003	00	CAXLR	(H)	003	03
AAXGR	(H)	011	17	CFXBIN	(H)	116	15
AAXLR	(H)	003	01	CFYGR	(H)	116	01
AAXRF	(H)	033	00	CLB	(H)	001	00
ADD	(H)	016	00	CØM	(H)	031	03
ADV8	(F) (Note 1)	00004027		CØMG	(H)	131	03
*ADV16	(F) (Note 1)	00004037		CØMS	(H)	030	03
AD1AA	(H)	004	00	CØMSG	(H)	130	03
AD1CA	(H)	004	01	DATA	(H)	033	14
*AD1CS	(H)	011	00	*DATAD (Note 1)	(F)	03074013	
AD1GR	(H)	004	02	*DATAOD (Note 1)	(F)	03074007	
AD1HG	(H)	116	00	*DATARCT	(H)	033	13
AD1MC	(H)	004	03	*DE1AA	(H)	024	00
*AD16AA	(H)	004	04	*DE1CA	(H)	026	00
*AD16CA	(H)	004	06	*DE1GR	(H)	025	00
AD4AA	(H)	004	10	DE1HG	(H)	116	02
AD4CA	(H)	004	12	DE1KR	(H)	116	03
AD8AA	(H)	004	14	DFHXGR	(H)	001	16
AD8CA	(H)	004	16	DLF	(H)	001	01
AGC	(H)	031	02	EAXGR	(H)	001	10
AGCG	(H)	131	02	FIL__	(H) (Note 3)	05x	—
AGCS	(H)	030	02	FLZT__	(H)	111	—
AGCSG	(H)	130	02	GAA	(H)	025	17
ALC	(H)	031	04	GCA	(H)	025	15
ALCG	(H)	131	04	GCPART	(F) (Note 1)	00074600	
ALCS	(H)	030	04	*GEA	(H)	025	10
ALCSG	(H)	130	04	GGR	(H)	025	07
ANC	(H)	031	01	GKF	(H)	125	04
ANCG	(H)	131	01	GKM	(H)	025	06
ANCS	(H)	030	01	*GLM	(H)	025	04
ANCSG	(H)	130	01	GLR	(H)	025	03
AND__	(F) (Note 2)	074	—	*GLW	(H)	025	02
ANL	(H)	031	10	GLYAD18	(H)	116	16
ANLG	(H)	131	10	GLYAD	(H)	116	17
ANLS	(H)	030	10	GRA	(H)	125	00
ANLSG	(H)	130	10	GRFT	(H)	125	14
BINXCF	(H)	116	14	GRXAA	(H)	012	17
CAXAA	(H)	003	02				
CAXGR	(H)	011	15				

2B INSTRUCTION SET (Cont)

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL	INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
GRXCA	(H)	012	15	HLR (L)	(H)	024	03
GRXDFH	(H)	012	16	HLR (R)	(H)	124	03
GRXEA	(H)	012	10	*HLW (L)	(H)	024	02
GRXHG	(H)	116	07	*HLW (R)	(H)	124	02
GRXLM	(H)	012	04	HRA	(H)	125	02
GRXLR	(H)	012	03	HTB	(H)	125	12
*GRXLW	(H)	012	02	KMYGR	(H)	011	06
GRXMC	(H)	003	06	KRYGR	(H)	003	11
GRXM0	(H)	022	00	KRYLR	(H)	003	12
GRXM1	(H)	022	01	*LAA__	(F) (Note 2)	154	—
GRXM2	(H)	022	02	*LCA__	(F) (Note 2)	155	—
GRXM3	(H)	022	03	LDFH_	(H)	027	—
*GRXM4	(H)	022	04	LFYGR	(H)	033	03
*GRXM5	(H)	022	05	LGR__	(F) (Note 2)	006	—
*GRXM6	(H)	022	06	*LKR__	(F) (Note 2)	005	—
*GRXM7	(H)	022	07	LLM__	(F) (Note 2)	007	—
GRXRF	(H)	033	01	LLR__	(F) (Note 2)	112	—
GRXXLW	(H)	003	07	LMXGR	(H)	011	04
GRYCF	(H)	116	06	LRXAA	(H)	003	04
GRYKM	(H)	012	06	LRXCA	(H)	003	05
GRYKR	(H)	003	10	LRXGR	(H)	011	03
GRYLF	(H)	033	02	LRXMC	(H)	003	13
GT__	(H)	013	—	LRYKR	(H)	003	14
GTB	(H)	125	10	LWXGR	(H)	011	02
GZT	(H)	002	00	LWXLR	(H)	003	15
HAA (L)	(H)	024	17	MA	(H)	031	11
HAA (R)	(H)	124	17	MAG	(H)	131	11
HCA (L)	(H)	024	15	MAS	(H)	030	11
HCA (R)	(H)	124	15	MASG	(H)	130	11
*HEA (L)	(H)	024	10	MCXGR	(H)	003	16
*HEA (R)	(H)	124	10	MCXG0	(H)	122	00
HGR (L)	(H)	024	07	MCXG1	(H)	122	01
HGR (R)	(H)	124	07	MCXG2	(H)	122	02
HGXGR	(H)	116	10	MCXG3	(H)	122	03
HKF	(H)	125	06	*MCXG4	(H)	122	04
HKM (L)	(H)	024	06	*MCXG5	(H)	122	05
HKM (R)	(H)	124	06	*MCXG6	(H)	122	06
*HLM (L)	(H)	024	04	*MCXG7	(H)	122	07
*HLM (R)	(H)	124	04	MCXLR	(H)	003	17

2B INSTRUCTION SET (Cont)

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL	INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
MFXPDO	(F) (Note 1)	00074200		ØR__	(F) (Note 2)	174	—
MS1LT	(F) (Note 1)	00045440		ØRC	(H)	031	07
MS1T	(F) (Note 1)	00045400		ØRCG	(H)	131	07
MS1WLT	(F) (Note 1)	00045460		ØRCS	(H)	030	07
MS1WT	(F) (Note 1)	00045420		ØRCSG	(H)	130	07
*MS16LT	(F) (Note 1)	00045444		ØRL	(H)	031	16
*MS16T	(F) (Note 1)	00045404		ØRLG	(H)	131	16
*MS16WLT	(F) (Note 1)	00045464		ØRLS	(H)	030	16
*MS16WT	(F) (Note 1)	00045424		ØRLSG	(H)	130	16
MS2LT	(F) (Note 1)	00045441		*ØRSCAN__	(F) (Note 2)	077	—
MS2T	(F) (Note 1)	00045401		PG	(H)	031	14
MS2WLT	(F) (Note 1)	00045461		PGG	(H)	131	14
MS2WT	(F) (Note 1)	00045421		PGS	(H)	030	14
MS4LT	(F) (Note 1)	00045442		PGSG	(H)	130	14
MS4T	(F) (Note 1)	00045440		PL	(H)	031	12
MS4WLT	(F) (Note 1)	00045462		PLC	(H)	031	05
MS4WT	(F) (Note 1)	00045422		PLCG	(H)	131	05
MS8LT	(F) (Note 1)	00045443		PLCS	(H)	030	05
MS8T	(F) (Note 1)	00045403		PLCSG	(H)	130	05
MS8WLT	(F) (Note 1)	00045463		PLG	(H)	131	12
MS8WT	(F) (Note 1)	00045423		PLS	(H)	030	12
MXPDØ	(F) (Note 1)	02074640		PLSG	(H)	130	12
M0T	(H)	035	00	RDA	(H)	032	04
M1T	(H)	035	01	RDA+1	(H)	032	05
M2T	(H)	035	02	RDA+4	(H)	032	06
M3T	(H)	035	03	RDA+8	(H)	032	07
M4T	(H)	035	04	*RDAA__	(H)	014	—
M5T	(H)	035	05	RDA0	(H)	032	00
M6T	(H)	035	06	RDA1	(H)	032	01
M7T	(H)	035	07	RDA2	(H)	032	02
NØP	(H)	001	03	RDA3	(H)	032	03
ØGC	(H)	031	13	RDC	(H)	032	14
ØGCG	(H)	131	13	RDC+1	(H)	032	15
ØGCS	(H)	030	13	RDC+4	(H)	032	16
ØGCSG	(H)	130	13	RDC+8	(H)	032	17
ØLC	(H)	031	15	*RDCA__	(H)	017	—
ØLCG	(H)	131	15	RDC0	(H)	032	10
ØLCS	(H)	030	15	RDC1	(H)	032	11
ØLCSG	(H)	130	15	RDC2	(H)	032	12

2B INSTRUCTION SET (Cont)

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL	INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
RDC3	(H)	032	13	*TCSL__	(F) (Note 2)	100	—
*RDSAA__	(F)	157	—	TCXGR	(H)	125	15
RDSCA__	(F)	175	—	TDA	(H)	135	02
RED__	(F)	075	—	TGR__	(H)	020	—
RFXAA	(H)	033	04	TIX__	(H)	054	—
RFXGR	(H)	033	05	TLR__	(H)	120	—
RGL0	(H)	033	13	TR (Note 5)	(H)	06x	—
RGR__	(H)	023	—	TRA__	(F)(Note 4)	14x	—
RLR1	(H)	033	06	TSA__	(F)(Note 4)	04x	—
RLR2	(H)	033	07	TTSA	(H)	135	00
RLR4	(H)	033	10	VA	(H)	026	04
RTCXGR	(H)	125	15	VA+1	(H)	026	05
*SAAN__	(H)	126	—	VA+4	(H)	026	06
*SAA2	(H)	126	02	VA+8	(H)	026	07
*SCAN__	(H)	132	—	*VAA__	(H)	037	—
SCA2	(H)	132	02	VA0	(H)	026	00
SCF	(H)	033	12	VA1	(H)	026	01
SGL	(H)	116	11	VA2	(H)	026	02
SGRF	(H)	116	04	VA3	(H)	026	03
SM0	(H)	036	00	VC	(H)	026	14
SM1	(H)	036	01	VC+1	(H)	026	15
SM2	(H)	036	02	VC+4	(H)	026	16
SM3	(H)	036	03	VC+8	(H)	026	17
SM4	(H)	036	04	*VCA__	(H)	137	—
SM5	(H)	036	05	VC0	(H)	026	10
SM6	(H)	036	06	VC1	(H)	026	11
SM7	(H)	036	07	VC2	(H)	026	12
*SØP	(F) (Note 1)	00006401		VC3	(H)	026	13
SW	(H)	031	17	*WØPS	(F) (Note 1)	03074004	
SWG	(H)	131	17	*WPS	(F) (Note 1)	03074010	
SWS	(H)	030	17	WRA (L)	(H)	034	04
SWSG	(H)	130	17	WRA (R)	(H)	134	04
SXPDØ	(F) (Note 1)	002074740		WRA+1 (L)	(H)	034	05
SXPDØV	(F) (Note 1)	002074741		WRA+1 (R)	(H)	134	05
TBXGR	(H)	033	17	WRA+4 (L)	(H)	034	06
TCNS (Note 5)	(H)	07x	—	WRA+4 (R)	(H)	134	06
*TCNSL__	(F) (Note 2)	160	—	WRA+8 (L)	(H)	034	07
TCS (Note 5)	(H)	06x	—	WRA+8 (R)	(H)	134	07

2B INSTRUCTION SET (Cont)

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL	INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
*WRAA__	(H)	114	—	XTCLR	(F) (Note 1)	00074524	
WRA0 (L)	(H)	034	00	XTPDØ	(F) (Note 1)	02074540	
WRA0 (R)	(H)	134	00	XTPDØMB	(F) (Note 1)	02074561	
WRA1 (L)	(H)	034	01	XTPDØV	(F) (Note 1)	02074500	
WRA1 (R)	(H)	134	01	XTPUB	(F) (Note 1)	02074620	
WRA2 (L)	(H)	034	02	XTPUBV	(F) (Note 1)	02074420	
WRA2 (R)	(H)	134	02	XTSC+1	(F) (Note 1)	02074441	
WRA3 (L)	(H)	034	03	XTSC+2	(F) (Note 1)	02074442	
WRA3 (R)	(H)	134	03	XTSC+4	(F) (Note 1)	02074444	
WRC (L)	(H)	034	14	XTSCØ	(F) (Note 1)	02074440	
WRC (R)	(H)	134	14	ZAA	(H)	115	00
WRC+1 (L)	(H)	034	15	*ZAAN__	(H)	127	—
WRC+1 (R)	(H)	134	15	ZAA2	(H)	127	02
WRC+4 (L)	(H)	034	16	ZCA	(H)	115	01
WRC+4 (R)	(H)	134	16	*ZCAN__	(H)	133	—
WRC+8 (L)	(H)	034	17	ZCA2	(H)	133	02
WRC+8 (R)	(H)	134	17	ZCF	(H)	001	02
*WRCA__	(H)	117	—	ZGL	(H)	116	12
WRC0 (L)	(H)	034	10	ZGR	(H)	115	03
WRC0 (R)	(H)	134	10	ZGRF	(H)	116	05
WRC1 (L)	(H)	034	11	ZKR	(H)	115	04
WRC1 (R)	(H)	134	11	ZLR	(H)	115	05
WRC2 (L)	(H)	034	12	ZLW	(H)	115	06
WRC2 (R)	(H)	134	12	ZMC	(H)	115	07
WRC3 (L)	(H)	034	13	ZM0	(H)	136	00
WRC3 (R)	(H)	134	13	ZM1	(H)	136	01
WRI__	(F)	076	—	ZM2	(H)	136	02
*WRSAA__	(F) (Note 2)	156	—	ZM3	(H)	136	03
WRCSA__	(F) (Note 2)	176	—	ZM4	(H)	136	04
WZT	(H)	002	02	ZM5	(H)	136	05
XØR	(H)	031	06	ZM6	(H)	136	06
XØRG	(H)	131	06	ZM7	(H)	136	07
XØRS	(H)	030	06	*ZØP	(F) (Note 1)	00006400	
XØRSG	(H)	130	06	ZPFM	(H)	115	02
XSC11T	(F) (Note 1)	00675401		ZRF	(H)	116	13
XSC22T	(F) (Note 1)	00675421		ZW	(H)	031	00
XSV11T	(F) (Note 1)	00475001		ZWG	(H)	131	00
XSV22T	(F) (Note 1)	00475022		ZWS	(H)	030	00
XTCLF	(F) (Note 1)	00074525		ZWSG	(H)	130	00

2B INSTRUCTION SET (Cont)

INSTRUCTION	WORD LENGTH	OP CODE OCTAL 7 BITS	DATA FIELD OCTAL
4ZT	(H)	002	04
41ST	(H)	002	06

UNIQUE 2B INSTRUCTIONS AND NO. 2B EMULATED INSTRUCTIONS FORMAT
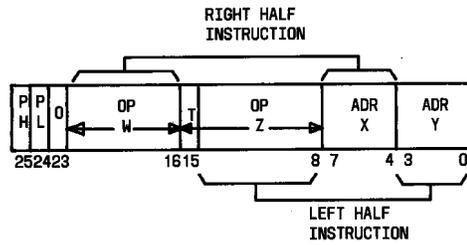
2B HALF WORD INSTRUCTION
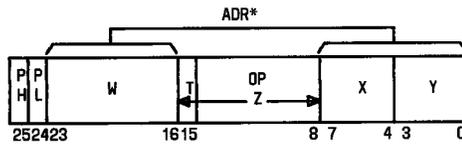
* READ ADDRESS AS WYX.

2B FULL WORD INSTRUCTION

2B INSTRUCTION SET (Cont)

General Notes:

Note 1: These full words have no variable fields. Actual stored octal contents are shown (bits 0-23). Insert TA if required.

Note 2: These full words have a 7-bit OP code (Z) and a 16-bit data field (WXY).

Note 3: There are four types of FIL instructions, since the field is 4 bits. The 5th and 6th bits are carried in the OP code, resulting in two different instructions.

Note 4: TRA and TSA instructions have a range for 19-bit addresses for No. 2B ESS. OP code picks up the three bits of the address (bits 16-18). This results in eight different OP codes for the TRA and TSA instructions.

Note 5: TR, TCNS and TCS have a 4-bit field. The transfer field is actually 6 bits. The 5th and 6th bits are carried in the OP code. The 6th bit of the OP code determines if transfer is forward or backward. As a result, four different OP codes may be generated

<div align="center">

For example: 7-bit OP code   4-bit field

X X X X X X X   X X X X

0 or 1 for 5-bit field (range of 32 addresses)

0 = transfer forward

1 = transfer backward

</div>

Note 6: Bit 15 is a TA (transfer allowable) bit. TA must be inserted as required.

Note 7: For half words, W and Z are 7-bit OP codes.

      A. For example, WX: W is a 7-bit OP code and X is a 4-bit field.

Note 8: For half words, bit 23 must be 0.

Note 9: (L) denotes left half word and (R) denotes right half word. Certain half word commands are marked XXXX (L) or XXXX (R) and have different OP codes depending on whether the word is in left or right half.

* - Indicates 2B extended OP codes.

TTY RESPONSES	
?A	Error in action field
?C	Wrong TTY channel
?D	Error in data field
?E	Inconsistency in format
?F	Format error
?I	Error in identification field
?O	TTY channel out of service (hit break key)
?P	TTY parity error
?T	Timeout
?X	Channel in paper tape mode
??	System reinitialized during message
#	TTY buffer is currently full
IP	In progress
NA	No acknowledgment, control of message has been lost and correct acknowledgment is not possible
NB	The entire 2B buffer is full
NG	No good
OK	Message accepted and acted upon
PF	Printout follows
RL	Repeat later

INPUT MESSAGE OPTION CHARACTERS — FORMAT A MESSAGES

First word of the message is of the form X_1 X_2 X_3 X_4 where:

X_1 = Type of message (A, M, T, U)
    A — ADMINISTRATION
    M — MAINTENANCE
    T — TRAFFIC
    U — UTILITY

X_2 = PRIORITY (B, I, H, P, Q, blank)
    B — BASE LEVEL
    I — INTERRUPT LEVEL
    H — HIGH PRIORITY
    P — MEDIUM PRIORITY
    Q — LOW PRIORITY
    blank — DEFAULT (no priority)

X_3 = EXECUTION (R, S, blank)
    R — REPETITIVELY EXECUTE
    S — STEP (repeat on signal)
    blank — EXECUTE ONE TIME

X_4 = OUTPUT (L, blank)
    L — RESULTS IN PASS/FAIL LIGHTS
    blank — OUTPUT ON TTY

PASS/FAIL LIGHT MEANINGS

When using X_3 and/or X_4 with control unit diagnostics:

X_3 X_4	PASS LIT	FAIL LIT	BOTH LIT	TTY
R				FIRST FAILURE PRINTOUT FIRST PASSING PRINTOUT
S	TEST PASSES	TEST FAILS	TEST FAILS DIFFERENTLY THAN FIRST FAILURE	FAILURES DIFFERENT FROM FIRST FAILURE (UP TO 15) PRINTOUT(S)
RL				
SL				FIRST FAILURE PRINTOUT

When using X_3 EQUAL TO R WITH PERIPHERAL UNIT ORDERS:

MR DC ORD
    PASS lit if no IO error.
    PASS lit if K = 4 or 5.
    FAIL lit if IO error.
    PASS AND FAIL both lit if test fails differently than the first failure.

INPUT MESSAGE OPTION CHARACTERS — FORMAT A MESSAGES (Cont)

MR DS ORD
 	
   PASS lit if uuuuuu field of output message MR DS ORD is zero.
   FAIL lit if uuuuuu field of output message MR DS ORD is not zero.

MR LS ORD
 	
   $j = 0, 1$ $\begin{cases} \text{PASS lit if no CPD, EV, or ASW error.} \\ \text{FAIL lit if CPD, EV, or ASW error.} \end{cases}$
 	
   $j = 2$ $\begin{cases} \text{PASS lit if no CPD or EV error.} \\ \text{FAIL lit if CPD or EV error.} \end{cases}$
 	
   $j = 3$ $\begin{cases} \text{PASS lit if no column fault.} \\ \text{FAIL lit if column fault.} \end{cases}$

MR MS ORD — Same as MR LS ORD

MR NW ORD
 	
   PASS lit if no CPD or EV error.
   FAIL lit if CPD or EV error.

MR US ORD — Same as MR LS ORD

INPUT MESSAGE OPTIONS — FORMAT B MESSAGES

First word of the message is the ACTION field where:

ONC = On condition. Applies to LOAD (LOD), DUMP (DMP), and MONITOR (MON)

RPT = Repeat action. Applies to DIAGNOSE (DGN), LOD, and MON

RDT = Results directed to specified unit(s). Applies to LOD and MON

SGL = Single action. Applies to DGN, LOD, and MON

STEP = Step action for each operation of remote execute button. Applies to DGN

UCL = Unconditional execution regardless of system defenses. Applies to DGN, RESTORE (RST), and SWITCH (SW)

OUTPUT MESSAGE OP POSTMORT FORMAT

LINE	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6	COLUMN 7	COLUMN 8
1	Note 1	APPL. BITS	SYSTATE (Note 2)	Note 3	T1	IS	PA (19-16)	PA (15-0)
2	R8'	R9 (Note 4)	R10 (Note 4)	R11	(SPARE)	IM	DB (19-16)	DB (15-0)
3	R12	R13	R14	R15	HG	(SPARE)	SS (19-16)	SS (15-0)
4	HG(0)*	HG(1)	HG(0)+16	HG(1)+16	HG(0)+32	HG(1)+32	ER (19-16)	ER (15-0)

Note 1: Bits 2-0 contain the initialization level number, bit 3 contains a flag indicating the level number reached its maximum value and recycled before the system left the initialization state. Bits 9-4 contain the seconds past the last minute. Bits 15-10 contain the last hour.

Note 2: See Page 67 for SYSTATE definition.

Note 3: Initialization data —

BIT NO.	DEFINITION
0	If 1, no switch occurred
1	Cause of initialization was a MCH message
2, 3	01 — Cause of initialization was first timeout
	11 — Cause of initialization was second timeout
4	CU was locked or forced on-line
5	If 1, initialization started by reloading memory from tape
6	The main store was out-of-date
7	No access exists to the other main store
8	0 — CU0 is initializing
	1 — CU1 is initializing
9	If 1, the maintenance channel failed while the off-line registers were being retrieved for the post-mortem dump.
14	System status panel memory reload request
15	System status panel initialization request

Note 4: If there is no switch, contents is meaningless.

* HG(0) is the contents of word 0 of the HG slot pointed to by HG (Line 3, Column 5).

PERIPHERAL UNIT TROUBLE RECOVERY

One or more of the following printouts may be received as a result of the Peripheral Order Buffer Maintenance (POBM) program.

> MI NW ERR fg hi mmmc eeeeee nopqrs tuvwxy
> MA NW RMV fg hi mmmc eeeeee nopqrs tuvwxy
> MI CU ACC i nw fg c
> MI NW ADR fg hi mmmc eeeeee nopqrs tuvwxy
> MI NW MAT fg hi mmmc eeeeee nopqrs tuvwxy

When a PU order fails due to a network controller enable verify failure lockup, network fabric false cross or ground (FCG), power cross, or access trouble, the POBM program is called in to carry out corrective action. The actions taken by the POBM program can best be described by the flow chart on page 34.

The state of the system affects the POBM program and gives different meanings to the printouts received. The sequence of events in the flow chart is true only when all involved pieces of equipment are in service. A recovery step will be skipped if the required equipment is out-of-service.

The craftsman must analyze the printouts to determine the conditions that existed at the time of the original peripheral order failure. The exact trouble recovery steps can be determined by associating the printouts with the PU trouble recovery flow chart.

The trouble recovery steps illustrated by the flow chart are as follows:

(1) The same CU and LTN controller are retried using the failing network order (specifying the failing LTN path). If this retry is successful, the original failure is considered transient and the following TTY message is printed out:

MI NW ERR

(2) If the retry in (1) is unsuccessful, the failing order will be repeated using the mate controller. If this retry is successful, the original controller is removed from service and specified in the following TTY printout:

MA NW RMV

(3) If retry in (2) is unsuccessful, a sync switch will be performed and the failing order will be repeated using the on-line CU. If this retry is successful, the trouble is considered CU-oriented, the off-line CU is removed from service, and the following TTY message is printed out:

MA CU RMV

(4) If the original order is still failing after the above retries and equipment configurations, the POBM assumes that the trouble is network path-oriented. The path information is sent to the ERANL program, and all of the failing POB information is specified in the following TTY printout:

MI NW ADR

(5) If the mate controller was executing an order during the original POB cycle the following TTY message is printed out:

MI NW MAT

POBM TROUBLE RECOVERY

```
            ┌──────────────┐
            │ ORIGINAL     │
            │ PERIPHERAL   │
            │ ORDER (PO)   │
            │ FAILS        │
            └──────┬───────┘
                   │
            ┌──────┴───────┐
            │ CALL PU      │
            │ TROUBLE      │
            │ RECOVERY     │
            │ PROGRAM      │
            └──────┬───────┘
     (1)           │
            ┌──────┴───────┐
            │  RETRY PO    │
            └──────┬───────┘
                   │
                  ╱ ╲         PASS   ┌──────────────┐
                 ╱ PO╲───────────────│ LOAD MI      │
                 ╲RESULTS╱           │ NW ERR       │
                  ╲ ╱                │ PRINTOUT     │
     (2)         FAIL│               └──────┬───────┘
            ┌──────┴───────┐
            │ RETRY PO USING│
            │ MATE CONTROLLER│
            │ TO SEND ORDER │
            │ THAT FAILED   │
            └──────┬───────┘
                   │                         WAS
                  ╱ ╲      PASS ┌──────────────┐   ╱MATE CONT.╲   NO
                 ╱ PO╲──────────│ REMOVE ORIGINAL│ ╱SENDING ORDER╲────┐
                 ╲RESULTS╱      │ CONTROLLER AND │ ╲DURING THE  ╱     │
                  ╲ ╱           │ LOAD MA NW RMV │  ╲ORIG. PO ╱       │
     (3)         FAIL│          │ PRINTOUT       │   ╲  ╱             │
            ┌──────┴───┐       └────────────────┘   YES              │
            │ SWITCH CUS│                       (5)  │               │
            └──────┬───┘                       ┌─────┴──────┐        │
            ┌──────┴───────┐                   │ LOAD MI    │        │
            │ RETRY PO USING│                  │ NW MAT     │        │
            │ ORIGINAL      │                  │ PRINTOUT   │        │
            │ CONTROLLER AND│                  └─────┬──────┘        │
            │ OTHER CU      │                        │◄──────────────┘
            └──────┬───────┘                       ╱   ╲
                   │                              │  GO  │
                  ╱ ╲      PASS ┌──────────────┐  │PRINTOUT│
                 ╱ PO╲──────────│ REMOVE ORIGINAL│ ╲     ╱
                 ╲RESULTS╱      │ CU AND LOAD   │   ╲ ╱
                  ╲ ╱           │  MA CU RMV    │
     (4)         FAIL│          │  MI CU ACC    │
            ┌──────┴───────┐    │ PRINTOUTS     │
            │ LOAD MI      │    └───────────────┘
            │ NW ADR       │
            │ PRINTOUT     │
            └──────────────┘
```

VERIFICATION OF SCAN ANSWER (AN) BUS

This verification is accomplished by observing ferrod changes, via a scan row display at the DB, for trunk test panel (TTP) scan points.

(1)   Display ferrod row 59 in scanner 1 (MON:TSSN 0159; RDT LAMPS!). All ferrods should be unsaturated (lights on) with the TTP idle.

(2)   Using the following list, verify that SAB bits 0-13 operate correctly by operating the indicated TTP keys.
Operation of the MON, XMSN, VM or IC key associated with the access trunks will saturate ferrods which then remain saturated due to circuit state change. Operating the corresponding RLS key will reset the circuit, unsaturating the ferrod. The other keys listed cause ferrod saturation only when depressed.

BIT POSITION	TTP KEY
0	RLS(1)
1	MON(1)
2	XMSN(1)
3	AT1
4	VM(1)
5	RLS(2)
6	MON(2)
7	XMSN(2)
8	AT2
9	VM(2)
10	RLS(3)
11	MON(3)
12	IC
13	AT(3)

(3)   To check AN bus bits 14 and 15, change the display to row 60 and observe bits 14 and 15 as the PD group switch position is varied. The correct states are given in the following list.

PD GRP SWITCH POSITION	BIT 14	(0-SATURATED) 15
0-5	0	0
6-11	1	0
12-17	0	1
18-23	1	1

3A CC REGISTERS

Store Address Register (SAR)

19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

SELECTION
OF MAIN
STORE
(0-3)

ONE OF
8 MODS
(0-7)

ROW AND COLUMN
TO BE ACCESSED

ONE OF
8 CHIPS
(0-7)
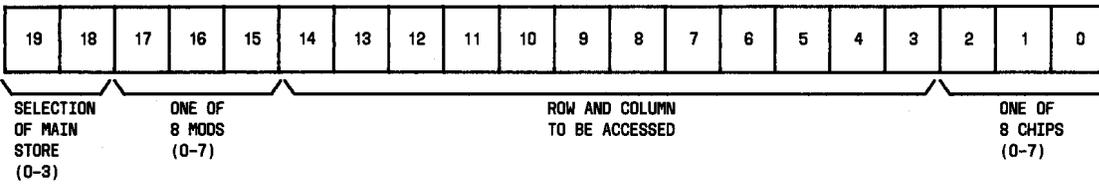
3A CC REGISTERS (Cont)

Function of Microcontrol Status Register Bits

BIT	DESIGNATION	FUNCTION
0	Condition Flip-Flop (CF)	Used as branch condition for microprogram control. Duplicate bits are used for setting the MAR low order bit and complementing the parity bit so that a stuck-at-zero (S-A-0) or S-A-1 failure of either duplicate bit will result in bad parity on the MAR.
1	CF (duplicate)	
2	Data Manipulation Logic Status (DS)	
3	DS (duplicate)	
4	Test Register 1 (TR1)	
5	TR1 (duplicate)	
6	Test Register 2 (TR2)	
7	TR2 (duplicate)	
8	Data Ready (DR)	Used to indicate that the last main memory operation has been completed. DR bit is set by a combination of store completion signals from both stores and reset by any signal which initiates a main memory operation. One copy controls gating of the new operation code into MAR and other controls same gating into RAR. Any failure of one of the copies of the DR bit will be detected by MAR-RAR mismatch.
9	DR (duplicate)	
10	RAR Update (RU)	Controls function of RAR. When RU=1, RAR is used as a duplicate of the MAR to check gating into it from MIR and micro-store. When RU=0, RAR is used to save a return address which will subsequently be branched to, e.g., return from a sub-routine. RU is set by same control signal that gates out of RAR and reset by a miscellaneous decoder crosspoint.
11	RU (duplicate)	
12	I Flip-Flop (IFF)	Determines from which SIR the new OP code is derived (SIR0 for the low 16-bits of memory and SIR1 for the upper bits of memory field).
13	IFF (duplicate)	
14	OP Code Fil (OPF)	Used when expanding the number of operation codes from 128 to 256. If OPF bit=0, then the 7 bit OP field maps into a block of 128 OP codes starting at micro-store address 256. If OPF bit=1, then the OP code field maps into a block of an additional 128 OP codes starting at 2048.
15	OPF (duplicate)	
16	MARP	Used for internal check function. In general, reflects the parity of the MAR. MARP is not duplicated but appears twice to preserve MCS register parity.
17	MARP	
18	Error Return Address Update (ERU)	Controls function of ERAR. When ERU=0, the NA field coming from micro-store is gated to ERAR. ERU is not duplicated but appears twice to preserve MCS register parity.
19	ERU	

3A CC REGISTERS (Cont)

Designations and Functions of Main Memory Status Register Bits

BIT	DESIGNATION	FUNCTION
0	Memory Maintenance (MM) 1	Used with MM2 and RW to formulate the command sent in a memory operation
1	MM1	Same as bit 0
2	MM2	Used with MM1 and RW to formulate the command sent in a memory operation
3	MM2	Same as bit 2
4	Read or Write (RW)	Indicates whether memory is to perform a read (1) or write (0) operation
5	RW	Same as bit 4
6	Idle (IDL)	If set, disables all communications to the other 3A CCs memory
7	IDL	Complement of bit 6. If set, disables all communications from other 3A CCs memory
8	Update (UPD)	Indicates whether or not to update the off-line memory
9	UPD	Same as bit 8
10	Isolate (ISO)	Prevents the other 3A CC from accessing this 3A CCs memory
11	ISO	Same as bit 10
12	Block Double Store Read (BDSR)	Inhibits double store read
13	BDSR	Same as bit 12
14	Complement Write (CW)	Activates complement write lead of main store bus. Main store controller (MASC) will have last word, write complement of last word, and store in the complement in the last read address
15	Block Error Recovery (BEC)	Inhibits all error recovery procedures within the 3A CC associated with incorrect store read data.
16	CW	Same as bit 14
17	BEC	Same as bit 15

3A CC REGISTERS (Cont)

Defined Levels and Bit Locations in the Interrupt Set Register

IS BIT	FUNCTION
3	Address or Data Match
5	Error Register (Interrupt Class)
7	Other CC (External)
8	5 ms Interrupt
9	25 ms Interrupt
13	3A CC Control Panel Execute

3A CC REGISTERS (Cont)

Indications of Error Register

BITS	DESIGNATION			
0	TO Decoder Error			
1	FROM Decoder Error			
2	IB X, Y Field Error			
3	Bus Parity Error	SWITCH ERRORS		
4	DML Mismatch			
5	MAR Parity Error			
6	Clock Error			
7	*My* Store Error			
8	MAR-RAR Mismatch			
9	Function Register Parity Error			
10	Store Read Parity Error		ERROR CORRECTION	
11	*My* Store Write Protect			
12	*My* Store Fast Time-out			INITIALIZATION ERRORS
13	Branch Allowed Error			
14	*Other* Store Write Protect			
15	*Other* Store Error			
16	*Other* Store Fast Time-out			
17	I/O Multiple Channel Select	INTERRUPT ERRORS		
18	PT Reset Received By On-line 3A CC			
19	Switch Received By On-line 3A CC			
20	I/O Channel Error			
21	I/O Bad Parity Received			

3A CC REGISTERS (Cont)

Designations and Functions of Bits in System Status Register

BIT	DESIGNATION	FUNCTION
0	Address Match Enable (AME)	Enables the match between SAR and the address input register.
1	Block Hardware Check (BHC)	Disables the output of the error register (bits 0 through 13).
2	Block Interrupt (BIN)	Disables all interrupts.
3	Block Timer Check (BTC)	Blocks the input and output from the program timer.
4	Data Match Enable (DME)	Enables the match between store data bus and the data input register.
5	Halt (HLT)	Drives the control panel lamp which indicates the 3A CC is in a program halt condition.
6	Initialization Sanity Check 1 (ISC1)	Checks sanity of hardware initialization routine. If a failure is detected, a switch to the other 3A CC will occur.
7	Initialization Sanity Check 2 (ISC2)	Checks sanity of hardware initialization routine. If a failure is detected, the main memory will be reloaded if ICS1=1 also.
8	Lock Off-Line (LOF)	Disables the I/O channels to prevent interference with on-line 3A CC. Allows processor power to be removed via the control panel power key.
9	Lock On-Line (LON)	Forces all hardware switch messages to initialize this 3A CC and keep it on-line.
10	Manual (MAN)	Drives the manual lamp on the control panel which indicates 3A CC (off-line) is in manual mode.
11	Microinterpret Mode (MINT)	Blocks the gating from the microstore into MIR. Enables the gating from main memory into the MIR.
12	Control (CC)	Indicates whether this 3A CC is on-line (CC=1) or off-line (CC=0) and controls various functions which protect on-line 3A CC from the off-line 3A CC.
13	Reject (REJ)	Drives the control panel lamp which indicates that a panel operation was not performed.
14	Stop (STP)	Jams the MAR to a maintenance address causing all zeros to be read out of microstore.
15	Disable	Disables the I/O channels to prevent interference with on-line 3A CC.
16	PRIVILEGE (PRI)	Used for certain applications of the 3A CC that require a privilege mode for instruction execution.
17	Display (DISP)	Disables the gating from the PA to the display buffer on all transfers.
18	Block Bus Parity Check (BPC)	Disables the data bus parity checker.

3A CC REGISTERS (Cont)

Designations and Functions of Bits in System Status Register

BIT	DESIGNATION	FUNCTION
19	Initiate Program Reload Track (IPLTRK)	Used by the microcode within the sequence which initiates program reloads (IPL) from tape. The state of this bit determines which of the two identical tracks on the tape cartridge to read. This bit is also used to determine when to perform the more drastic initialization of the main store prior to reading data off the tape.
20	Central Control 0 (CC 0)	Always 1 in 3A CC 0 so that program knows which 3A CC it is running in.
21	CC 1	Always 1 in 3A CC 1 so that program knows which 3A CC it is running in.

3A CC REGISTERS (Cont)

Function of Maintenance State Register Bits

BIT	FUNCTION
0	Override LOF
1, 2, 3	Test conditions for clock
4	Ground my store GO lead
5	Ground bus busy lead
6	Utility freeze
7	Ground *my* store complete lead
8	Ground *other* store complete lead
9	Enable IB (X, Y) to MIR when stopped and partially inhibit the FROM check
10	Enable RAR-MAR match independent of RU flip-flop
11	Hold MAR parity and disable miscellaneous decoders on board MC4
12	Disable miscellaneous decoders on board MC4
13	Code Merger Test 1
14	Code Merger Test 2
15	Jam store control lead 3=1

SYSTEM STATUS PANEL MAP — BIT DEFINITIONS

SSPMAP+0

BIT NUMBER	DEFINITION
0	— ENABI — ENABLE key active
1	— LOCKP — Lock key is active (allows program access to CU(0), CU(1), and FORCE)
2	— CU0 — CU(0) select for force or lock
3	— CU1 — CU(1) select for force or lock
4	— TTY1 — TTY INITialization key active
5	— PFE — Pass Fail Execute key (step or repetitive MSF active)
6	— RELOAD — MEMORY RELOAD key active
7	— Not used
8	— LOCKUP — LOCK key on SSP is active
9	— FORCE — FORCE key active
10	— FAIL — Step or repetitive test failing or changing results
11	— PASS — Step or repetitive test ATP or changing results
12	— DISREM — DISABLE REMOTE ACCESS key active
13	— ALTBUS — ALTERNATE BUS key active
14	— SERVL — SERVICE LOSS (initialization) has occurred
15	— EXINT — EXECUTE key active

SSPMAP+1

BIT NUMBER	DEFINITION
0	— CRITA — Critical alarm relay active
1	— PANEL — PANEL timeout has occurred
2	— BATRY — Alarm circuit alarm relay circuit
3	— MJPOW — Major power alarm relay active
4	— MIPOW — Minor power alarm relay active
5	— MIALM — Minor alarm relay active
6	— MJALM — Major alarm relay active
7	— CTALM — CRITICAL alarm
8	— EMLXF — EMERGENCY LINE TRANSFER key active
9	— Not used
10	— IHALM — INHIBIT BUILDING ALARM key active
11	— ALMXF — ALARM TRANSFER function active
12	— ARMRL — ALARM RELEASE — a manual resetable alarm exists
13	— STABI — STABLE CALLS key active
14	— RECTI — RECENT CHANGE key active
15	— BCKDT — BACKDATE OFFICE DATA key active

SYSTEM STATUS PANEL MAP — BIT DEFINITIONS (Cont)

SSPMAP+2

BIT NUMBER	DEFINITION
0	— CU0A — CU(0) is in the ACTIVE state
1	— CU0SB — CU(0) is in the STANDBY state
2	— CU0OS — CU(0) is OUT OF SERVICE
3	— CU0UA — CU(0) is UNAVAILABLE
4	— CU1A — CU(1) is in the ACTIVE state
5	— CU1SB — CU(1) is in the STANDBY state
6	— CU1OS — CU(1) is OUT OF SERVICE
7	— CU1UA — CU(1) is UNAVAILABLE
8	— CBLDG (SCC) — Building alarm (ALARM CIRCUIT|BUILDING|MAJOR POWER|MINOR POWER
9	— CCU (SCC) — CU status is not ACTIVE+STANDBY
10	— CNET (SCC) — Network trouble
11	— CMAS (SCC) — Main store trouble
12	— CMISC (SCC) — Miscellaneous trouble (MISC|RA|RT)
13	— CFORCE (SCC) — Forced condition exists (ATI|MANUAL FORCED)
14	— CTRAF (SCC) — Traffic trouble
15	— CSYNOR (SCC) — System normal (not implemented)

SSPMAP+3

BIT NUMBER	DEFINITION
0	— MISC — MISCellaneous trouble
1	— RA — Recorded Announcement frame trouble
2	— RT — Ringing and Tone frame trouble
3	— AMA — Automatic Message Accounting frame trouble
4	— SCAN — SCANner trouble
5	— NET — NETwork trouble
6	— MAS — MAin Store trouble
7	— ATI — Automatic Test Inhibit active
8	— CRINM — SYSTEM NORMAL — (IHALM, CTALM, MJALM, MIALM, PANEL, CRITA, CTRAF, CFORCE, CMISC, CMAS, CNET, CCU, CBLDG, FUSEA, MAJOR, MINOR, SCAN, AMA, CKTLM, CRINM)
9	— MAGEQ — MAJOR Equipment LOSS (MAS|NET|SCAN|AMA|RT|RA|MISC)
10	— BATT — ALARM CIRCUIT alarm
11	— PWMAJ — MAJOR POWER alarm
12	— PWMIN — MINOR POWER alarm
13	— MINOR — MINOR alarm
14	— MAJOR — MAJOR alarm
15	— FUSEA — FUSE alarm

SYSTEM STATUS PANEL MAP — BIT DEFINITIONS (Cont)

SSPMAP+4

BIT NUMBER	DEFINITION
0	— TOLNW — TOLL NETwork protection active
1	— DSP — Dynamic Service Protection active
2	— TRAFIC — TRAFFIC trouble
3	— MANFC — MANUAL FORCED state exists
4	— TAPEB — Tape Data Controller trouble
5	— CKTLM — CircuiT LIMit (trunk or service circuit) trouble
6	— BLDG — BuiLDinG alarm exists
7	— TTY — Maintenance channel TeleTYpewriter controller trouble
8	— DB00 — Display buffer
•	•
•	•
•	•
15	— DB07

SSPMAP+5

BIT NUMBER	DEFINITION
0	— DB08 — Display buffer
•	•
•	•
•	•
15	— DB23

CALL REGISTER FORMATS

ORIGINATING REGISTER (OR)
2B − EF-1 GENERIC

T Ø N	Ø P S	C N T	SCAN POINT NUMBER			
			SCANNER	SCANNER ROW		FERROD
INCOMING DIGIT AREA				OUTGOING PULSE COUNT	S P R	M B S	S N D	N D G
			DP COUNT					
D T A	S D T	NOT USED		S A S	T D B	R P T	L S B	NO MON	BYL TRK	INC TRK	SENDING FUNCTION
REC SUP	SND SUP	F A L	R D Y	STOP SENDING CODE	INCOMING DIGIT COUNT	OUTGOING DIGIT COUNT
DIGIT 0	DIGIT 1	DIGIT 2	DIGIT 3
DIGIT 4	DIGIT 5	DIGIT 6	DIGIT 7
DIGIT 8	DIGIT 9	DIGIT 10	DIGIT 11
DIGIT 12	DIGIT 13	DIGIT 14	DIGIT 15

LEGEND:
   BYL TRK – BYLINK TRUNK
   CNT – SCANNER CONTROLLER
   DTA – DIAL TONE ALLOWED
   FAL – FAILURE
   INC TRK – INCOMING TRUNK
   LSB – LINK SHARE BIT
   MBS – MAKE BREAK STATUS
   NDG – NEW DIGIT
   NO MON – NO MONITOR REPORT
   OPS – OUTPULSE SPEED (10 OR 20 PPS)
   REC SUP – RECEIVER SUPERVISION
   RDY – READY
   RPT – REPORT BIT FOR BYLINK TRUNK
   SAS – SUPPRESS ATTENDANT SUPERVISION
   SDT – SECOND DIAL TONE REQUIRED
   SND SUP – SEND SUPERVISION
   SPR – SIGNAL PRESENT ("TOUCH-TONE")
   TDB – TANDEM DIALING BIT
   TON – TONE (RECEIVER)

CALL REGISTER FORMATS (CONT)

ORIGINATING REGISTER EXTENSION
2B — EF-1 GENERIC

15						0	
SENDER SPN							0
SENDER PD ADDRESS							
CHARGE INDEX 15 ... 9		MASK FLAG BIT 8	PAD SW BIT 7	6	SIMULATED TRUNK GROUP NO.	0	
TEMPORARY STORAGE (MULTI-SCAN)							
DIGIT 16	DIGIT 17		DIGIT 18		DIGIT 19		
DIGIT 20	DIGIT 21		DIGIT 22		DIGIT 23		
0 15	14				3	ATT CLG 2	THRU DIAL 1	ROTL 0
COMPRESSED BILLING NO., LINES TEN FOR CTX-CU FORMAT, TEN OF FORWARDED LINE FOR CHARGING CALL FORWARD LEG, OR ALL ZEROS							7

CALL REGISTER FORMATS (Cont)

Centrex Scatter Table Entry Formats

```
                                                          ESS BIT
   │15                                              0│    POS
   │ 1  │                   TEN                      │
WO │(15)│                  (14-0)                    │
   │────┴──────────────────────────────────────────┤
   │          SEE DESCRIPTIONS OF W1 STATES          │
W1 │                    (15-0)                        │
   │─────────────────────────────────────────────────│
```

```
W1 STATES

   │15                                              0│
   │ 0  │ 0  │           SPN/PSPN                    │  NO HELD CALL
   │(15)│(14)│            (13-0)                     │  OR CAMP-ON
```

```
W1 STATES (CONT)

   │15                                              0│  HAS HELD CALL
   │ 0  │ 1  │           SPN/PSPN                    │  OR IS CAMPED
   │(15)│(14)│            (13-0)                     │  ON OR CALL
                                                        RETRIEVED SIGNAL
```

```
   │15                                              0│
   │ 1  │ 1  │           SPN/PSPN                    │  MAY NOT BE
   │(15)│(14)│            (13-0)                     │  CAMPED ON
```
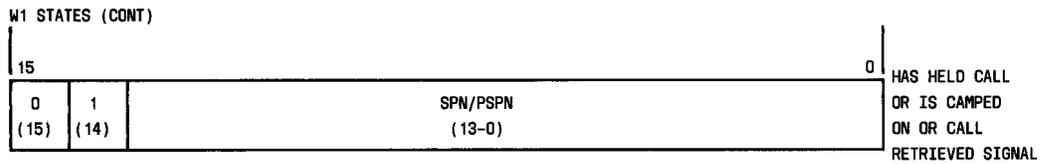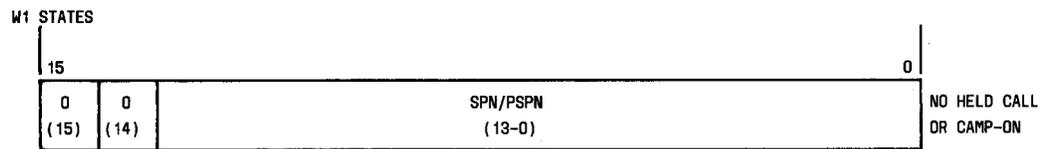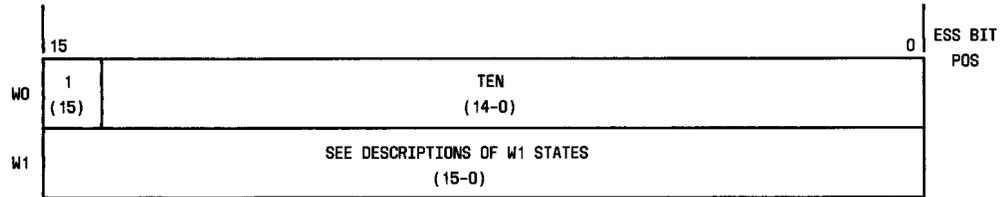
CALL REGISTER FORMATS (Cont)

Centrex Scatter Table Entry Formats

W1 STATES (CONT)

15							0	
1 (15)	0 (14)	0 (13)	0 (12)	0 (11)	0 (10)	CDPR NO. (9-0)		RETRIEVE STATE, OFF HK

15					0	
1 (15)	0 (14)	0 (13)	1 (12)	DON'T CARE (11-0)		RETRIEVE STATE, ON HK

W1 STATES (CONT)

15				0	NOT RETRIEVED OR
1 (15)	0 (14)	1 (13)	DON'T CARE (12-0)		RELEASE HOLD/ CAMP-ON *FOR POB FAILURE, W(0)=1000000000000000

	15		0	
WO	0 (15)	TEN OF FORWARDED LINE (14-0)		CALL FORWARD ENTRY
W1	0 (15)	TEN OF FORWARDED TO LINE (ALL ZERO IF FORWARDED TO ATT) (14-0)		

CALL REGISTER FORMATS (Cont)

STABLE TIMING ENTRY PARAMETERS

STETBL | 21   0 | ESS BIT POS

P (21)	'3' (20)	DUP (19)	⧸⧸	C. S. ADDRESS 0 OF STE BLOCK (15-0)
P (21)	0 (20)		⧸⧸	C. S. ADDRESS 1 OF STE BLOCK (15-0)
P (21)	0 (20)		⧸⧸	C. S. ADDRESS 2 OF STE BLOCK (15-0)
P (21)	0 (20)		⧸⧸	C. S. ADDRESS 3 OF STE BLOCK (15-0)

0	0	⧸⧸	ADR 0
0	1	⧸⧸	ADR 0
0	1	⧸⧸	ADR 0
0	1	⧸⧸	ADR 0

FOR 1 STE BLOCK

0	0	⧸⧸	ADR 0
0	0	⧸⧸	ADR 1
0	1	⧸⧸	ADR 0
0	1	⧸⧸	ADR 1

FOR 2 STE BLOCKS

1	0	⧸⧸	ADR 0
0	0	⧸⧸	ADR 1
0	0	⧸⧸	ADR 2
0	1	⧸⧸	ADR 0

FOR 3 STE BLOCKS

0	0	⧸⧸	ADR 0
0	0	⧸⧸	ADR 1
0	0	⧸⧸	ADR 2
0	0	⧸⧸	ADR 3

FOR 4 STE BLOCKS

THERE MAY EXIST A MAXIMUM OF FOUR STE BLOCKS. STETBL PROVIDES UP TO FOUR DIFFERENT ADDRESSES FOR PURPOSES OF RANDOM BLOCK SELECTION. THE FOLLOWING FIGURES SHOW THE ARRANGEMENT OF ADDRESS IN STETBL FOR 1, 2, 3 AND 4 STE BLOCKS (ADRn IS THE ADDRESS OF STE BLOCK n): (NOTE: ADDRESS OF STETBL MUST BE A MULTIPLE OF 4.)

NOTE: FOR 3 STE BLOCKS. BIT 20 OF THE FIRST WORD OF STETBL IS SET TO 1. ALSO, IN EACH CASE WHERE AN ADDRESS IS DUPLICATED, THE SECOND AND SUBSEQUENT APPEARANCES OF THAT ADDRESS ARE FLAGGED BY A 1 IN BIT 19.

CALL REGISTER FORMATS (Cont)

Terminal Memory Record (TMR)

TRANSIENT JUNCTOR TMR (bits 15 ... 0)

15						0
1		TCR POINTER			J	ST
		J	P_B	P_A		

TRANSIENT TRUNK OR SERVICE CKT TMR (bits 15 ... 0)

15												0
1		TCR POINTER								AB	ST	
		J	P_B	P_A	I_5	I_4	I_3	I_2	I_1	I_0	G_2	G_1 G_0

STABLE JUNCTOR TMR (bits 15 ... 0)

15															0
0	N_3'	N_2'	N_1'	N_0'	C_5'	C_4'	C_3'	C_2'	C_1'	C_0'	S_2'	S_1'	S_0'	L_1'	L_0'
STE	AMA	J	P_B	P_A	C_5	C_4	C_3	C_2	C_1	C_0	S_2	S_1	S_0	L_1	L_0

NOTE: PARTY IN FIRST WORD IS ASSOCIATED WITH EVEN JUNCTOR FERROD OR PLUG SIDE OF JUNCTOR.

STABLE TRUNK TMR (bits 15 ... 0)

15															0
0	N_3	N_2	N_1	N_0	C_5	C_4	C_3	C_2	C_1	C_0	S_2	S_1	S_0	L_1	L_0
STE	AMA	J	P_B	P_A	CLG	TDM	I_5	I_4	I_3	I_2	I_1	I_0	G_2	G_1	G_0

NOTE: IF TDM = 0, FIRST WORD OF TMR CONTAINS TEN OF LINE CONNECTED TO TRUNK. IF TDM = 1, FIRST WORD CONTAINS THE SPN/PSPN OF THE OTHER TRUNK.

Note: Refer to Legend on Page 53.

CALL REGISTER FORMATS (Cont)

Legend for Terminal Memory Records

AB — Bit used to indicate whether circuit is in use for "A" or "B" party. AB = 1 indicates the circuit is used for "A" party.

AMA — 1 = AMA disconnect entry is necessary

C_2C_0 — Connector (0-7)

C_2C_3 — Concentrator group (0-7)

CLG — Indicates whether circuit is calling or called party. 1 = circuit is calling party

G_2G_0 — Grid of path associated with smaller terminal equipment number

I_N — Index to junctor grouping table entry which defines junctor switch and level numbers and slip for wire junctor used for call

I_5I_0 — Increment into junctor subgroup table to determine switch, level, and slip of the wire junctor subgroup. Refer to PA-2H200 for junctor grouping table layouts.

J — Indicator of junctor appearance to which line, trunk, or service circuit is connected. J=0=calling party connected to plug end

L_1L_0 — Level (0-3)

N_3N_0 — Network number (0-14)

P_B,P_A — Indication of which 2 network paths is used to connect party to junctor terminal. P_B is used for the "B" party and P_A for the "A" party

ST — ST indicates which circuit is used as party or service circuit for supervision decoding purposes. 0 = party, 1 = service circuit.

STE — 1 = Stable timing list entry exists

S_2S_0 — Switch (0-7)

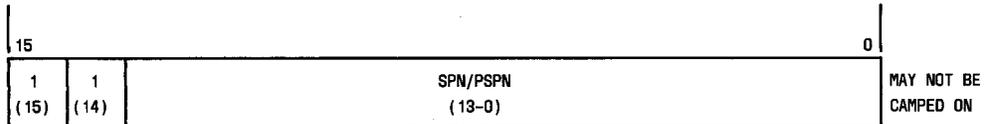TDM — Indicates that call is trunk to trunk. 1 = tandem. If TDM = 0, first word of TMR contains the TEN of line connected to trunk. If TDM = 1, word 0 contains the SPN/PSPN of the other trunk.

CALL REGISTER FORMATS (Cont)

Peripheral Unit and Local CPD Bad Address List (ACCESS)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
PU AND LOCAL CPD ENABLE ADDRESS										EEC				PBA	CUA	ACCESS+0
																ACCESS+1
																ACCESS+2
																ACCESS+3
																ACCESS+4
																ACCESS+5
																ACCESS+6
																ACCESS+7
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

Notes:

(1) EEC = excess error trouble recovery code.
 = 0001, try the mate controller next 'help' call.
 = 0011, try removing CU sync next 'help' call.
 = 0111, try switching the CUs next 'help' call.
 = 1111, excess permanent bad access; (no further excess error action).
 CUA = control unit having the bad access of interest.
 PBA = indicates if excess error trouble recovery for this entry is now in progress.
 = 0, action in progress.
 = 1, permanent bad access.

(2) The bad access list location (access) is defined with its low two bits equal to 00, and its length [ACCLENG = 8*E(8)] in program —LAYOUT—.

(3) The excess error trouble recovery program —PUETR— stops all actions when the list is full.

(4) Bad access entries are made by —PURCV— when a working configuration is found after a control unit switch, or if this trouble causes excess error trouble recovery action.

(5) PU bad access entries are cleared by restoring the control unit to service, local CPD entries are cleared by M DC: CLR: request. Nonexcess permanent bad access entries may be cleared by the excess error trouble recovery program.

CALL REGISTER FORMATS (Cont)

SCANNER COLUMN FAULT LIST (CLFST)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
SCANNER ENABLE ADDRESS										*	*	*	*	*	*	CLF ST+0
ABOVE ENTRY'S MASK																CLF ST+1
SCANNER ENABLE ADDRESS										*	*	*	*	*	*	CLF ST+2
ABOVE ENTRY'S MASK																CLF ST+3
SCANNER ENABLE ADDRESS										*	*	*	*	*	*	CLF ST+4
ABOVE ENTRY'S MASK																CLF ST+5
SCANNER ENABLE ADDRESS										*	*	*	*	*	*	CLF ST+6
ABOVE ENTRY'S MASK																CLF ST+7

Notes:

(1) The scanner column fault location (CLF ST) is defined with its low two bits equal to 00, along with its length [CLFLENG = 8*E(8)], in program —LAYOUT—.

(2) Any bit set = 1 in the mask denotes a faulty column in the above entries frame.

(3) Column fault entries are made by —PURCV— when a working configuration cannot be found by the scanner output detection tests.

(4) Column fault entries are cleared by successfully restoring the scanner frame of interest to service.

CALL REGISTER FORMATS (Cont)

Data Control (DACON)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
				BASE LEVEL PROGRESS MARK —INPRET—												DACON+0
																DACON+1
													PP	XY	ON	DACON+2
				SECOND DATA FIELD EXECUTED												DACON+3
			ENABLE ADDRESS FORMAT													DACON+4
	J				K				L				M			DACON+5
																DACON+6
				FIRST DATA FIELD EXECUTED												DACON+7
				FIRST DATA FIELD PRINTED												DACON+8
				SECOND DATA FIELD PRINTED												DACON+9
				THIRD DATA FIELD PRINTED												DACON+10
				DIAGNOSTIC BUS —LOADED BY POBM EACH I050—												DACON+11
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CALL REGISTER FORMATS (Cont)

Peripheral Unit and Local CPD Transient Error List (ERRLST)

PU AND LOCAL CPD ENABLE ADDRESSES (15-6)	* (5)	* (4)	ERROR COUNT (3-0)	
				ERRLST+0
				ERRLST+1
				ERRLST+2
				ERRLST+3
				ERRLST+4
				ERRLST+5
				ERRLST+6
				ERRLST+7
				ERRLST+8
				ERRLST+9
				ERRLST+10
				ERRLST+11

Notes:

(1) The transient error list location (ERRLST) is defined with its low two bits = 00, and its length (ERRLENG = 12*E(8), in program —LAYOUT—.

(2) The excess error trouble program —PUETR— is activated when the error count for a given entry is exceeded (ERRMAX = 7) as defined in —PURCVA—.

(3) An emergency CU switch is requested (via —EMERSWI/PUETR—) when an entry cannot be made into this list because it is full.

(4) The transient error entry for a PU frame is cleared when either control R is restored to service, when it causes *3 action.

(5) The entire transient error list is cleared every hour on the hour (hourly/BLMMA).

CALL REGISTER FORMATS (Cont)

LINE SCANNER BAD ADDRESS LIST (LSCBAD)

15 LINE SCANNER ENABLE ADDRESS (15-6)	INACCESSIBLE ROW — IN BINARY — (5-0) 0	
		LSCBAD+0
		LSCBAD+1
		LSCBAD+2
		LSCBAD+3
		LSCBAD+4
		LSCBAD+5
		LSCBAD+6
		LSCBAD+7
		LSCBAD+8
		LSCBAD+9
		LSCBAD+10
		LSCBAD+11

Notes:

(1) The bad address locations (LSCBAD) and (PUBAD) is defined with their low two bits = 00. Along with their length (PUBLENG = 12*E(8)). In program —LAYOUT—.

(2) The excess error trouble recovery program —PUETR— is activated when the number of bad addresses for a particular line scanner frame is exceeded (BADMAX = —5) as defined in —PURCVA—, or when this list is full.

(3) Bad address entries are made by —PURCV— when a working configuration cannot be found for a given trouble.

(4) All bad addresses for a given frame are cleared when either controller in that frame is successfully restored to service. The maximum number of bad addresses have been exceeded resulting in an excess error trouble recovery call, or a required bad address entry for this frame cannot be made because the list is full resulting in an emergency CU switch attempt.

CALL REGISTER FORMATS (Cont)

Peripheral Unit and Local CPD Bad Address List (PUBAD)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

PU AND LOCAL CPD ENABLE ADDRESSES	DATA	
		PUBAD+0
		PUBAD+1
		PUBAD+2
		PUBAD+3
		PUBAD+4
		PUBAD+5
		PUBAD+6
		PUBAD+7
		PUBAD+8
		PUBAD+9
		PUBAD+10
		PUBAD+11

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Notes:

(1) The peripheral unit bad address location (PUBAD is defined with its low two bits equal to 00, along with its length [PUBLENG = 12*E(8)], in program —LAYOUT—.

(2) The excess error trouble recovery program —PUETR— is activated when the number of bad addresses for a particular unit is exceeded (BADMAX ≠ 5) as defined in —PURCVA—, or when this list is full.

(3) Bad address entries are made by —PURCV— when a working configuration cannot be found for a given trouble.

(4) All bad addresses for a given frame are cleared when either controller in that frame is successfully restored to service, the maximum number of bad addresses have been exceeded resulting in an excess error trouble recovery call, or a required bad address entry for this frame cannot be made because the list is full resulting in an emergency CU switch attempt.

CALL REGISTER FORMATS (Cont)

PURBUF (CPD Order Executing Request Filtering Loading)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
ENABLE ADDRESS FORMAT												TTY ADDRESS				PURBUF+0
IO50 ROUTINE EXECUTED —DCORD1—																PURBUF+1
			OD			TY		SB	PP	PH	RF	SF				PURBUF+2
CONTROLLER				CONTROL UNIT				REQUESTED FRAME								PURBUF+3
																PURBUF+4
	J				K			P				P				PURBUF+5
POLARITY OF PULSES DESIRED —1=NEGATIVE—																PURBUF+6
	X			Z			Y					NUMBER OF PULSES				PURBUF+7
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

PURBUF (Network Single Order Request Filtering Loading)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
		ENABLE ADDRESS FORMAT										TTY ADDRESS				PURBUF+0
FIRST IO50 ROUTINE EXECUTED —NWORD1—																PURBUF+1
			OD			TY			PP	PH	RF	SF				PURBUF+2
CONTROLLER				CONTROL UNIT				REQUESTED FRAME								PURBUF+3
SECOND IO50 ROUTINE EXECUTED —NWJ01, NWJ2, NWJ3, NWJ4—																PURBUF+4
	J				K			L				M				PURBUF+5
FIRST DATA EXECUTED —IF REQUIRED—																PURBUF+6
SECOND DATA EXECUTED —IF REQUIRED—																PURBUF+7
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CALL REGISTER FORMATS (Cont)

Typical Transient Call Record (TCR)

PROGRESS MARK (PM)											S U P
L/T	"A" PARTY										
L/T	"B" PARTY										
POB	PRTY S | P	S T R	C F R	C B V	T F R		F L H	E O T	F S T	TIMER	
	ORIGINATING REGISTER ADDRESS										
DGN			"A" SERVICE CIRCUIT								
			"B" SERVICE CIRCUIT								
CIRCUIT JUNCTØR ØR AUXILIARY ADDRESS											

```
CBV - CHANGE ABBREVIATED OPERATION
CFR - CONFERENCE IN PROGRESS
DGN - DIGIT NUMBER
EOT - ENTER ON TIME OUT FLAG (DIGIT INTERPRETATION)
FLH - DISTINGUISH FLASH SUPERVISION FROM ON HOOK
FST - SECOND TIME OUT IN PROGRESS
 LT - SET I IF PARTY IS A LINE, 0 IF A TRUNK
PRTY - P SET I IF "A" IS 2-PARTY LINE
       S SET I IF 2-PARTY LINE IS TIP, 0 IF RING
STR - SECOND TRY IN PROGRESS
SUP - SUPERVISION FLAG
TFR - TRANSFER CALL
```

SELECTED CALL STORE WORDS

AUDITS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

AUDBLK+3

```
* 0 —                                                    ) TTY CHANNEL*
* 1 —                                                    } ON MANUAL
* 2 —                                                    ) REQUESTS
```

* 0 —
* 1 —
* 2 —
* 3 — MANBIT — AUDITS IN MANUAL MODE
* 4 — TIMER1   TRKBIT   NOFPT
* 5 — TIMER2   MISBIT
* 6 — RSLF — RESTORE IDLE LINE FERRODS   JRART BIT
  7 — EABIT — EMERGENCY AUDIT IN PROGRESS.
  8 — ERRBIT — AT LEAST 1 ERROR WAS FOUND DURING AUDIT.
* 9 — INHIBIT — ALL AUDITS PRESENTLY INHIBITED. — M AU INH!-
       TCLBIT OR TCLRBT.
  10 — CLRTBL — TMR AUDIT IS RUNNING —
  11 — FULLBIT — MANUAL REQUEST FOR ALL AUDITS — M-AU ALL!
  12 — SPOBIT — AUDIT PRINTOUTS ARE INHIBITED — M AU SPO!
  13 — RLFBIT — LINE FERROD RESTORAL IN PROGRESS
  14 — AUDRUN — AUDITS RUNNING — CYCLE NOT COMPLETED THIS HOUR.
  15 — AUDPRI — AUDITS IN "FORCE" MODE. RUN AT LEAST 1 SEGMENT. EACH
       BASE LEVEL LOOP.

*SOME FLAG BIT DEFINITIONS VARY DEPENDING ON AUDIT BEING RUN. SEE
PR2H109 — ATTRIBUTES AND REFERENCES.

SELECTED CALL STORE WORDS (Cont)

MISCON — Maintenance Control Word (Word dd1 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	supplementary CPD (DS) trouble.
1-2 =	spare
3 =	local CPD (not PU enables) or IOCC trouble.
4 =	automatic identified outward dial frame trouble.
5 =	attendant data link frames trouble.
6-7 =	spare
8 =	at least one CC's main store contents mismatches its associated TDC tape's contents (main store is in back-dated state) or the BACKDT OFFICE DATA switch is erroneously active.
9-15 =	spare

CSAUDC — Printout Control Word (Word dd2 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	alarm monitor *even* scan field trouble.
1-5 =	spare
6 =	dial pulse timing bus trouble.
7 =	online CU IOCC maintenance state register audit failure.
8 =	4A timer failure.
9-11 =	spare
12 =	alarm monitor *odd* scan field trouble.
13-15 =	spare

ERPRTCTL — Printout Control Word (Word dd3 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	memory words (SYSTIM and SYSTIM+1) out of sync consult preceding REPT ERR CLK output message
1 =	an error which generates an interrupt is active consult preceding REPT ERR INT output message
2 =	the hold-get register's audit detected an error consult preceding REPT ERR HG output message
3 =	interrupt mask register's audit detected an error consult preceding REPT ERR IM output message
4 =	maintenance state register's audit detected an error consult preceding REPT MS output message
5 =	system status register's audit detected an error consult preceding REPT ERR SS output message
6 =	indicates at least one of the following switches is in the active state; either CU's POWER OFF or TEST MODE or the online CU's MANUAL switch
7-15 =	spare

SELECTED CALL STORE WORDS (Cont)

PRTCON — Printout Control Word (Word dd4 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	spare
1 =	inhibit continuity scan failure (MI CF aabb) printout.
2 =	inhibit High & Dry printouts.
3 =	inhibit AMAPGM (2H113) system trouble message (MI SY TL) originated because the AMA buffer is full.
4 =	inhibit POBM (2H102) from printing network power cross and false cross & ground (FCG) bad address messages (MI NW ADR fg hi 011c).
5 =	inhibit CTXIOD (2H306) from printing AIOD identification error (MI AD AER) message.
6 =	inhibit ringing current failure (MI L RCF) printout.
7-13 =	inhibit spare
14 =	inhibit scanner detection tests (BLMM 2H013, sym = RUNDET)
15 =	inhibit normal System Status Panel's display buffer pattern

AMR6CONT — Automatic Test Inhibit Control Word (Word dd5 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	spare
1 =	memory location PRTCON non zero, see dd4.
2 =	initialization sequence is in progress.
3 =	automatic trunk testing inhibited (M TK:AT).
4 =	automatic service circuit testing inhibited, see IM message M SV:AT.
5 =	automatic junctor circuit testing inhibited, see IM message M JC:AT.
6 =	automatic range extender circuit test inhibited, see IM message M RE:AT.
7 =	periodic audits are inhibited, see IM messages M AU:INH and M AU:RST.
8 =	spare
9 =	attendant loop circuit function inhibited
10 =	a multi-scan function has been inhibited or allowed see IM messages INH:MSF and ALW:MSF.
11 =	main store audit (update temporary memory) has been inhibited, see IM message INH:MASAU.
12 =	periodic recent change audits have been inhibited, see IM message A AU:INH.
13 =	recent change bit audit printouts are inhibited, the audit has not completed one cycle since the last tape access. See IM message A AU:RST and A AU:RC
14 =	a multi-scan function is active.
15 =	spare

SYSTAT — 3A CC — 2-Wire Program Interface Control Word (Word dd6 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	system state is normal update; no MRF or lockup.
1 =	system state is not in update; no MRF or lockup.
2 =	system state is lockup; no MRF.
3 =	system state is manual, lockup; (MRF possible).
4 =	system state is manual; no lockup, (MRF possible).
5-6 =	spare
7 =	an initialization interval is in progress.
8 =	service circuit trouble, -ckt lim- lamp on
9 =	trunk circuit trouble, -ckt lim- lamp on

SELECTED CALL STORE WORDS (Cont)

MISCON — Maintenance Control Word (Word dd1 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	supplementary CPD (DS) trouble.
1-2 =	spare
3 =	local CPD (not PU enables) or IOCC trouble.
4 =	automatic identified outward dial frame trouble.
5 =	attendant data link frames trouble.
6-7 =	spare
8 =	at least one CC's main store contents mismatches its associated TDC tape's contents (main store is in back-dated state) or the BACKDT OFFICE DATA switch is erroneously active.
9-15 =	spare

CSAUDC — Printout Control Word (Word dd2 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	alarm monitor *even* scan field trouble.
1-5 =	spare
6 =	dial pulse timing bus trouble.
7 =	online CU IOCC maintenance state register audit failure.
8 =	4A timer failure.
9-11 =	spare
12 =	alarm monitor *odd* scan field trouble.
13-15 =	spare

ERPRTCTL — Printout Control Word (Word dd3 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	memory words (SYSTIM and SYSTIM+1) out of sync consult preceding REPT ERR CLK output message
1 =	an error which generates an interrupt is active consult preceding REPT ERR INT output message
2 =	the hold-get register's audit detected an error consult preceding REPT ERR HG output message
3 =	interrupt mask register's audit detected an error consult preceding REPT ERR IM output message
4 =	maintenance state register's audit detected an error consult preceding REPT MS output message
5 =	system status register's audit detected an error consult preceding REPT ERR SS output message
6 =	indicates at least one of the following switches is in the active state; either CU's POWER OFF or TEST MODE or the online CU's MANUAL switch
7-15 =	spare

SELECTED CALL STORE WORDS (Cont)

PRTCON — Printout Control Word (Word dd4 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	spare
1 =	inhibit continuity scan failure (MI CF aabb) printout.
2 =	inhibit High & Dry printouts.
3 =	inhibit AMAPGM (2H113) system trouble message (MI SY TL) originated because the AMA buffer is full.
4 =	inhibit POBM (2H102) from printing network power cross and false cross & ground (FCG) bad address messages (MI NW ADR fg hi 011c).
5 =	inhibit CTXIOD (2H306) from printing AIOD identification error (MI AD AER) message.
6 =	inhibit ringing current failure (MI L RCF) printout.
7-13 =	inhibit spare
14 =	inhibit scanner detection tests (BLMM 2H013, sym = RUNDET)
15 =	inhibit normal System Status Panel's display buffer pattern

AMR6CONT — Automatic Test Inhibit Control Word (Word dd5 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	spare
1 =	memory location PRTCON non zero, see dd4.
2 =	initialization sequence is in progress.
3 =	automatic trunk testing inhibited (M TK:AT).
4 =	automatic service circuit testing inhibited, see IM message M SV:AT.
5 =	automatic junctor circuit testing inhibited, see IM message M JC:AT.
6 =	automatic range extender circuit test inhibited, see IM message M RE:AT.
7 =	periodic audits are inhibited, see IM messages M AU:INH and M AU:RST.
8 =	spare
9 =	attendant loop circuit function inhibited
10 =	a multi-scan function has been inhibited or allowed see IM messages INH:MSF and ALW:MSF.
11 =	main store audit (update temporary memory) has been inhibited, see IM message INH:MASAU.
12 =	periodic recent change audits have been inhibited, see IM message A AU:INH.
13 =	recent change bit audit printouts are inhibited, the audit has not completed one cycle since the last tape access. See IM message A AU:RST and A AU:RC
14 =	a multi-scan function is active.
15 =	spare

SYSTAT — 3A CC — 2-Wire Program Interface Control Word (Word dd6 of OP APPL STAT message)	
BIT	**DESCRIPTION**
0 =	system state is normal update; no MRF or lockup.
1 =	system state is not in update; no MRF or lockup.
2 =	system state is lockup; no MRF.
3 =	system state is manual, lockup; (MRF possible).
4 =	system state is manual; no lockup, (MRF possible).
5-6 =	spare
7 =	an initialization interval is in progress.
8 =	service circuit trouble, -ckt lim- lamp on
9 =	trunk circuit trouble, -ckt lim- lamp on

SYSTAT — 3A CC — 2-Wire Program Interface Control Word (Word dd6 of OP APPL STAT message)(Cont)	
BIT	**DESCRIPTION**
10 =	print an initialization message (M SY CLR).
11-12 =	spare
13 =	an initialization is in progress
14 =	spare
15 =	service loss lamp should remain lit (=> level 6).

SELECTED CALL STORE WORDS (Cont)

MSFMTX Layout

Word	Field
00	**RQB** — REQUEST BUFFER BITS FOR MSFS
01	**RQ** — REQUEST BITS FOR MSFS
02	**IP** — IN PROGRESS BITS FOR MSFS
03	**AB** — ABORT BITS FOR MSFS
04	**NA** — MASK FOR MSFS NOT ALLOWED BY SYSTEM STATE
05	**FORCNA** — MASK FOR MSFS FORCED NOT ALLOWABLE BY TTY
06	**CURMSF** — CURRENTLY EXECUTING MSF
07	**WAITACT** * / **WAITMSF** **

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

* WAITACT — An MSF is waiting via the WAIT subroutine.

** WAITMSF — Number of Last MSF to call WAIT subroutine.

SELECTED CALL STORE WORDS (Cont)

SYSTATE — System State Detector Buffer	
A bit equal to 1 has the given meaning.	
BIT	**DESCRIPTION**
0	Off-line 3A CC is in standby
1	Off-line 3A CC is out-of-service
2	Off-line 3A CC is unavailable
3	An initialization timing interval in progress
4	Off-line 3A CC is out-of-service due to automatic fault detection
5	Off-line 3A CC has been manually removed from service
6	Off-line 3A CC is out-of-service due to automatic update fault
7	Off-line 3A CC is out-of-service due to trouble recovery action
8	Off-line 3A CC has been removed from service and is in manual
9	Indicates which CU is on-line
10	On-line main store errors occurred
11	System status panel out of service
12	Maintenance channel is out-of-service
13	CU restoral is in progress, if DGN ATP OSA__FLT = 0
14	High priority maintenance update switch is in progress
15	Current status of off-line power key

3A INSTRUCTIONS

PH	PL	NOT USED	BA	OP CODE	
		23 16		14 8	7 0

A. SINGLE WORD INSTRUCTION

PH	PL	NOT USED	BA	OP CODE	
		23 16		14 8	7 0
PH	PL	NOT USED			
		23 16	15		0

B. DOUBLE WORD INSTRUCTION

GENERAL FORMAT OF 3A INSTRUCTION SET

RR— REGISTER TO REGISTER

P	P	BA	OP CODE	RX/OPT	RY
I	I	I	7	4	4

RN— REGISTER AND IMMEDIATE OPERAND

P	P	BA	OP CODE	R/OPT	N
I	I	I	7	4	4

RXR— REFERENCES MEMORY BY ADDING AN INDEX
REGISTER TO AN ADDRESS REGISTER PAIR

INDEX

P	P	BA	OP CODE	R/OPT	R
I	I	I	7	4	4

RXN— REFERENCES MEMORY BY ADDING 4—BIT INDEX
(N) TO AN ADDRESS REGISTER

INDEX

P	P	BA	OP CODE	R/OPT	N
I	I	I	7	4	4

RI— REGISTER AND IMMEDIATE DATA

| | | | I | I | I | 7 | 4 | 4 |

P	P	BA	OP CODE	R	R/OPT
P	P		I		
I	I		16		

SL— SPECIFIES 20-BIT DATA TO LOAD A REGISTER PAIR
OF REFERENCE MEMORY

| | | | I | I | I | 7 | 4 | 4 |

P	P	BA	OP CODE	R/OPT	
P	P		L		
I	I		16		

SS— SPECIFIES 8—BIT OFFSET IN BRANCH OPERATION

P	P	BA	OP CODE	OFFSET
I	I	I	7	8

DATA WORD FORMAT

NOT USED

PH	PL	DATA BITS W	DATA BITS Z	DATA BITS X	DATA BITS Y
25	24	23 22 16	15 8	7 4	3 0

RECENT CHANGE

CPD ADDRESS FORMAT

CPD
ADDRESS
BIT

9	8	7	6	5	4	3	2	1	0
VO ✳	H4	V4	V3	V2	V1	H3	H2	H1	H0
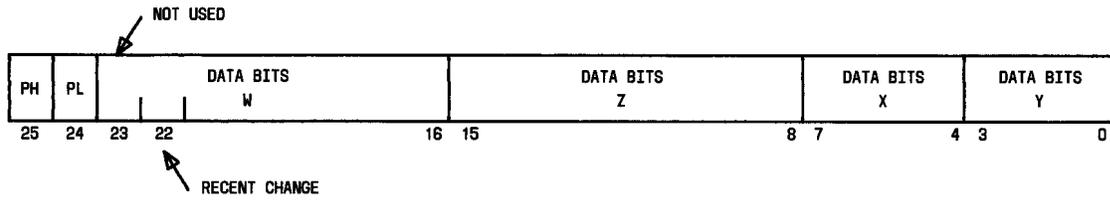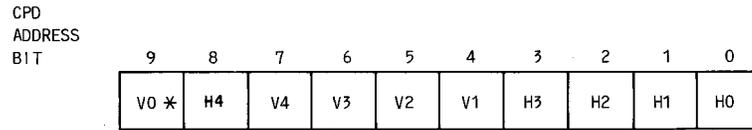
	WHEN NOT IN REMØTE MODE	WHEN IN REMØTE MODE
H0	= I/ØEA6	I/ØEA1
H1	= I/ØEA7	I/ØEA2
H2	= I/ØEA8	I/ØEA3
H3	= I/ØEA9	I/ØEA4
V1	= I/ØEA10	I/ØEA5
V2	= I/ØEA11	1
V3	= I/ØEA12	1
V4	= I/ØEA13	0
H4	= I/ØEA14	1
VO(POLARITY)	= I/ØEA15	I/ØEA0

✳ { 0 PRODUCES A POSITIVE PULSE
1 PRODUCES A NEGATIVE PULSE

ADDRESSING FOR SUPPLEMENTARY CPD

		15	14		12	11		9	8		6	5	4	3		1	0
3ACC EA	PH	PL	✳		X NEST		Z CARD			V TERMINAL		Z¹		Y¹			✳✳

R10

RZ | 1/16   Y | 1/8   X | 1/8

✳✳✳
37 32 31   16 15   8 7   0

PUA BUS

5   0

I/OEA   SPECIFIES LOCAL
CPD POINT THAT
SELECTS A SCPD
FRAME AND
CONTROLLER
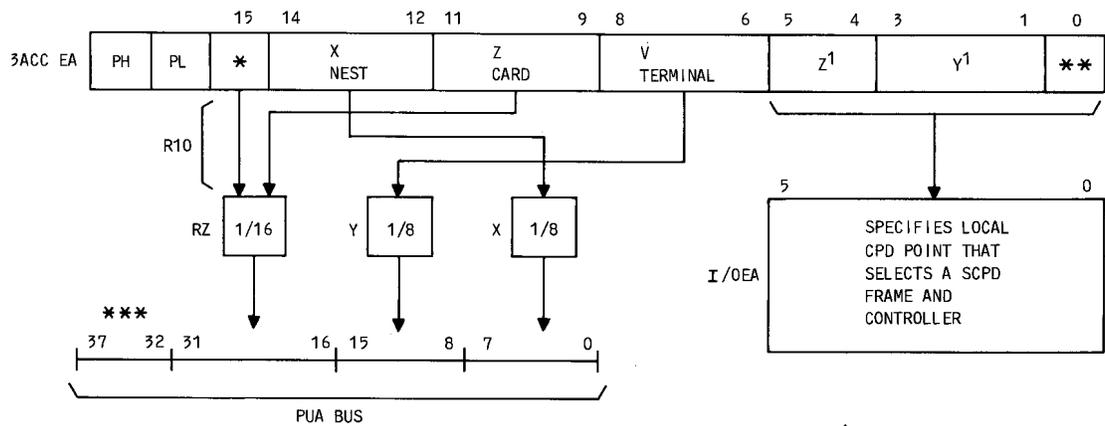
FIELD Z¹ = 4-7
FIELD Y¹ = 0-7

✳ SCPD PULSE POLARITY
✳✳ SPECIFIES SCPD CONTROLLER
✳✳✳ BITS (37-32) = "0" STATE
"CONSTANT" = MAINTENANCE OPTION

NETWORK DATA WORD FORMATS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
			N3	N2	N1	N0	S2	S1	S0	L2	L1	L0	G2	G1	G0

NOT USED   NETWORK   SWITCH   LEVEL   GRID

JUNCTOR NETWORK NUMBER (JNN)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CS	1	1	1	1	L4	L3	$\overline{L2}$	$\overline{L1}$	$\overline{L0}$	R5	R4	R3	R2	R1	R0

CONT SEL.   LINE SCANNER NUMBER   SCANNER ROW

LINE SCANNER ENABLE ADDRESS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
NOT USED	L4	L3	$\overline{L2}$	$\overline{L1}$	$\overline{L0}$	R5	R4	R3	R2	R1	R0	F3	F2	F1	F0

LINE SCANNER   SCANNER ROW   FERROD POSITION

LINE SCAN POINT NUMBER (LSPN)

NETWORK DATA WORD FORMATS (Cont)

BITS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
TFF	FCG	SD	FD	TF	GF	G	G7	G6	G5	G4	C	G3	G2	G1	∅G
6	OCTAL 5			OCTAL 4			OCTAL 3			OCTAL 2			OCTAL 1		

NETWORK DIAGNOSTIC BUS — OCTAL (TTY PRINTOUT) TO BINARY CONVERSION
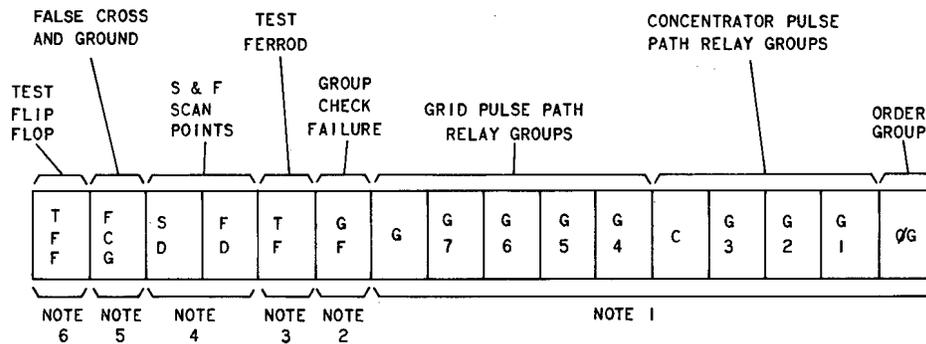
NETWORK DIAGNOSTIC BUS — BIT DEFINITIONS

Notes:

(1) These bits monitor the 10 W.S. relay groups. The meaning of these bits depends on the value of the "GF" bit, thus:

    (A) If GF = 1: A "0" in any position (except "G" and "C") specifies a "Group Check" failure for the group(s) indicated.

    (B) If GF = 0: A "0" in any position specifies at least one relay is operated for the group(s) indicated.

(2) "1" = Group Check Failure

(3) Monitors FCG ferrod in DS2 state and monitors the STG FF in all other states.

(4) S and F portion of controllers scan points transferred to DB.

(5) "1" = FCG order was given and no FCG failure was found.

(6) A multifunction flip-flop which gives diagnostics the ability to monitor the -EN (enable) flip-flop, the pulser "fired" output for one-part orders, and part of the controller's reset circuitry.

NETWORK DATA WORD FORMATS (Cont)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PP	1	0	1	0	CS	N3	N2	N1	N0	0	0	0	0	0	0

PULSE POLARITY   CONT. SEL.   NETWORK

NETWORK ENABLE

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	N3	N2	N1	N0	K5	K4	K3	K2	K1	K0	IS4	IS3	IS2	IL1	IL0

NOT USED   NETWORK   CONC. GROUP   CONC.   INPUT SWITCH   INPUT LEVEL

TERMINAL EQUIPMENT NUMBER (TEN)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	1	1	1	0	CS	TS3	TS2	TS1	TS0	R5	R4	R3	R2	R1	R0

CONT. SEL.   TRUNK SCANNER   SCANNER ROW

TRUNK SCANNER ENABLE

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
		TS3	TS2	TS1	TS0	R5	R4	R3	R2	R1	R0	F3	F2	F1	F0

NOT USED   TRUNK SCANNER   SCANNER ROW   FERROD ROW

TRUNK SCAN POINT NUMBER (SPN)

NETWORK ORDER STRUCTURE — CONTROLLER
SHIFT REGISTER

13	◄——— 2ND 14 BITS ———►	0	13	◄——— 1ST 14 BITS ———►	0

P	B	ØS2	ØSI	ØSO	ØL2	ØLI	ØLO	G2	GI	GO	K5	K4	K3	K2	KI	KO	IS2	ISI	ISO	ILI	ILO	ØR3	ØR2	ØRI	ØRO	O	I
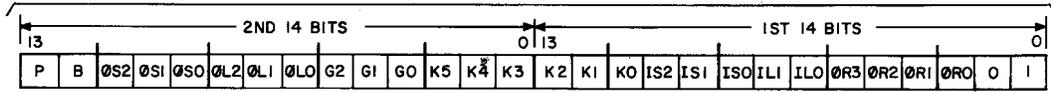
CONCENTRATOR GROUP=K5,K4,K3; CONCENTRATOR=K2,KI,KO					
STAGE O (LTS)			STAGE I (LTS)		
INPUT LEVEL	SWITCH	OUTPUT LEVEL	INPUT LEVEL	SWITCH	OUTPUT LEVEL
ILI,ILO	IS2,ISI,ISO	B,G2	IS2,ISI,ISO	B,G2	GI,GO

GRID = G2,GI,GO					
STAGE O (NCJS)			STAGE I (NCJS)		
INPUT LEVEL	SWITCH	OUTPUT LEVEL	INPUT LEVEL	SWITCH	OUTPUT LEVEL
K2,KI,KO	B,K4,K3	ØS2,ØSI,ØSO	B,K4,K3	OS2,ØSI,ØSO	ØL2,ØLI,ØLO

NETWORK PATH LINK RELAY CORRESPONDENCE

GROUP	INPUT REGISTER BITS	RELAY
ORDER GROUP (ØG)	ØR3,ØR2,ØRI,ØRO	ØR (YY)
GROUP I (GI)	KI, KO,ILI,ILO	PI (YY)
GROUP 2 (G2)	K2,IS2,ISI,ISO	P2 (YY)
GROUP 3 (G3)	B,G2,GI,GO	P3 (YY)
GROUP 4 (G4)	K2,KI,KO	P4 (Z)(X)
GROUP 5 (G5)	B,K4,K3	P5 (Z)(X)
GROUP 6 (G6)	ØL2,ØLI,ØLO	P6 (Z)(X)
GROUP 7 (G7)	ØS2,ØSI,ØSO	P7 (Z)(X)
CONC GROUP (C)	K5,K4,K3	CG (YY)
GRID (G)	G2,GI,GO	G (YY)

WHERE: YY = DECIMAL EQUIVALENT OF "INPUT REG BITS"
X = DECIMAL EQUIVALENT OF "INPUT REG BITS"
Z = DECIMAL EQUIVALENT OF G2,GI,GO

TEN,A,B,C—LINKS AND J—JUNCTOR
TEN=(NW)(K5,K4,K3)(K2,KI,KO)(IS2,ISI,ISO)(ILI,ILO)
A=(B,G2) (K5,K4,K3) (K2,KI,KO)(IS2,ISI,ISO)
B=(O,K4,K3) (K2,KI,KO) (B) (G2,GI,GO)
C=(B,K4,K3) (G2,GI,GO) (ØS2,ØSI,ØSO)
J=(ØS2,ØSI,ØSO) (ØL2,ØLI,ØLO) (G2,GI,GO)

◄——— LINE SCANNER EA ———►

0,	I	I	I	I	I	L4	L3	L2	LI	LO	ROW

CONTROLLER → LINE SCANNER ENABLE NO. ◄

*EXAMPLE: IF LINE SCANNER NO. (L4,L3,L2,LI,LO)
IS = 0,0,0,0,0 THEN THE CORRESPONDING
LINE SCANNER ENABLE NO. IS = 0,0,I,I,I.
WHERE: ROW= K4,K3,K2,KI,KO,IS2
FERROD =ISI,ISO,ILI,ILO
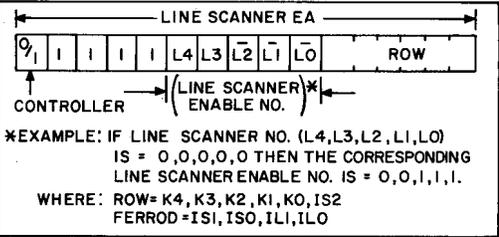
NETWORK ORDER STRUCTURE

ORDER NUMBER	NETWORK ORDER	CROSSPOINT OPERATION							TYPE OF ORDER
		CO	IST	2ND	FCG/NT	F	3RD	4TH	
0	MAINTENANCE ORDER (DUMMY LOAD)	NC	NC	NC	NC	NC	NC	NC	✓
I	CONNECT WITH CUTOFF AND F OPEN	O	C	C	NC	O✱✱	C	C	✓
2	CONNECT WITH CUTOFF OPEN (USE ORDER NO. I FOR 2ND PART)	NC / O	O / C	C / C	FCG✱✱ / NC	C✱✱ / O✱✱	C / C	O / C	FCGT (2-PART)
3	OPEN CUTOFF, AND IST STAGE	O	O	NC	NC	NC	NC	NC	✓
4	CLOSE CUTOFF OPEN IST STAGE	C	O	NC	NC	NC	NC	NC	✓
5	CONNECT WITH CUTOFF CLOSED AND F OPEN	C	C	C	NC	O✱✱	C	C	✓
6	CONNECT NO-TEST	NC	NC	NC	NT	C	NC	NC	FCGT
7	DISCONNECT NO-TEST	NC	NC	NC	FCG	O	NC	NC	✓
8✱	POWER CROSS (USE ORDER NO. 7 FOR 2ND PART)	O / NC	C / NC	C / NC	FCG✱✱ / FCG✱✱	C✱✱ / O✱✱	C / NC	C. / NC	PCT (2-PART) / ✓ (I-PART)✱
9	CLOSE 3RD, 4TH AND F STAGES	NC	NC	NC	FCG✱✱	C✱✱	C	C	FCGT
IO	TEST ORDER	NC	NC	NC	NC	NC	NC	NC	✓
II	CLOSE STAGES I, 2, F AND CUTOFF	C	C	C	FCG✱✱	C✱✱	NC	NC	FCGT
I2	CLOSE STAGES I, 2, F AND CUTOFF OPEN	O	C	C	FCG✱✱	C✱✱	NC	NC	FCGT
I3	CONNECT DIODE ACROSS TIP AND RING OF TEST VERTICAL	NC	NC	NC	NC	NC	NC	NC	FCGT
I4	RESTORE LINE FERROD, OPEN FIRST STAGE AND OPEN F	C	O	NC	NC	O	NC	NC	✓
I5	ORDER I5 FOLLOWED IMMEDIATELY BY RESET (AD36) IS THE RELEASE ORDER	NC	NC	NC	NC	NC	NC	NC	✓

LEGEND:	KEY FOR "TYPE OF ORDER"	FCC✱✱,O✱✱, C✱✱
O = PULSED OPEN C = PULSED CLOSED NC = NO CHANGE	✓ = NO FCG OR PC DONE FCGT = FCG TEST DONE PCT = PC TEST DONE ✱ = ORDER NO.7 NOT GIVEN IF "NO TEST" IS UP	IF THE GRID IS IN THE "NT" STATE, THEN FCG/NT = NT AND F = NC.

GENERIC OVERWRITE PROCEDURE

(SEE SECTION 232-304-303)

General Considerations:

(a) System must be able to run in normal mode.

(b) The following equipment must be in service: CU0, CU1, both TDCs and the MTCE TTY.

(c) All input and output messages are handled via the MTCE TTY, exclusively.

PROCEDURE

(1) If the tape copy procedures in Section 232-309-305 *have not been performed* within the previous week to generate duplicate tape cartridges, make duplicate tape cartridges at this time.

(2) Type: REPT:TAPE STAT!
Response: REPT TAPE 000000 (DC)
(DC) = don't care what information follows.

> CAUTION: Do not proceed unless the specified system response is given.

(3) Type: DGN: TAPE 0!
Response: DGN TAPE 0 ATP

> CAUTION: Do not proceed unless an ATP system response is given.

(4) Type: DGN:TAPE 1!
Response: DGN TAPE 1 ATP

> CAUTION: Do not proceed unless an ATP system response is given.

(5) Type: INIT:TAPE!
Response: INIT TAPE COMPL

(6) Type: ALW:OW!
Response: ALW OW COMPL

(7) Type: IN:GENID:XXXXXXXX!
Response: OK

(8) Type: IN:ISSID:XXXXXXXX!
Response: OK

(9) Type: IN:OW n; TTY!
n = Number from the BWT.
Response: IN OW COMPL

(10) Type: IN:OWDATA:ck, seg, adr, old, new!
Note: Repeat for each changed word.
Response: OK

(11) Type: OP:OW; TTY!
Response: OP OW n
IN OWDATA seg, adr, old, new
●
●
●
OP OW COMPL

(12) Visually inspect the contents of the overwrite buffer via the TTY output messages from Step 11. If any errors were made in the old or new data fields on input, repeat Step 10 for each incorrect entry. This will result in an IN OWDATA ERR warning message to be generated. For addressing errors, reinput all changes by restarting at Step 9.

(13) Type: VFY:OW:OLD!
Response: VFY OW COMPL

> CAUTION: Do not proceed unless the specified system response is given. If a mismatch is detected, resolve the mismatches and repeat Step 13.

(14) Type: OP:OW; TAPE!
Response: OP OW COMPL

GENERIC OVERWRITE PROCEDURE (Cont)

(SEE SECTION 232-304-303)

PROCEDURE (Cont)

(15) Repeat Steps 9 thru 14 for additional overwrites.

(16) At SSP operate LOCK key.
Response: REPT CU STAT UAV
At FORCE CU ACTIVE section of SSP—
On-line CU and CU FORCE lamps lighted.
At SYSTEM STATUS AND CONTROL—
On-line CU UNAVAILABLE LED, MANUAL
FORCED LED, and LOCK lamp lighted.

(17) Type: IN:OW n; TAPE!
Note: n = overwrite number from Step 9.
Response: IN OW COMPL

(18) Type: LOD:OW:NEW!
Note: This input message inhibits main store audits. If any action causes the main store audit to restart before
Step 22, the procedure must be restarted at Step 17 for all overwrites.
Response: LOD OW COMPL

(19) Type: VFY:OW:NEW!
Response: VFY OW COMPL
Note: Do not proceed unless the specified system response is given. If any error is found, repeat Steps 18 and 19.
If the errors are still found, manually request CU diagnostics and MAS audits for hardware memory faults.
Restart at Step 17 (for all overwrites) after the off-line CU is restored.

(20) Repeat Steps 17 thru 19 for additional overwrites.

(21) AT SSP release LOCK key.
Response: REPT CU STAT AVL
At FORCE CU ACTIVE section of SSP—
On-line CU and CU FORCE lamps extinguished
At SYSTEM STATUS AND CONTROL section —
On-line CU UNAVAILABLE LED, MANUAL
FORCED LED, and the LOCK lamp extinguished.

(22) Type: SW:CU!
Response: REPT SW CU a b

(23) Allow system to operate on the changed MAS for 15 to 30 minutes before proceeding to Step 24.

(24) Type: IN:OW n; TAPE!
Note: n = overwrite number from Step 9.
Response: IN OW COMPL

> *CAUTION: If the system attempts to bootstrap between the first and last activate*
> *(ACT:OW!) operations for coordinated overwrites, manually remove both tape*
> *cartridges and replace with the most recent backup cartridges. After recovery,*
> *deactivate all overwrites activated during this procedure on the original cartridges*
> *and reload by following the OFFICE UPDATE PROCEDURES USING ODA,*
> *Section 232-324-301.*

(25) Type: ACT:OW!
Response: ACT OW COMPL

(26) Type: LOD:OW:NEW!
Response: LOD OW COMPL

(27) Type: VFY:OW:NEW!
Response: VFY OW COMPL

(28) Type: UPD:OW!
Response: UPD OW COMPL

(29) Repeat Steps 24 thru 28 for additional overwrites.

(30) Type: STOP:OW! (Restarts MAS audits)
Response: ALW OW STOPPED

Trunk Test Panel Procedure (See Section 232-130-301 For Details)

(1) Operate an access key (AT1, AT2, or AT3)

(2) Place handset off-hook (SUPV lamp lights)

(3) Dial proper format:

CIRCUITS	CID	NUMBER OF DIGITS DIALED													
	1	2	3	4	5	6	7	8	9	.	.	.	.	.	20
Trk., Tone & SVC Ckt.	1	TGN			MEMN			ST							
Trk. with Outpulsing	1	TGN			MEMN			OP	DGT SENT					ST	
Subscriber Line	2	DIRECTORY NUMBER						ST							
Junctor	3	NN_A		NN_B		S_A	L_A	G_A	ST						
Range Extension	4	NN		CG	C	B	G	ST							
Attendant Loop	5	CTX			ATND		LOOP	PORT	ST						
Auto. Call Distributor	6	TGN			MEMN			OP	0/1	ST					

Note: JUCTR. & RE must use AT1 with AT2 idle.

(4) Observe equipment status lamp (steady lit-ckt was idle, 60 IPM — traffic busy, 120 IMP — MTCE busy)
P&E lamp lit steady if connection established

(5) To operate a PD point select correct PD group, depress PD point keys for PD points to be operated, press desired AT1, 2, 3 key.

Custom Calling Features: for DP replace "#" with 4-sec. time-out			
FEATURE		**USE**	**ACTUATE OR CHANGE**
SPEED CALL	8-Entry (codes 2-9)	Code, #	74#, DT, Code, Tel. No. (11-digit max.)
	30-Entry (codes 20-49)	Code, #	75#, DT, Code, Tel. No. (11-digit max.)
Add On		Flash, Dial 3rd Party, Flash	Flash to drop 3rd party †
Call Forwarding		72#, DT, Tel. No., establish connection, hang up. If no answer or busy repeat within two minutes: 72#, Tel. No., 2 short tones, hang up.	73# †

† Indicates action to cancel feature.

EQUIPMENT CODES, TITLES, AND ASSOCIATED CIRCUITS

CODE	TITLE	SD-
J1C050A	3A CC CIRCUIT	1C900-01
J1C052A	MAS CONTROLLER AND MEMORY CIRCUIT	1C902-01
J1C053A	TAPE DATA CONTROLLER	1C904-01
J1C054A	TTY CONTROLLER	1C905-01
	SYSTEM STATUS PANEL	1C906-01
J1C055A	SYSTEM STATUS PANEL CONTROLLER	1C907-01
J1C056A	SYSTEM STATUS PANEL RELAY CIRCUIT	1C908-01
J1C057A	PROCESSOR FRAME POWER UNIT	1C911-01
J1C060A	MAINTENANCE FRAME CIRCUIT	1C912-01
J2H017A	UNIVERSAL TRUNK & JUNCTOR	2H115-01
J2H017AC	UNIVERSAL TRUNK FRAME SCANNER	2H161-01
J2H017AE	TRUNK PERIPHERAL DECODER	2H115-01
J2H017AG	UNIVERSAL TRUNK FRAME SCANNER	2H161-01
J2H017AL	UNIVERSAL TRUNK FRAME SCANNER	2H161-01
J2H017AM	+48V SUPPLY & DISTRIBUTION	2H091-01
J2H017BA	OTC — LOC & TDM REV BAT SUPV	2H103-01
J2H017BA2-3	OGT CKT FOR LOC & TDM REV BAT SUPV	2H103-02
J2H017CA	TWO-WAY TRK SWBD NO. 3CL DIST BLDG (MD)	2H110-01
J2H017CA-2	TWO-WAY TRK SWBD NO. 3CL DIST BLDG	2H110-02
J2H017DA	JUNCTOR	2H102-01
J2H017GA	ITC — LOC & TDM REV BAT SUPV (A&M ONLY)	2H104-01
J2H017GB	INC TRK CKT FOR LOC & TDM REV BAT SUPV	2H101-01
J2H017GC	INC TRK CKT FROM SWBD NO. 3CL IN DIST BLDG	2H108-01
J2H018A	MISCELLANEOUS TRUNK FRAME	2H115-01
J2H018AA	TRUNK PERIPHERAL DECODER	2H115-01
J2H018A	TRUNK PERIPHERAL DECODER	2H115-01
J2H018AE	+48V SUPPLY & DISTRIBUTION	2H091-01
J2H018BA	OTC — SWBD NO. 3CL IN DIST BLDG	2H105-01
J2H018BC-2	OTC VERIF REQ & INCPT REV BAT	2H107-01
J2H018BD	OTC — LOCAL SWBD 3CL IN DIST BLDG	2H113-01
J2H018BE	OTC — X-BAR TAD, CAMA, TSP, OR TSPS	2H144-01
J2H018BF-2	OTC — LOC TST DESK NO. 14	2H141-01
J2H018BH	OTC TO REPAIR DESK NO. 2 HI-LOW SUPV	2H147-01
J2H018BK	TRK DIAL PULSE TRANSMITTER	2H122-01
J2H018BL	OTC — COIN ZONE DL 3CL IN DIST BLDG	2H151-01
J2H018CB	TWO-WAY TRK E&M LEAD SUPV	2H112-01
J2H018CD-3	TWO-WAY TRK CKT REV BAT SUPV INC HI-LO	2H148-01
J2H018CE-2	FOREIGN EXCHANGE TRK CKT GRD START	2H174-01
J2H018CF	TWO-WAY E&M LONG HAUL MF PULSING	2H158-01
J2H018CG	TWO-WAY E&M LONG HAUL DP	2H157-01

EQUIPMENT CODES, TITLES, AND ASSOCIATED CIRCUITS (Cont)

CODE	TITLE	SD-
J2H018CH	FX TRUNK CKT (LONG HAUL)	2H180-01
J2H018DA	CUSTOMER DIAL PULSE RECEIVER	2H114-01
J2H018DC-2	RINGING FOR INDV TWO-PTY CN & PBX	2H116-01
J2H018DD-2	TONE OR RECORDED ANNOUNCEMENT	2H118-01
J2H018DE	AUD RNG & RECORDED ANNOUNCEMENT	2H119-01
J2H018DG	MF TRANSMITTER	2H121-01
J2H018DJ	TRK DIAL PULSE RECEIVER	2H123-01
J2H018DK	MF RECEIVER	2H124-01
J2H018DL	COIN CONT-DIAL TONE 1ST & RANGE EXT	2H125-01
J2H018DM-1	RINGING CIRCUIT (A&M ONLY)	2H126-01
J2H018DM-2	RINGING CIRCUIT	2H126-02
J2H018DN	THREE PORT CONFERENCE	2H137-01
J2H018DP	ADMINISTRATIVE DATA LINK	2H097-01
J2H018DR-2	CENTREX ATTENDANT TRUNK	2H173-01
J2H018DS	DIAL PULSE REPEATER	2H155-01
J2H018DV	CUSTOMER DIAL PULSE RECEIVER	2H177-01
J2H018DW	6 PORT CONFERENCE CIRCUIT	2H176-01
J2H018DX	TIE TRUNK	2H178-01
J2H018DY	ATTENDANT TRUNK	2H182-01
J2H018DZ	LINE ACCESS TRUNK	2H186-01
J2H018FA	TRK PERIPHERAL DECODER APPLIQUE	2H117-01
J2H018FB	TRANSMISSION TEST TERMINATION	2H127-01
J2H018FC	CONTINUITY POLARITY TEST	2H128-01
J2H018FD	STATION RINGER TEST	2H129-01
J2H018FE	REM PERIPHERAL DECODER APPLIQUE	2H130-01
J2H018FF	TOUCH-TONE DETECTOR TEST	2H131-01
J2H018FG	TONE PRESENCE DETECTOR	2H132-01
J2H018FH-2	DIAL PULSE REVR TEST	2H133-01
J2H018FJ	MF TEST ENVIRONMENT	2H134-01
J2H018FK	RINGING & COIN CONT TST	2H135-01
J2H018FL-1	COMB MILLIWATT & LOOP AROUND TST (MD)	2H136-01
J2H018FL-2	COMB MILLIWATT & LOOP AROUND TST	2H136-02
J2H018FM	INTERRUPTER APPLIQUE	2H138-01
J2H018FP	TEST LINE COUPLER	2H159-01
J2H018FR	LINE INSULATION TEST	2H142-01
J2H018FS	AUXILIARY LINE	2H143-01
J2H018FT	STATION RINGER TEST	2H129-02
J2H018FV	GROUND CROSS DETECTING	2H096-01
J2H018FW	EMERGENCY MANUAL LINE	2H153-01
J2H018FX	TIMER CKT	2H095-01

EQUIPMENT CODES, TITLES, AND ASSOCIATED CIRCUITS (Cont)

CODE	TITLE	SD-
J2H018FY	PRECISE LEVEL TEST TONE	2H169-01
J2H018FZ	RANGE EXTENSION P.D. APPLIQUE	2H170-01
J2H018GA-2	ITC — LTC 14 OR LTC 3	2H109-01
J2H018GB	ITC — DISTANT SXS REV BAT SUPV	2H111-01
J2H018GC	ITC — SWBD NO. 3CL IN DISTANT BLDG	2H108-01
J2H018GE-2	INC TRK CKT LOCAL TANDEM REV BAT	2H149-01
J2H018GF	INC TRK CKT FROM SXS REV BAT SUP	2H154-01
J2H018HB	TRANS TST TERM CKT	2H185-01
J2H021A	AUTOMATIC MESSAGE ACCOUNTING	2H066-01
J2H022A	JUNCTOR GROUPING	2H086-01
J2H023A	SUPL CENTRAL PULSE DISTRIBUTOR	2H071-01
J2H024A	TRUNK TEST	2H075-01
J2H025A	LINE AND/TRUNK SWITCHING	LS-2H076-01
		LTS-2H163-01
J2H026A	NETWORK CONTROL — JUNCTOR SWITCHING	LS-2H076-01
		LTS-2H163-01
J2H026AK	PULSER	2H165-01
J2H027A	PROGRAM STORE	2H162-01
J2H028A	FILTER UNITS	—
J2H034A	RANGE EXTENSION	2H145-01
J2H037A	TOMUS CONTROLLER	2H175-01
J2H038B	TOMUS VERIFIER	2H181-01
J2H121AA	2B I/O CONTROL CIRCUIT	2H301-01
J86859A	+6.7V, 200A POWER PLANT	81880-01
J87298A	+6V DC-DC CONVERTER	81884-01
J87804B	RING & TONE	81870-01
J1A033DD-2	TOUCH-TONE CALLING DETECTOR	1A173-01
J1A033FD	MASTER SCANNER APPLIQUE UNIT	1A133-01
J1A033FR	TOUCH-TONE STATION TST	1A199-01
J1A033GA	REMOTE MASTER SCANNER APPLIQUE	1A210-01
J1A035C	PWR DISTRIBUTING	1A126-01
J1A043B	MASTER SCANNER	1A209-01
J1A048A	MISCELLANEOUS FRAME	1A129-01
		1A158-01
		1A213-01
J1A048AA	POWER DISTRIBUTION PANEL (130V)	1A144-01
J1A048AB	FLOOR ALARM CONTROL	1A158-01
J1A048AE	ALM BAT SUP CONTROL	1A158-01
J1A048AF	POWER ALARM	1A158-01
J1A048AJ	AISLE PILOT CONTROL	1A158-01

EQUIPMENT CODES, TITLES, AND ASSOCIATED CIRCUITS (Cont)

CODE	TITLE	SD-
J1A048AK, AL	EMERGENCY MANUAL LINE	1A156-01
J1A048AR	PWR FACTOR CORRECTION	1A213-01
J1A048AS	A-C DIST PANEL	1A213-01
J1A048AT	ALM GROUP CONTROL	1A158-01
J1A048AU	EMERGENCY MANUAL LINE	1A243-01
J1A053	FILTER UNITS	—
J1A058A	RECORDED ANNOUNCEMENT	1A139-01
ED-1A220-31	PROTECTOR FRAME	—
ED-1A222-31	COMBINED DISTRIBUTING FRAME	—
ED-1A224-31	INTERMEDIATE DISTRIBUTING FRAME	—

CIRCUITS, TITLES, AND ASSOCIATED EQUIPMENT CODES

SD-	TITLE	J-
1C900-01	3A CC CIRCUIT	1C050A
1C902-01	MAS CONTROLLER AND MEMORY CIRCUIT	1C052A
1C902-02	MAS CONTROLLER AND MEMORY CIRCUIT	1C052B
1C904-01	TAPE DATA CONTROLLER	1C053A
1C905-01	TTY CONTROLLER	1C054A
1C906-01	SYSTEM STATUS PANEL	1C055A
1C907-01	SYSTEM STATUS PANEL CONTROLLER	1C055A
1C908-01	SYSTEM STATUS PANEL RELAY CIRCUIT	1C056A
1C910-01	PROCESSOR FRAME CIRCUIT	1C058A
1C910-02	PROCESSOR FRAME CIRCUIT	1C058B
1C911-01	PROCESSOR FRAME POWER UNIT	1C057A
1C912-01	MAINTENANCE FRAME CIRCUIT	1C060A
1C914-01	SUPL MAS POWER UNIT	1C064A
1C915-01	SUPL MAS FRAME CIRCUIT	1C065A
2H000-01	KEY SHEETS	—
2H000-02	CURRENT DRAIN DATA	—
2H003-01	NO. 2 ESS CKT PACKS	—
2H010-01	TELETYPEWRITER CONTROL	2H003A
2H066-01	AUTOMATIC MESSAGE ACCOUNTING	2H021A
2H071-01	SUPL CENTRAL PULSE DISTRIBUTOR	2H023A
2H075-01	TRUNK TEST	2H024A
2H076-01	LINE SCANNER	2H025A
2H078-01	COMMUNICATION BUS	—
2H084-01	+24V and —48V PWR DISTRIBUTION	—
2H086-01	JUNCTOR GROUPING	2H022A
2H090-01	CDF ASSIGNMENT PRACTICES	—
2H091-01	+48V SUPPLY AND DISTRIBUTION	2H017AM
2H095-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H096-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H097-01	ADMINISTRATIVE DATA LINK (MD)	2H018DP-1
2H097-02	ADMINISTRATIVE DATA LINK	2H018DP-2
2H100-01	KEY SHEET	—
2H101-02	CURRENT DRAIN DATA	—
2H100-01 to 2H158-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H161-01	UNIVERSAL TRUNK FRAME SCANNER CKT	2H017AC
2H163-01	LINE AND/OR TRUNK SWITCHING CKT	2H025A
2H165-01	ELECTRONIC FERREED PULSER CKT	2H026AK
2H166-01	PERIPHERAL DECODER ASSIGN RULES	—
2H167-01	SCANNER ASSIGN RULES	—

CIRCUITS, TITLES, AND ASSOCIATED EQUIPMENT CODES (Cont)

SD-	TITLE	J-
2H168-01	CPD ASSIGN RULES	—
2H169-01 to 2H170-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H172-01 to 2H174-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H177-01 to 2H180-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H181-01	TOMUS VERIFIER	2H037B
2H182-01 to 2H186-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
2H301-01	2B I/O CONTROL CIRCUIT	2H121AA
81870-01	RING AND TONE	87804B
1A126-03	PWR DIST FRAME	1A035C
1A133-01	MASTER SCANNER APPLIQUE	1A033FD
1A139-01	RECORDED ANNOUNCEMENT	1A058A
1A144-01	+130V DISTRIBUTION	1A048AA
1A148-01	+24V AND −48V DISTRIBUTION	—
1A156-01	EMERGENCY MANUAL LINE	1A048AK, AL
1A158-01	OFFICE ALARM	1A04A, AB
1A133-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
1A173-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
1A199-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	—
1A209-01	MASTER SCANNER	1A043B
1A210-01	SEE TRUNKS, SERVICE CKTS, AND MISC CKTS	1A048A
1A213-01	A-C DISTRIBUTION	1A048AR, AS
1A243-01	EMERGENCY MANUAL LINE	1A048U

TRUNKS, SERVICE CIRCUITS, AND MISCELLANEOUS CIRCUITS

SD-	TITLE	J	TOC	NBR 2″ MTG PLT	CKTS PER UNIT	PER CKT PD BUFFERS	PORTS	SCAN POINTS SLOW	FAST	BY-LINK	DI-RECTED
2H095-01	TIMER CKT	2H018FX	744	2	1	—	—				1
2H096-01	GROUND CROSS DETECTING	2H018FV	745	1	1	—	—				3
2H101-01	INC TRK CKT FOR LOC AND TDM REV BAT SUPV	2H017GB	156		4	1		2			
2H102-01	JUNCTOR CKT (UNIV TRK)	2H017DA	600	1	4	1	1	2			
2H103-01	OTC — LOC & TDM REV BAT SUPV (UNIV TRK)(MD)	2H017BA	001	1	4	1	1	2			
2H103-02	OGT CKT FOR LOC AND TDM REV BAT SUPV	2H017BA-3	001	1	4	1	1	2			
2H104-01	ITC — LOC & TDM REV BAT SUPV (UNIV TRK)(A&M ONLY)	2H017GA	102	1	4	1	1	2			
2H105-01	OGT CKT TO SWBD TO BCI IN DISTANT BLDG HI-LO SUPV REV BAT RB 0 CONT ON TIP AND RING	2H018BA	203	1	1	2		2			2
2H107-01	OTC VERIF REQ & INCPT REV BAT, HI-LO SUPV	2H018BC	204	1	1	2	1		2		
2H108-01	INC TRK CKT FROM SWBD NO. 3CL IN DISTANT BLDG 3RD WIRE C CONT SIMPLI-FIED RF-RING SIGNAL	2H018GC	305	1	1	2	1	2			2
2H109-01	ITC — LOC TST DSK NO. 14 OR LOC TST CAB NO. 3	2H018GA-2	306	1	1	3	1	2			4
2H110-01	TWO-WAY TRK SWBD NO. 3CL IN DIST BLDG (UNIV TRK)(MD)	2H017CA	407	1	4	1	1		2		
2H110-02	TWO-WAY TRK SWBD NO. 3CL IN DIST BLDG (UNIV TRK)	2H017CA-2	481	1	4	1	1		2		
2H111-01	ITC — DIST S X S REV BAT SUPV (A&M ONLY)	2H018GB	108	1	2	1	1		2		
2H112-01	TWO-WAY TRK E & M LEAD SUPV	2H018CB	509	2	2	2	1	2	2*	2*	

* Depending on use.

TRUNKS, SERVICE CIRCUITS, AND MISCELLANEOUS CIRCUITS (Cont)

SD-	TITLE	J	TOC	NBR 2" MTG PLT	CKTS PER UNIT	PER CKT PD BUFFERS	PORTS	SCAN POINTS SLOW	FAST	BY-LINK	DI-RECTED
2H113-01	OTC LOCAL SWBD NO. 3CL IN DIST BLDG	2H018BD	210	2	1	4	2	2			4
2H114-01	CUSTOMER DIAL PULSE RCVR CKT (A&M ONLY)	2H018DA	611	1	1	1	1				1
2H115-01	TRUNK PERIPHERAL DECODER CKT	2H017AE		4	32	—	—				
2H116-01	RNG CKT FOR IND TWO-PTY CN & PBX LINES	2H018DC-2	612	1	2	1	1	1			1
2H117-01	TRK PERIPHERAL DECODER APPLIQUE	2H018FA	713	1	24	1/3	—				
2H118-01	TONE OR RECORDED ANNOUNCEMENT	2H018DD-2	614	1	12	—	1				
2H119-01	AUDIBLE RING & RECORDED ANNOUNCEMENT	2H018DE	615	1	6	—	1				
2H121-01	MF TRANSMITTER CKT	2H018DG	617	2	1	3	1				4
2H122-01	TRK DIAL PULSE TRANSMITTER	2H018BK	618	2	2	1	1				2
2H123-01	TRK DIAL PULSE RECEIVER	2H018DJ	619	3	3	1	1				1
2H124-01	MF RECEIVER	2H018DK	620	2	1	1	1				8
2H125-01	COIN CONT — DIAL TONE 1ST & RANGE EXTENSION	2H018DL	621	1	1	2	1				3
2H126-01	RINGING CIRCUIT (A&M ONLY)	2H018DM-2	622	1	1	2	1	1			1
2H126-02	RINGING CIRCUIT	2H0803	673	1	1	1	1	1			1
2H127-01	TRANSMISSION TEST TERM	2H018FB	723	1	1	3	3	3			
2H128-01	CONTINUITY POLARITY TEST	2H018FC	724	1	1	1	1				1
2H129-01	STATION RINGER TEST (MD)	2H018FD	725	2	1	3	2				3
2H129-02	STATION RINGER TEST	2H018FT	725	2	1	3	2				3
2H130-01	REMOTE PERIPHERAL DECODER APPLIQUE	2H018FE	726	1	6	1/3	—				
2H131-01	TOUCH-TONE DETECTOR TEST	2H018FF	727	2	1	3	1				3
2H132-01	TONE PRESENCE DETECTOR	2H018FG	728	2	1	1	1	1			

TRUNKS, SERVICE CIRCUITS, AND MISCELLANEOUS CIRCUITS (Cont)

SD-	TITLE	J	TOC	NBR 2″ MTG PLT	CKTS PER UNIT	PER CKT PD BUFFERS	PER CKT PORTS	SCAN POINTS SLOW	SCAN POINTS FAST	SCAN POINTS BY-LINK	SCAN POINTS DI-RECTED
2H133-01	DIAL PULSE RECEIVER TEST	2H018FH	729	2	1	2	1				1
2H134-01	MF TEST ENVIRONMENT	2H018FJ	730	2	1	2	2				1
2H135-01	RINGING & COIN CONTROL TEST	2H018FK	731	1	1	2	1				2
2H136-01	COMBINED MILLIWATT & LOOP TEST (MD)	2H018FL	732	1	1	2	2	2			
2H136-02	COMBINED MW BAL. TERM, AND LOOP AROUND TEST CIRCUIT	2H018FL	732	1	1	2	2	2			
2H137-01	THREE PORT CONFERENCE CKT	2H018DN	633	2	1	4	3	3			
2H138-01	INTERRUPTER APPLIQUE CKT	2H018FM	734	1	8	2/3	—				
2H141-01	OTC — LOC TEST DESK NO. 14	2H018BF-2	235	2	1	1	2				
2H142-01	LINE INSULATION TEST CKT	2H018FR	736	5	1	4	1				3
2H143-01	AUXILIARY LINE CKT	2H018FS	737	1	6	1/3	—				
2H144-01	OTC — X-BAR TDM, CAMA, TSP, OR TSPS	2H018BE	238	1	2	2	1		2		
2H145-01	RANGE EXTENSION	2H034A	6	24	1/3	—					
2H147-01	OTC REPAIR SERVICE	2H018BH	248	1	1	1	1	2			
2H148-01	2 WAY TRK CKT REV BAT SUPV INC HI-LO OUT FAR OFF REQ START PULSING SIG	2H018CD-3	550	1	1	2	1	2			
2H149-01	INC TRK CKT LOCAL TANDEM REVERSE BATTERY	2H018GE-2	149	1	1	1	1	2			
2H151-01	OTC COIN ZONE DL 3CL IN DIST BLDG	2H018BL	239	3	1	4	2				
2H154-01	INC TRK CKT FROM STEP BY STEP REV BAT SUPV	2H018GF	157	1	2	1	1		2		
2H155-01	DIAL PULSE REPEATER CKT	2H018DS	660	2	2	1	1	2			
2H157-01	TWO-WAY E&M LONG HAUL DP	2H018CG	565	3	1	2	1	2	2*		

* Incoming Dial Pulse Only

SD-	TITLE	J	TOC	NBR 2″ MTG PLT	CKTS PER UNIT	PER CKT		SCAN POINTS			
						PD BUFFERS	PORTS	SLOW	FAST	BY-LINK	DI-RECTED
2H158-01	TWO-WAY E&M LONG HAUL MF PULSING	2H018CF	566	2	1	2	1	2	2*		
2H159-01	TEST LINE COUPLER	2H018FP	767	1	2	1	2	1			
2H169-01	PRECISE LEVEL TEST TONE	2H018FY	746	1	1	1	1				
2H169-02	PRECISE LEVEL TEST TONE	2H018FY-02	784	1	1	4	1				1
2H170-01	NO TST OPERATOR APPLQ FOR R.E.	2H018FZ	747	1	6	1/3	—				
2H172-01	ATT LOOP CKT WITH AUTONOMOUS TERMINATION	2H018FN	751	1	6	2	2	2			
2H173-01	CENTREX ATTENDANT TRUNK CIRCUIT	2H018DR-2	652	2	2	2	1		1**		
2H174-01	FOREIGN EXCHANGE TRK CKT GRD START	2H018CE-2	553	1	4			2			
2H176-01	6 PORT CONF	2H018DW	662	3	1	6	6	6			
2H177-01	CUSTOMER DIAL PULSE RECEIVER CKT	2H018DV	658	2	1	1	1				
2H178-01	TIE TRUNK CKT	2H018DX	668	2	2	1	—				
2H180-01	FX TRUNK CKT (LONG HAUL)	2H018CH	564	2	1	2	1	2			
2H182-01	ATTENDANT TRUNK CKT	2H018DY	678	3	2	2	2	1			
2H183-01	REMOTE OFFICE TEST LINE	2H039A	771	2	1	1	5				
2H184-01	105 TEST LINE APPLIQUE	2H03AD	770	1	1	1	1	1			
2H185-01	TRANS TST TERM CKT	2H018HB	769	1	1	2	2	2			
2H186-01	LINE ACCESS TRUNK CKT	2H018DZ	672	1	1	2	1	2			
1A133-01	MASTER SCANNER APPLIQUE	1A033FD	742	1	32	—	—				32
1A173-01	TOUCH-TONE CALLING DETECTOR	1A033DD-2	640	3	2	—	—				9
1A199-01	TOUCH-TONE STATION TEST	1A033FR	741	4	1	—	—				9
1A210-01	REMOTE MASTER SCANNER APPLIQUE	1A033GA	743	1	8	—	—				8

** Periodic Control

82 PIN CONNECTOR PIN NUMBERING

TOP

ROW NUMBERS

3   2   1   0   UPPER COAX
TERM FIELD
(CTF)

CTF EXAMPLE
PIN 34
(3RD ROW 4TH PIN)

19
18
17
16
15
14
13
12
11
10

GND 2

GNDO

947A
CONNECTOR
PINS

09
08
07
06
05
04
03
02
01
00

LOWER COAX
TERM FIELD
(CTF)

3
2
1
0

3   2   1   0

42 PIN CONNECTOR PIN NUMBERING

TOP

ROW NUMBERS

UPPER COAX
TERM FIELD
(CTF)

CONNECTOR PIN
EXAMPLE PIN 206
(2ND ROW 06 PIN)

GND2

GNDO

9478
CONNECTOR
PINS

LOWER COAX
TERM FIELD
(CTF)
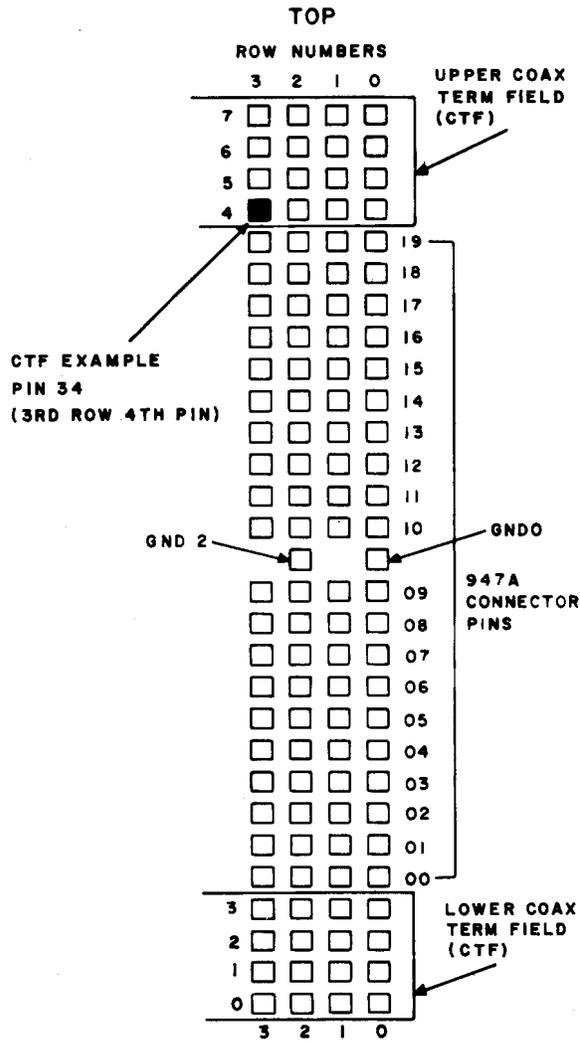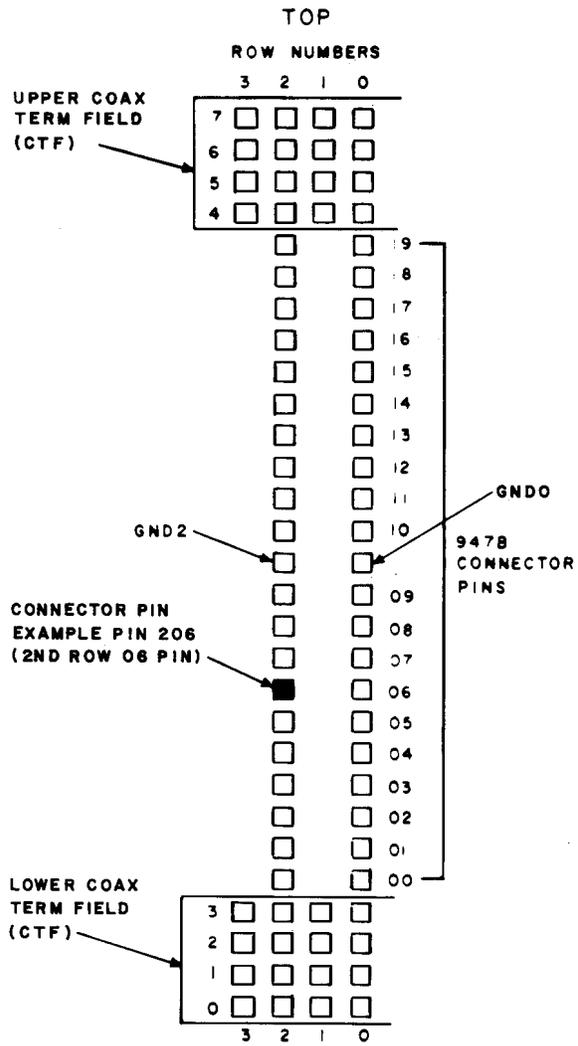
WIRING ARRANGEMENTS OF TYPE 1B FERROD SENSOR ASSEMBLY
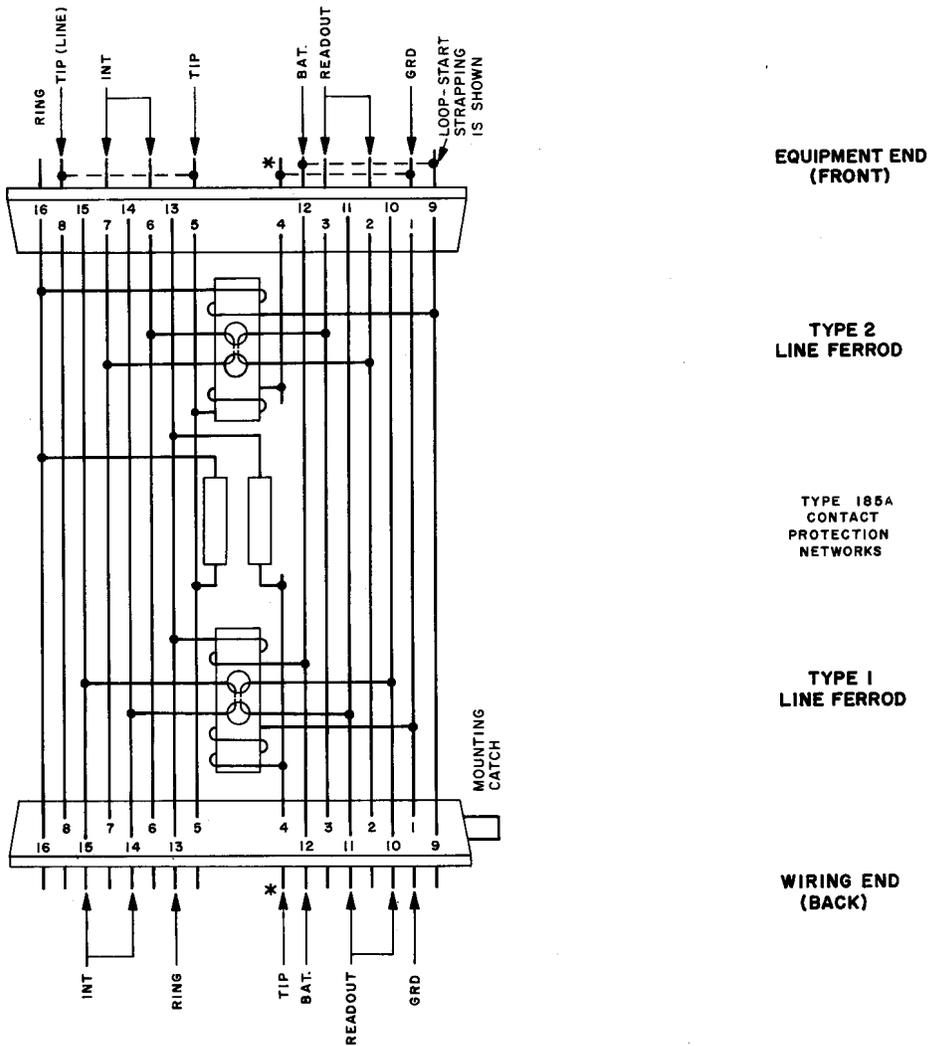
* NO. 4 WIRE ROD IS CUT BETWEEN THE FRONT
AND BACK FERROD UNIT.

WIRING ARRANGEMENTS OF TYPE 1C OR 1D FERROD SENSOR ASSEMBLY
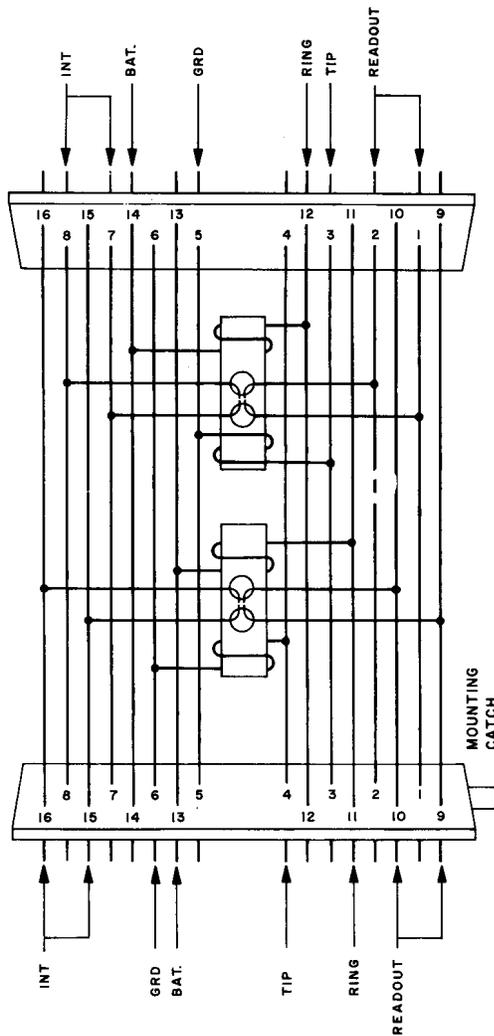
EQUIPMENT END
(FRONT)

TYPE IC ASSEMBLY
CONTAINS 2
TYPE 3 FERRODS
(JUNCTOR)

TYPE ID ASSEMBLY
CONTAINS 2
TYPE 4 FERRODS
(TRUNK)

WIRING END
(BACK)

TYPE 1B, 1C, AND 1D FERROD SENSOR
ASSEMBLIES — END VIEWS

EQUIPMENT END
(FRONT)

TERMINAL NUMBERS
ARE FOR
REFERENCE ONLY

WIRING END
(BACK)
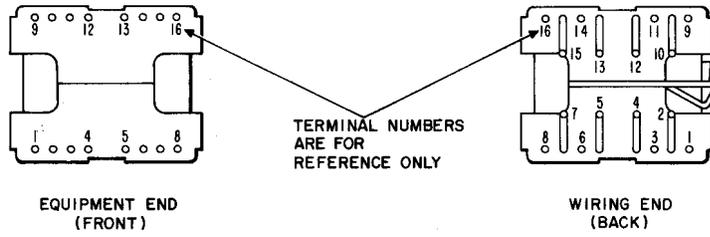
A. END VIEWS OF TYPE 1B, 1C, AND 1D FERROD SENSOR ASSEMBLIES

TYPE 1E FERROD SENSOR ASSEMBLY —
END VIEWS

EQUIPMENT END
(FRONT)

TERMINAL NUMBERS
ARE FOR
REFERENCE ONLY

WIRING END
(BACK)
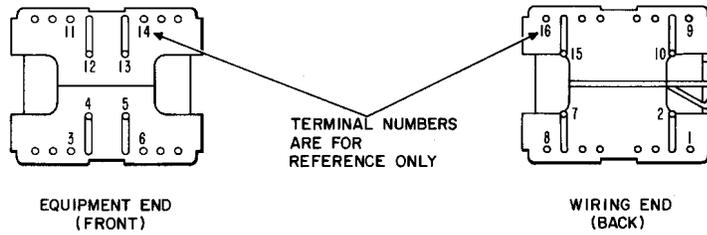
B. END VIEWS OF TYPE 1E FERROD SENSOR ASSEMBLY

STRAPPING OF TYPE 2 FERRODS IN TYPE 1B SENSOR
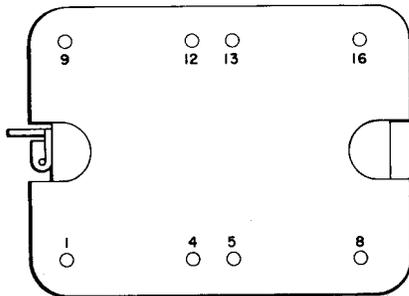
STRAPPING FOR TRUNK OPERATION   STRAPPING FOR LOOP-START OPERATION   STRAPPING FOR GROUND START OPERATION

2B PROCESSOR CPD EQUIPMENT LAYOUT
FIXED ASSIGNMENTS FOR LCPD 0 AND 1

ACTUAL CIRCUIT PACK LOCATION → 1   5   10   14 16   20   25   29 31   35   40   44

DEFINED AS CPD PACK NUMBER → 1 3 5 7 1 3 5 7 1 3 5 7 1 3 5 7   1 3 5 7

(Left panel)

POSITION NOT USED

PDA
PDA0A

SEE NOTE 7

(ONE FC206 CIRCUIT PACK — 16 CPD POINTS PER CIRCUIT PACK — 32 CIRCUIT PACKS PER UNIT)

POSITION NOT USED

	DEFINED NEST 0	DEFINED NEST 1	DEFINED NEST 2	DEFINED NEST 3	CONTROL	DEFINED NEST 4
	0 2 4 6	0 2 4 6	0 2 4 6	0 2 4 6		0 2 4 6

(Right panel — Defined Nests 5, 6, 7)

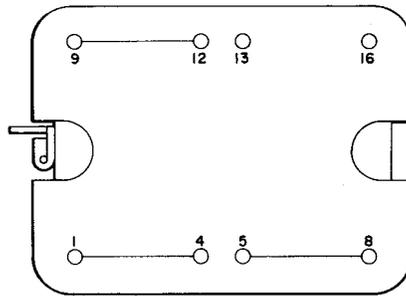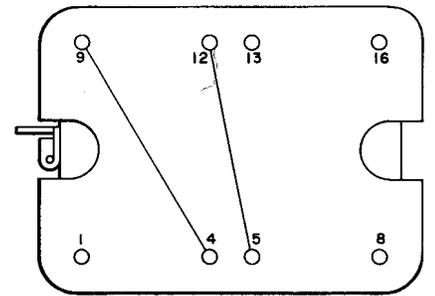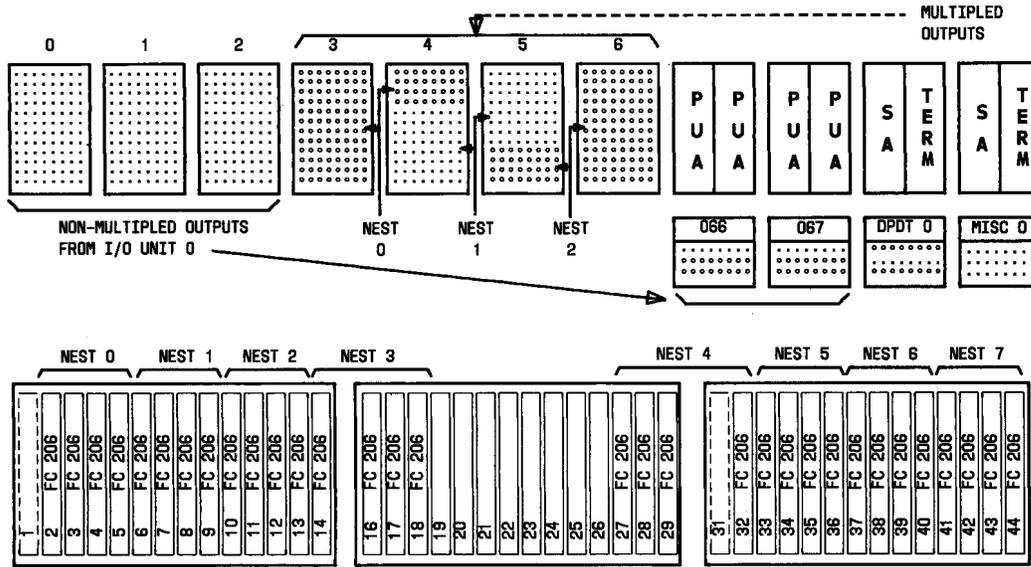| Term	1	3	5	7	1	3	5	7	1	3	4	7
7			AMA1 PD	CDL1 7EN($_1^0$)			SCPD7 PC1	CDL3 7EN($_1^0$)			LSC8 EN($_{CD}^{AB}$)($_1^0$)	LSC24 EN($_{CD}^{AB}$)($_1^0$)
6	LTN14 CO	LTN14 C1	AMA0 PD	CDL1 6EN($_1^0$)			SCPD6 PC1	CDL3 6EN($_1^0$)			LSC9 EN($_{CD}^{AB}$)($_1^0$)	LSC25 EN($_{CD}^{AB}$)($_1^0$)
5	LTN13 CO	LTN13 C1	ADL RDL0	CDL1 5EN($_1^0$)			SCPD5 PC1	CDL3 5EN($_1^0$)			LSC10 EN($_{CD}^{AB}$)($_1^0$)	LSC26 EN($_{CD}^{AB}$)($_1^0$)
4	LTN12 CO	LTN12 C1	ADL RDL4	CDL1 4EN($_1^0$)			SCPD4 PC1	CDL3 4EN($_1^0$)			LSC11 EN($_{CD}^{AB}$)($_1^0$)	LSC27 EN($_{CD}^{AB}$)($_1^0$)
3	LTN11 CO	LTN11 C1	ADL RDL3	CDL1 3EN($_1^0$)	TSC11 OPC	TSC11 1PC	SCPD3 PC1	CDL3 3EN($_1^0$)	TSC11 EN($_{01}^{00}$)	TSC11 EN($_{11}^{10}$)	LSC12 EN($_{CD}^{AB}$)($_1^0$)	LSC28 EN($_{CD}^{AB}$)($_1^0$)
2	LTN10 CO	LTN10 C1	ADL RDL2	CDL1 2EN($_1^0$)	TSC10 OPC	TSC10 1PC	SCPD2 PC1	CDL3 2EN($_1^0$)	TSC10 EN($_{01}^{00}$)	TSC10 EN($_{11}^{10}$)	LSC13 EN($_{CD}^{AB}$)($_1^0$)	ENCD($_1^0$)
1	LTN9 CO	LTN9 C1	ADL RDL1	CDL1 1EN($_1^0$)	TSC9 OPC	TSC9 1PC	SCPD1 PC1	CDL3 1EN($_1^0$)	TSC9 EN($_{01}^{00}$)	TSC9 EN($_{11}^{10}$)	LSC14 EN($_{CD}^{AB}$)($_1^0$)	AMA (C)EN1
0	LTN8 CO	LTN8 C1		CDL1 0EN($_1^0$)	TSC8 OPC	TSC8 1PC		CDL3 0EN($_1^0$)	TSC8 EN($_{01}^{00}$)	TSC8 EN($_{11}^{10}$)	LSC15 EN($_{CD}^{AB}$)($_1^0$)	AMA (C)EN0
7	LTN7 CO	LTN7 C1	SCPD7 EN($_1^0$)	CDL0 7EN($_1^0$)	TSC7 OPC	TSC7 1PC	SCPD7 PC0	CDL2 7EN($_1^0$)	TSC7 EN($_{01}^{00}$)	TSC7 EN($_{11}^{10}$)	LSC0 EN($_{CD}^{AB}$)($_1^0$)	LSC16 EN($_{CD}^{AB}$)($_1^0$)
6	LTN6 CO	LTN6 C1	SCPD6 EN($_1^0$)	CDL0 6EN($_1^0$)	TSC6 OPC	TSC6 1PC	SCPD6 PC0	CDL2 6EN($_1^0$)	TSC6 EN($_{01}^{00}$)	TSC6 EN($_{11}^{10}$)	LSC1 EN($_{CD}^{AB}$)($_1^0$)	LSC17 EN($_{CD}^{AB}$)($_1^0$)
5	LTN5 CO	LTN5 C1	SCPD5 EN($_1^0$)	CDL0 5EN($_1^0$)	TSC5 OPC	TSC5 1PC	SCPD5 PC0	CDL2 5EN($_1^0$)	TSC5 EN($_{01}^{00}$)	TSC5 EN($_{11}^{10}$)	LSC2 EN($_{CD}^{AB}$)($_1^0$)	LSC18 EN($_{CD}^{AB}$)($_1^0$)
4	LTN4 CO	LTN4 C1	SCPD4 EN($_1^0$)	CDL0 4EN($_1^0$)	TSC4 OPC	TSC4 1PC	SCPD4 PC0	CDL2 4EN($_1^0$)	TSC4 EN($_{01}^{00}$)	TSC4 EN($_{11}^{10}$)	LSC3 EN($_{CD}^{AB}$)($_1^0$)	LSC19 EN($_{CD}^{AB}$)($_1^0$)
3	LTN3 CO	LTN3 C1	SCPD3 EN($_1^0$)	CDL0 3EN($_1^0$)	TSC3 OPC	TSC3 1PC	SCPD3 PC0	CDL2 3EN($_1^0$)	TSC3 EN($_{01}^{00}$)	TSC3 EN($_{11}^{10}$)	LSC4 EN($_{CD}^{AB}$)($_1^0$)	LSC20 EN($_{CD}^{AB}$)($_1^0$)
2	LTN2 CO	LTN2 C1	SCPD2 EN($_1^0$)	CDL0 2EN($_1^0$)	TSC2 OPC	TSC2 1PC	SCPD2 PC0	CDL2 2EN($_1^0$)	TSC2 EN($_{01}^{00}$)	TSC2 EN($_{11}^{10}$)	LSC5 EN($_{CD}^{AB}$)($_1^0$)	LSC21 EN($_{CD}^{AB}$)($_1^0$)
1	LTN1 CO	LTN1 C1	*SCPD1 EN($_1^0$)	CDL0 1EN($_1^0$)	TSC1 OPC	TSC1 1PC	SCPD1 PC0	CDL2 1EN($_1^0$)	TSC1 EN($_{01}^{00}$)	TSC1 EN($_{11}^{10}$)	LSC6 EN($_{CD}^{AB}$)($_1^0$)	LSC22 EN($_{CD}^{AB}$)($_1^0$)
0	LTN0 CO	LTN0 C1	RT ST($_{11}^{10}$)	CDL0 0EN($_1^0$)	**TSC0 OPC	TSC0 1PC	RT ST($_{01}^{00}$)	CDL2 0EN($_1^0$)	TSC0 EN($_{01}^{00}$)	TSC0 EN($_{11}^{10}$)	LSC7 EN($_{CD}^{AB}$)($_1^0$)	LSC23 EN($_{CD}^{AB}$)($_1^0$)

DEFINED NEST 5	DEFINED NEST 6	DEFINED NEST 7
0 2 4 6	0 2 4 6	0 2 4 6

* SEE NOTE 5
** SEE NOTE 6

2B PROCESSOR CPD EQUIPMENT LAYOUT
FIXED ASSIGNMENTS FOR LCPD 0 AND 1 (Cont)

LEGEND:

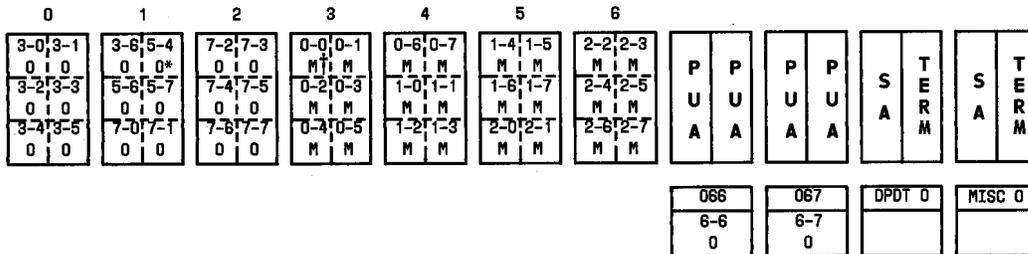|			
ADL	ADMINISTRATIVE DATA LINK	RDL ( )	LEAD DESIGNATION
AMA	AUTOMATIC MESSAGE ACCOUNTING	RT	RINGING AND TONE FRAME
(A)EN(B)	BUS (A) ENABLE CONTROLLER (B)	SCPD(A)	SUPPL CPD FRAME (1-7)
(A)PC	CONTROLLER (A) POWER CONTROL	EN(B)	FRAME (A) ENABLE VIA BUS (B)
C(A)	CONTROLLER (A)	ST ( )	LEAD DESIGNATION
EN	LEAD DESIGNATION	TSCn	TRUNK SCANNER n
EN(A)(B)	ENABLE CONTROLLER (A) ON BUS (B)		
$EN\binom{AB}{CD}\binom{0}{1}$	ENABLE CONTROLLERS A AND B OR C AND D ON BUS 0 OR 1	CDL(0,1,2,3)	CENTREX DATA LINK FRAME (0,1,2,3)
LSC	LINE SCANNER	(A)CH(B)	UNIT (A) ENABLE VIA BUS (B)
LTN	LINE TRUNK NETWORK		
PDA	PERIPHERAL DECODER APPLIQUE		
PDAOA	PERIPHERAL DECODER APPLIQUE FOR OFFICE ALARM CKT		

Notes:

(1) All fixed assigned CPD points shown in nests 5, 6 & 7 assigned to a box with a slash in its lower right corner and all CPD points in nests 0, 1, 2 & 4 (except CPD point 000) are multipled between CPD matrices as part of frame wiring. Nest 3, CPD packs 0-6, are not multipled and should be reserved for future use. CPD pack 7 is multipled and can be used for MT's, RE's, etc. The CPD points in nest 3. CPD packs 0-6 will be used for additional TSC ( ) assignments as the 2B processor capacity approaches 38,000 CCS. When reserving this area creates a need for a SCPD the operating CO should be advised that these points could be assigned to nest 3 — however they will have to be moved when TSC16 is assigned.

(2) Each line scanner will be controlled by either controllers A and B or controllers C and D. Line scanner enables must be sequentially assigned. Do not leave sequential line scanner enable CPD points unassigned to accommodate growth of individual networks.

(3) CPD points 010 and 011 shall be assigned to the PD's which control the PD applique unit having connection to the office alarm circuit. CPD point 010 shall be assigned to the PD controlling ckts 0-11 and CPD point 011 shall be assigned to the PD controlling ckts 12-23. CPD points 012 thru 017 are reserved for other PD applique units, auxiliary line units or remote trunk PD applique units.

(4) CPD points 556 and 557 are assigned to the peripheral decoder circuit packs located on the AMA frame.

(5) There can be as many as eight CPD matrices in a No. 2B ESS office. These matrices are numbered 0-7 with the local CPD being the "0" matrix. Matrices 1-7 are located on SCPD frames 1-7, respectively. There is no SCPD "0" frame.

(6) The CPD assignments (desig OPC and IPC) shown in nest 6, CPD packs 0-3 are assigned only when the indicated trunk scanner is a master scanner. Since TSC0 is always a MS, CPD points 600 and 620 are always assigned to MS00.

(7) CPD point 000 in all local and supplementary matrices is reserved for maintenance functions and should not be assigned to any circuit.
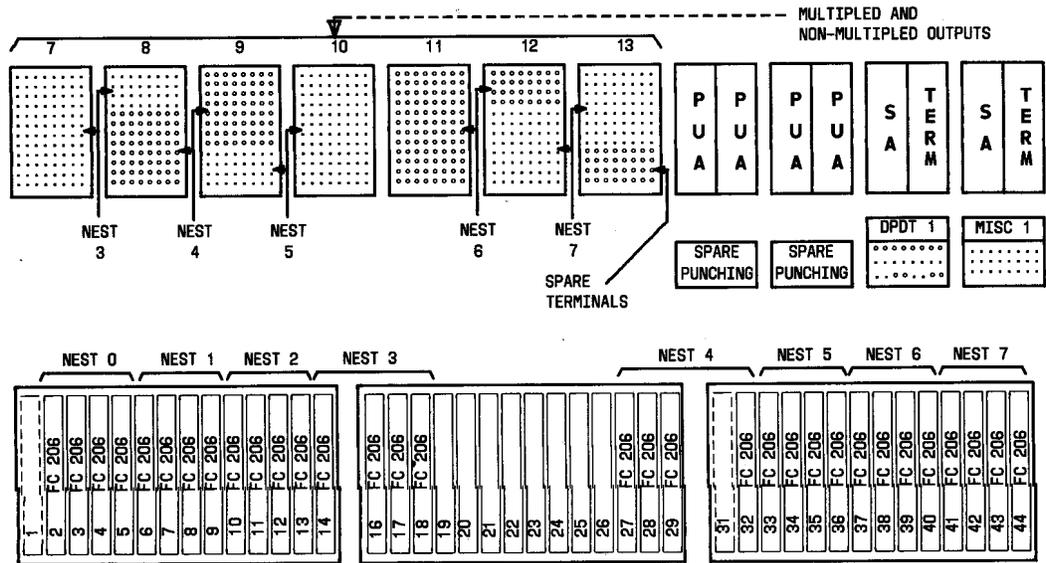
INPUT/OUTPUT UNIT 0

```
                                          ┌────────────────────── MULTIPLED
                                          ▽                       OUTPUTS
      0        1        2      ┌ 3     4     5     6 ┐
   ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐┌──────┐┌──────┐┌──────┐  ┌─┐┌─┐ ┌─┐┌─┐ ┌─┐┌──┐ ┌─┐┌──┐
   │      │ │      │ │      │ │      ││      ││      ││      │  │P││P│ │P││P│ │S││T │ │S││T │
   │      │ │      │ │      │ │      ││      ││      ││      │  │U││U│ │U││U│ │A││E │ │A││E │
   │      │ │      │ │      │ │      ││      ││      ││      │  │A││A│ │A││A│ │ ││R │ │ ││R │
   │      │ │      │ │      │ │      ││      ││      ││      │  │ ││ │ │ ││ │ │ ││M │ │ ││M │
   └──────┘ └──────┘ └──────┘ └──────┘└──────┘└──────┘└──────┘  └─┘└─┘ └─┘└─┘ └─┘└──┘ └─┘└──┘
   └─ NON-MULTIPLED OUTPUTS ─┘  NEST    NEST    NEST
      FROM I/O UNIT 0            0       1       2            ┌──066─┐ ┌──067─┐ ┌DPDT 0┐ ┌MISC 0┐
```

NEST 0   NEST 1   NEST 2   NEST 3 ... NEST 4   NEST 5   NEST 6   NEST 7

(FC 206 card positions 1–44)

DETAILS OF I/O UNIT 0 CPD TERMINAL STRIPS

0	1	2	3	4	5	6
3-0 ¦ 3-1	3-6 ¦ 5-4	7-2 ¦ 7-3	0-0 ¦ 0-1	0-6 ¦ 0-7	1-4 ¦ 1-5	2-2 ¦ 2-3
O ¦ O	O ¦ O*	O ¦ O	M† ¦ M	M ¦ M	M ¦ M	M ¦ M
3-2 ¦ 3-3	5-6 ¦ 5-7	7-4 ¦ 7-5	0-2 ¦ 0-3	1-0 ¦ 1-1	1-6 ¦ 1-7	2-4 ¦ 2-5
O ¦ O	O ¦ O	O ¦ O	M ¦ M	M ¦ M	M ¦ M	M ¦ M
3-4 ¦ 3-5	7-0 ¦ 7-1	7-6 ¦ 7-7	0-4 ¦ 0-5	1-2 ¦ 1-3	2-0 ¦ 2-1	2-6 ¦ 2-7
O ¦ O	O ¦ O	O ¦ O	M ¦ M	M ¦ M	M ¦ M	M ¦ M

PUA PUA | PUA PUA | SA TERM | SA TERM

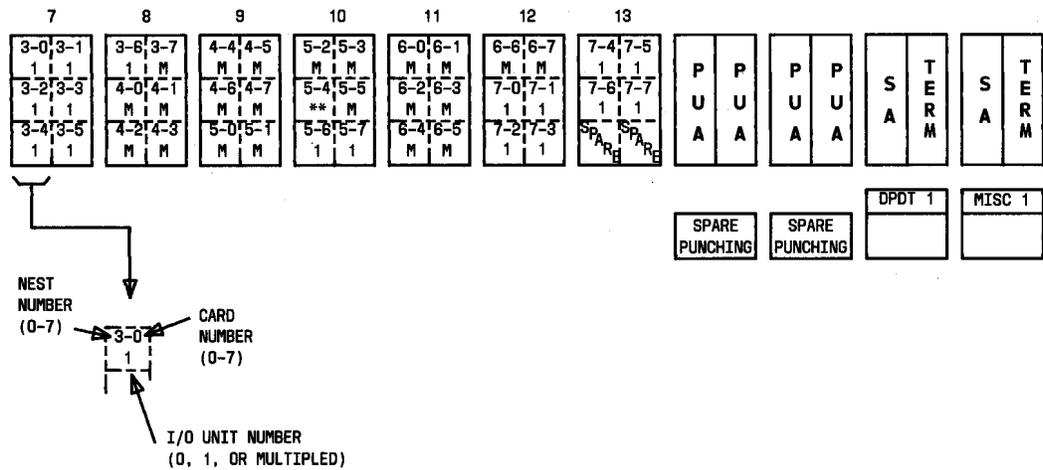| 066	067	DPDT 0	MISC 0
6-6	6-7		
0	0		

* – OUTPUT 0 IS NOT CONNECTED TO THIS CARD GROUP ON TS1 BECAUSE
IT IS A MULTIPLED OUTPUT AND APPEARS ON TS 10 (OUTPUT 0 IS
MULTIPLIED, OUTPUTS 1–7 ARE ASSIGNED TO I/O UNIT 1).

† – OUTPUT 0 IS NOT USED. CPD OUTPUT 000 IS NOT BROUGHT OUT TO
THE CPD TERMINAL STRIPS. THE OUTPUT IS USED AS A MAINTENANCE
TEST POINT AND IS TERMINATED INSIDE THE I/O CIRCUIT ON THE
FC 207 CIRCUIT PACK. OUTPUTS 1 TO 7 ARE MULTIPLED.
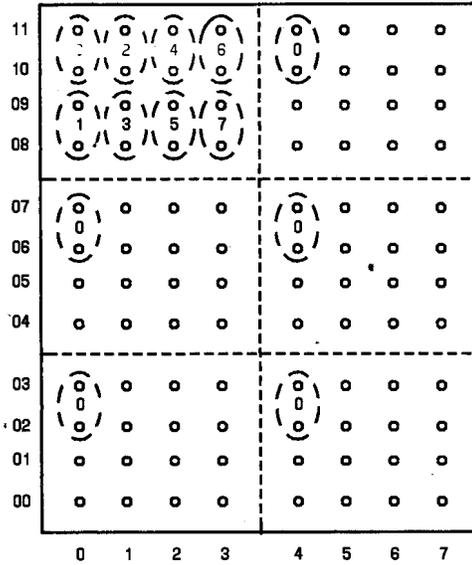
INPUT/OUTPUT UNIT 1

MULTIPLED AND
NON-MULTIPLED OUTPUTS

NEST 3   NEST 4   NEST 5   NEST 6   NEST 7

SPARE PUNCHING   SPARE PUNCHING

DPDT 1   MISC 1

SPARE TERMINALS

NEST 0   NEST 1   NEST 2   NEST 3   NEST 4   NEST 5   NEST 6   NEST 7

DETAILS OF I/O UNIT 1 CPD TERMINAL STRIPS

NEST NUMBER (0-7)

CARD NUMBER (0-7)

I/O UNIT NUMBER
(0, 1, OR MULTIPLED)

CPD

TERMINAL STRIPS

0-13

(FRONT VIEW)

THIS DIAGRAM SHOWS THE GENERAL ARRANGEMENT OF
INDIVIDUAL CPD OUTPUT PAIRS ON TERMINAL STRIPS 0-13. THE
INDIVIDUAL CPD OUTPUT NUMBERS, (0-7), ARE THE LEAST
SIGNIFICANT DIGIT OF THE OCTAL CPD ADDRESS.

NEST NUMBER ──▷ 0 0 0 ◁── INDIVIDUAL CPD OUTPUT
CARD NUMBER ──↗   NUMBERS
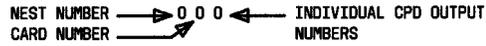
THE MOST SIGNIFICANT DIGIT, THE NEST NUMBER, DESIGNATES
ONE-OF-EIGHT GROUPS, (0-7), OF 64 INDIVIDUAL OUTPUTS. THE
CARD NUMBER, (0-7), SUBDIVIDES THE 64 OUTPUT PAIRS IN A
NEST INTO EIGHT GROUPS OF EIGHT INDIVIDUAL OUTPUTS. A
CARD GROUPING OF OUTPUTS ON A TERMINAL STRIP IS
EQUIVALENT TO ONE OF THE DASHED BOXES IN THIS FIGURE. THE
NEST GROUPING IS EQUIVALENT TO EIGHT OF THE DASHED BOXES.

CPD

TERMINAL STRIPS

066 AND 067

(FRONT VIEW)
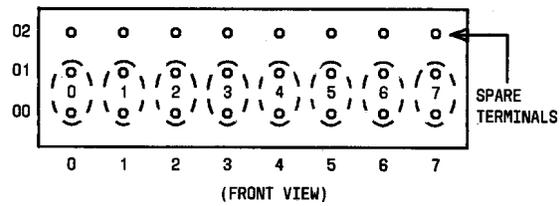
   THIS DIAGRAM SHOWS THE GENERAL ARRANGEMENT OF INDIVIDUAL
CPD OUTPUTS ON TERMINAL STRIPS 066 AND 067. 066
AND 067, ALONG WITH TERMINAL STRIPS 0, 1, & 2, PROVIDE
THE TERMINAL STRIP APPEARANCES FOR THE NON-MULTIPLED CPD
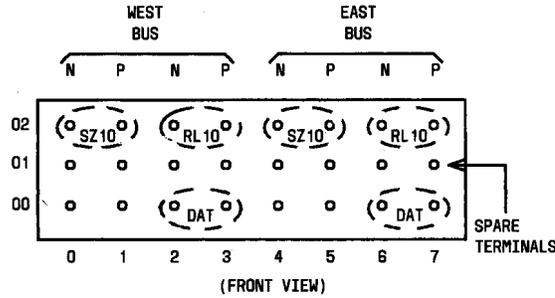OUTPUTS FROM THE I/O CIRCUIT IN BAY 0.
   TERMINAL STRIP 066 CONTAINS CPD OUTPUTS 0-7 OF NEST 6,
CARD 6, I/O CIRCUIT 0, (660-667).
   TERMINAL STRIP 067 CONTAINS CPD OUTPUTS 0-7 OF NEST 6,
CARD 7, I/O CIRCUIT 0, (670-677).

CPD

TERMINAL STRIPS

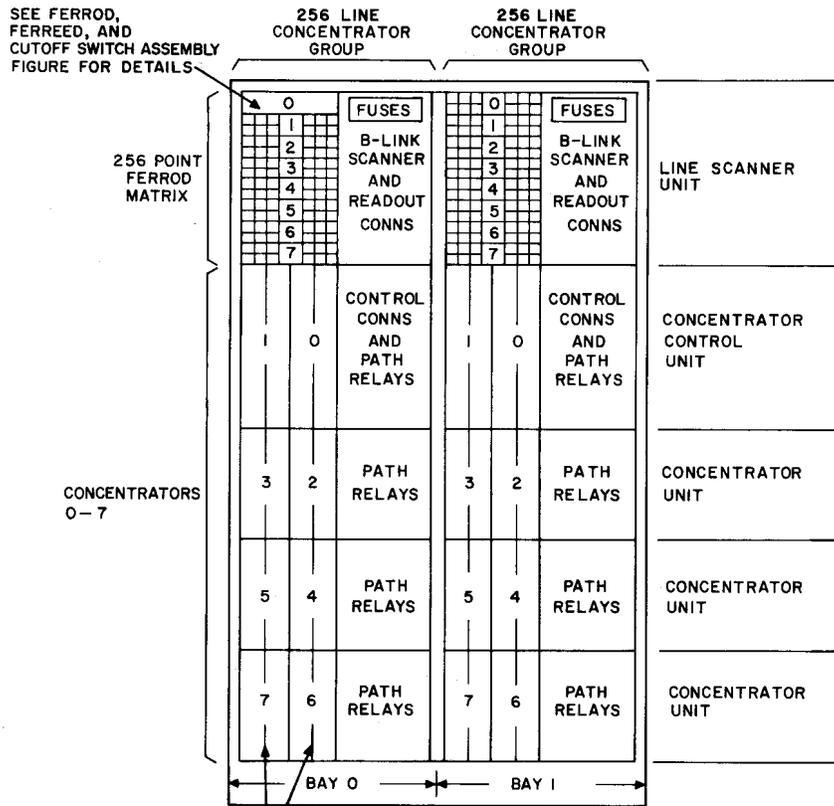## DPDT 0 AND DPDT 1

(FRONT VIEW)

THIS DIAGRAM SHOWS THE GENERAL ARRANGEMENT OF THE DIAL PULSE AND DATA TIMING OUTPUT TERMINAL STRIPS ON I/O CONTROL CIRCUIT 0 AND 1. EACH I/O CIRCUIT HAS OUTPUT PAIRS FOR AN EAST AND A WEST DIAL PULSE TIMING BUS, AND TWO OUTPUT PAIRS FOR THE DATA TIMING BUS.

EACH BRANCH OF THE DATA TIMING BUS HAS AN OUTPUT PAIR WHICH SENDS "SEIZE" SIGNALS TO PERIPHERAL EQUIPMENT, AND ONE OUTPUT PAIR WHICH SENDS "RELEASE" SIGNALS. (SZ10 AND RL10 RESPECTIVELY). THE "SEIZE" AND "RELEASE" PULSES ARE SENT UNDER CONTROL OF THE 3ACC AND ARE USED BY THE PERIPHERAL EQUIPMENT TO GENERATE 10 PPS DIAL PULSE TIMING FOR DIAL PULSE TRANSMISSION.

THE DATA TIMING BUS IS NORMALLY CONNECTED TO THE "DAT" TERMINALS IN THE EAST BUS SECTION OF THE TERMINAL STRIP. THE REMAINING PAIR OF "DAT" OUTPUT TERMINALS IN THE WEST BUS SECTION WILL NORMALLY BE TERMINATED WITH A 100Ω RESISTOR.

IF ONLY ONE DIAL PULSE TIMING BUS BRANCH IS USED, THE EAST BUS WILL BE USED. IN THIS CASE, THE WEST BUS "SEIZE" AND "RELEASE" OUTPUTS WILL EACH BE TERMINATED WITH A 100Ω RESISTOR.

LINE TRUNK SWITCHING FRAME

SEE FERROD,
FERREED, AND
CUTOFF SWITCH ASSEMBLY
FIGURE FOR DETAILS

256 LINE CONCENTRATOR GROUP

256 LINE CONCENTRATOR GROUP

256 POINT FERROD MATRIX

FUSES
B-LINK SCANNER AND READOUT CONNS

FUSES
B-LINK SCANNER AND READOUT CONNS

LINE SCANNER UNIT

CONTROL CONNS AND PATH RELAYS

CONTROL CONNS AND PATH RELAYS

CONCENTRATOR CONTROL UNIT

CONCENTRATORS 0 – 7

PATH RELAYS

PATH RELAYS

CONCENTRATOR UNIT

PATH RELAYS

PATH RELAYS

CONCENTRATOR UNIT

PATH RELAYS

PATH RELAYS

CONCENTRATOR UNIT

BAY 0

BAY I

SEE FERROD, FERRED, AND CUTOFF
SWITCH ASSEMBLY FIGURE FOR DETAILS

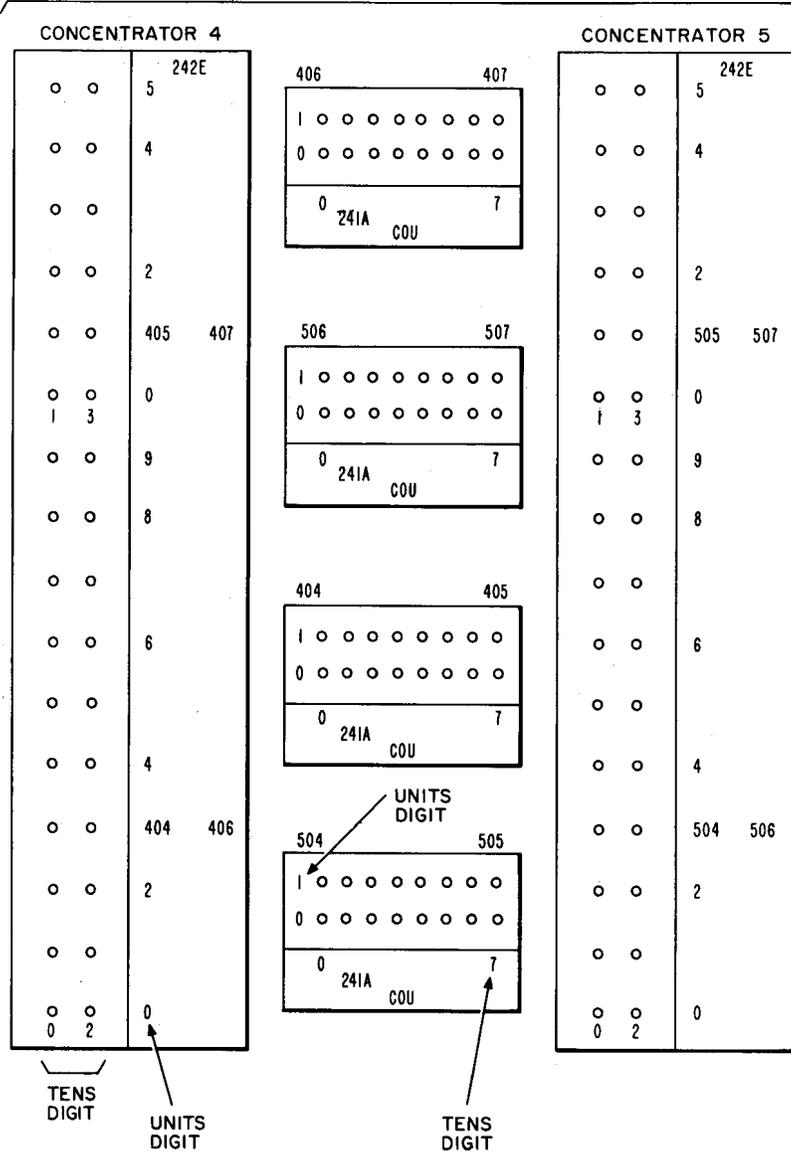**FERROD, FERREED AND CUTOFF SWITCH ASSEMBLY**
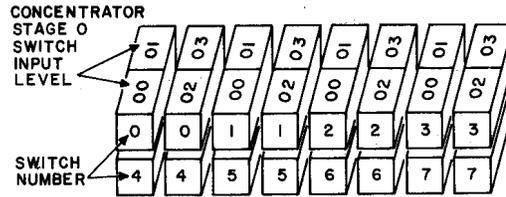
FERRODS FOR
CONCENTRATOR O
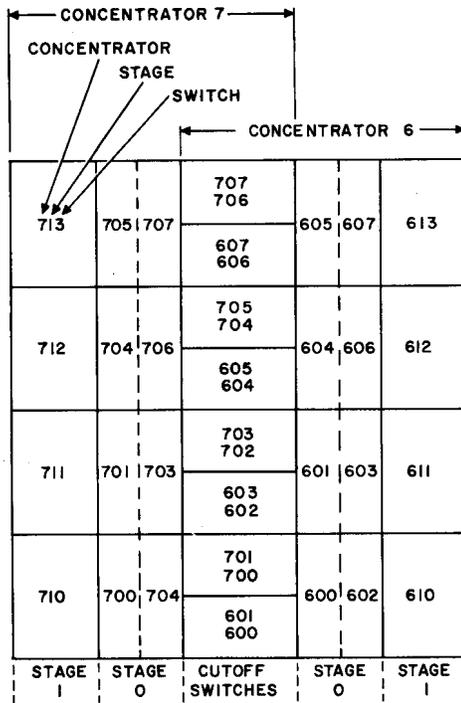
FERREED AND CUTOFF
SWITCH ASSEMBLY

242E AND 241A SWITCHES — TERMINAL LAYOUT
(FRONT VIEW)

FRONT
(HALF OF STAGE O PART OF A CONCENTRATOR)

CONCENTRATOR 4   CONCENTRATOR 5

242E

| 5 |
| 4 |
| |
| 2 |
| 405 407 |
| 0 |
| 9 |
| 8 |
| |
| 6 |
| |
| 4 |
| 404 406 |
| 2 |
| |
| 0 |

TENS DIGIT
UNITS DIGIT

406   407
I o o o o o o o o o
0 o o o o o o o o o
0   7
241A COU

506   507
I o o o o o o o o o
0 o o o o o o o o o
0   7
241A COU

404   405
I o o o o o o o o o
0 o o o o o o o o o
0   7
241A COU

UNITS DIGIT

504   505
I o o o o o o o o o
0 o o o o o o o o o
0   7
241A COU

TENS DIGIT

242E

| 5 |
| 4 |
| |
| 2 |
| 505 507 |
| 0 |
| 9 |
| 8 |
| |
| 6 |
| |
| 4 |
| 504 506 |
| 2 |
| |
| 0 |

242E AND 241A SWITCHES — TERMINAL LAYOUT
(REAR VIEW)

REAR
(HALF OF STAGE 0 PART OF A CONCENTRATOR)
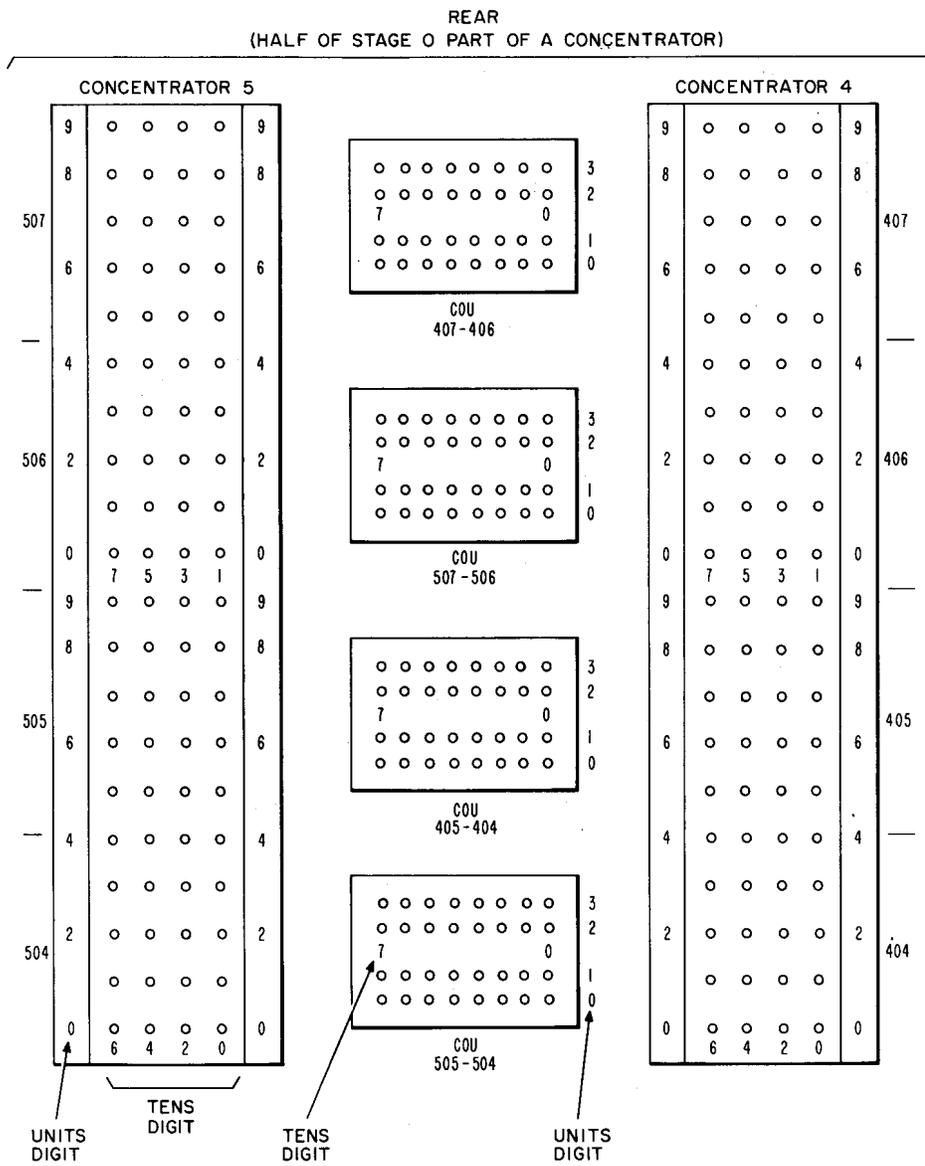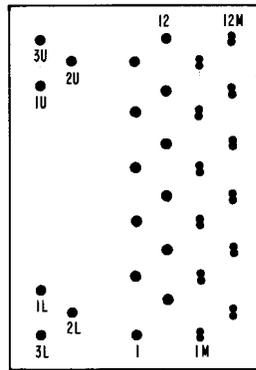
242A SWITCH-TERMINAL LAYOUT
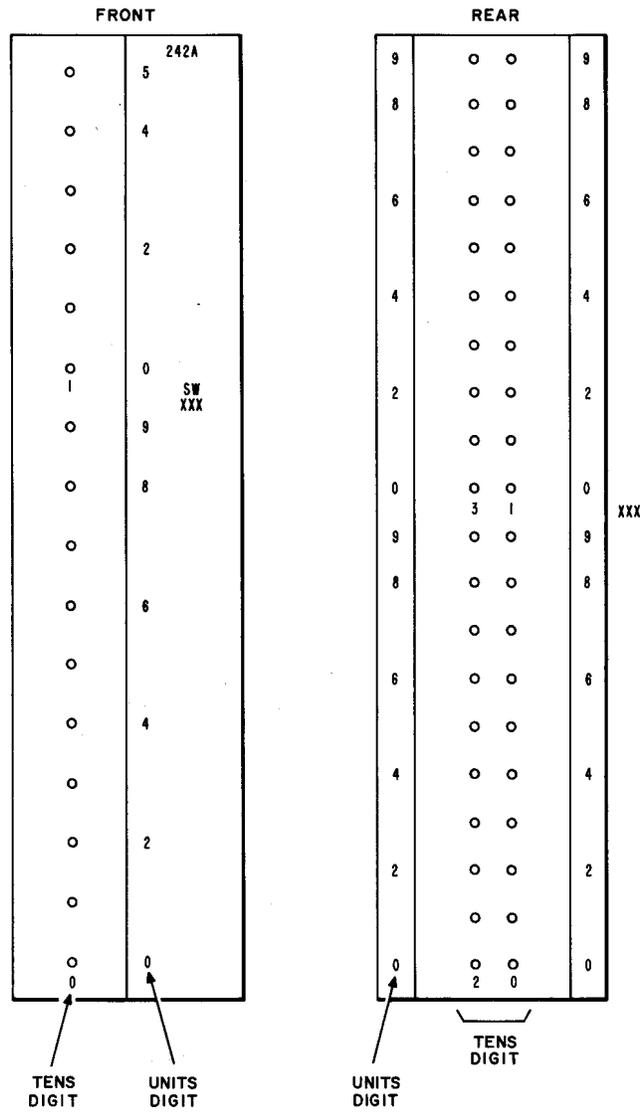
**AF-, AG-, AJ-, AND AL-TYPE RELAYS —
12-POSITION**
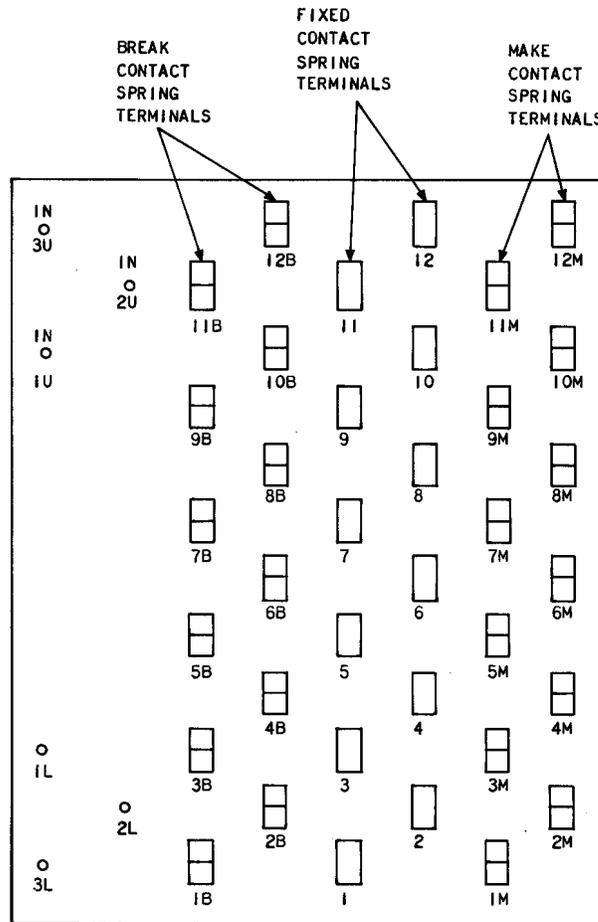
**Winding and Spring Terminal Arrangement
As Viewed From the Rear (Terminal Side)**

AJ-TYPE RELAY WIREWRAP TERMINALS —
12-POSITION

REAR VIEW
AJ-522

SAME AS
AJ-522

REAR VIEW
AJ-525

12 CONTACT RELAYS

AJ-TYPE RELAY WIREWRAP TERMINALS —
24-POSITION
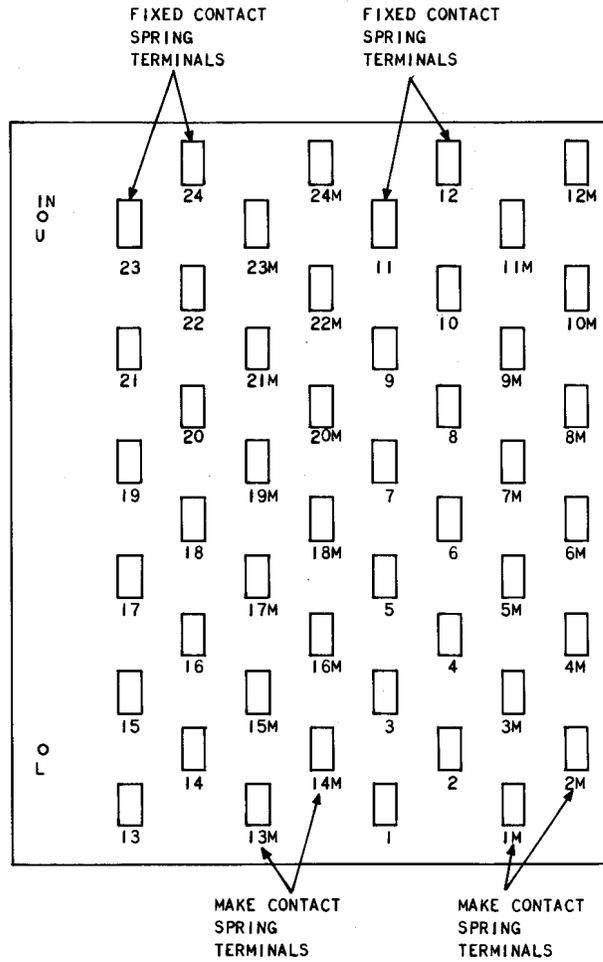
FIXED CONTACT
SPRING
TERMINALS

FIXED CONTACT
SPRING
TERMINALS

IN
O
U

O
L

MAKE CONTACT
SPRING
TERMINALS

MAKE CONTACT
SPRING
TERMINALS
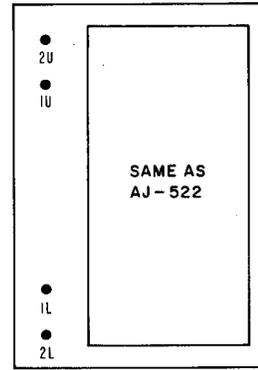
**Winding and Spring Terminal Arrangement
As Viewed From the Rear (Terminal Side)**

AJ-TYPE RELAY — 24-POSITION
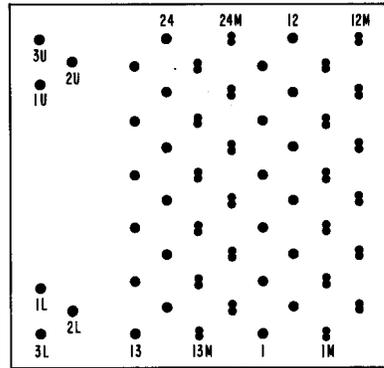
REAR VIEW
AJ-703
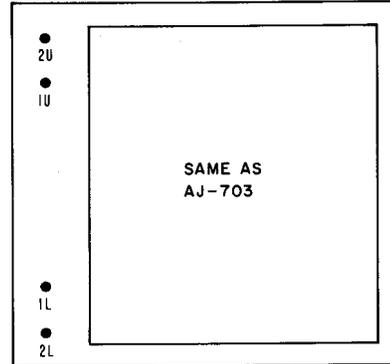
REAR VIEW
AJ-704

24 CONTACT RELAYS

AK- AND AM-TYPE RELAYS
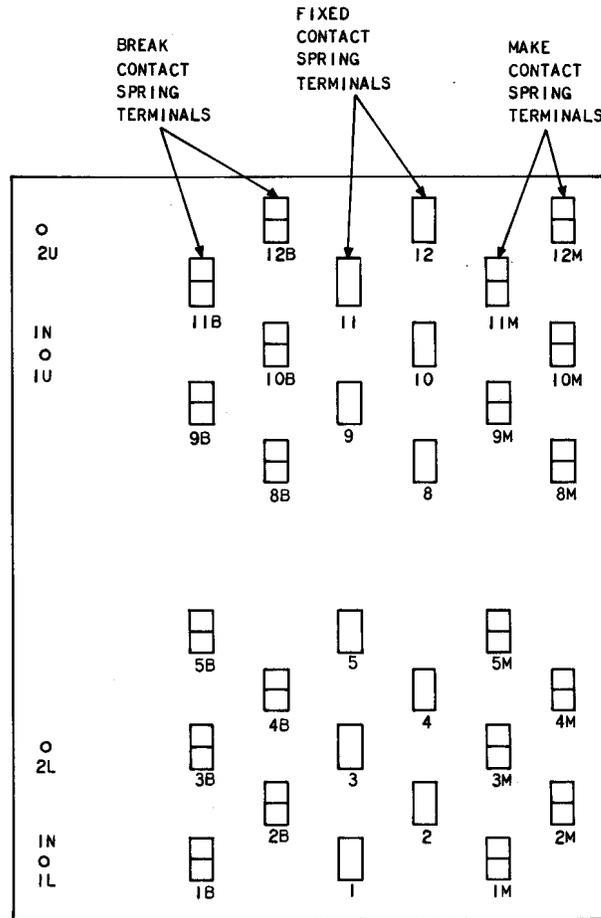
**Winding and Terminal Arrangement As Viewed
From the Rear (Terminal Side)**

MERCURY TYPE RELAYS
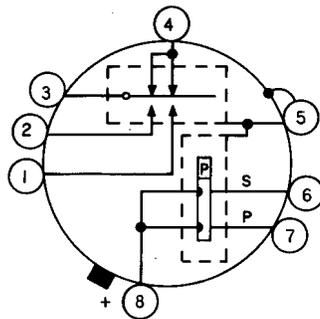
276A- AND 303G-TYPE RELAYS
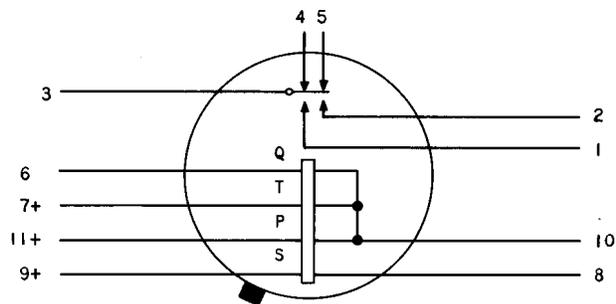
292B-TYPE RELAY
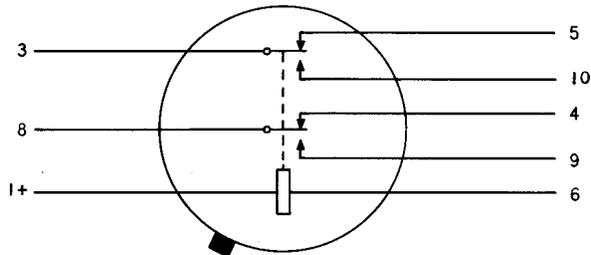
313A-TYPE RELAY

**Winding and Spring Terminal Arrangements
As Viewed From the Base**

NETWORK CONTROL JUNCTOR SWITCHING FRAME

	F SWITCHES	F SWITCHES
BUS TRANSFORMER	SWITCHING GRID 3	SWITCHING GRID 7
SCANNER CONTROL AND LOGIC		FCG/NT SWITCHES
	GRID RELAYS	GRID RELAYS
CONTROL PANEL	F SWITCHES	F SWITCHES
NETWORK LOGIC AND CONTROL	SWITCHING GRID 2	SWITCHING GRID 6
POWER CROSS AND DIAGNOSTIC	F SWITCHES SWITCHING GRID 1	F SWITCHES SWITCHING GRID 5
ORDER AND GRID RELAYS		FCG/NT SWITCHES
	GRID RELAYS	GRID RELAYS
PULSER PULSER	F SWITCHES SWITCHING GRID 0	F SWITCHES SWITCHING GRID 4
FUSE PANEL		
0	1	2
FILTER PAN	FILTER PAN	

FERREED AND F
SWITCH ASSEMBLY

F	40	41	42	43	44	45	46	47
STAGE 0	400	401	402	403	404	405	406	407
STAGE 1	410	411	412	413	414	415	416	417

GRID   SWITCH

STAGE

OCTAL-DECIMAL CONVERSION

000
to
377

(oct)

000
to
255

(dec)

X =	0	1	2	3	4	5	6	7
000X	0000	0001	0002	0003	0004	0005	0006	0007
001X	0008	0009	0010	0011	0012	0013	0014	0015
002X	0016	0017	0018	0019	0020	0021	0022	0023
003X	0024	0025	0026	0027	0028	0029	0030	0031
004X	0032	0033	0034	0035	0036	0037	0038	0039
005X	0040	0041	0042	0043	0044	0045	0046	0047
006X	0048	0049	0050	0051	0052	0053	0054	0055
007X	0056	0057	0058	0059	0060	0061	0062	0063
010X	0064	0065	0066	0067	0068	0069	0070	0071
011X	0072	0073	0074	0075	0076	0077	0078	0079
012X	0080	0081	0082	0083	0084	0085	0086	0087
013X	0088	0089	0090	0091	0092	0093	0094	0095
014X	0096	0097	0098	0099	0100	0101	0102	0103
015X	0104	0105	0106	0107	0108	0109	0110	0111
016X	0112	0113	0114	0115	0116	0117	0118	0119
017X	0120	0121	0122	0123	0124	0125	0126	0127
020X	0128	0129	0130	0131	0132	0133	0134	0135
021X	0136	0137	0138	0139	0140	0141	0142	0143
022X	0144	0145	0146	0147	0148	0149	0150	0151
023X	0152	0153	0154	0155	0156	0157	0158	0149
024X	0160	0161	0162	0163	0164	0165	0166	0167
025X	0168	0169	0170	0171	0172	0173	0174	0175
026X	0176	0177	0178	0179	0180	0181	0182	0183
027X	0184	0185	0186	0187	0188	0189	0190	0191
030X	0192	0193	0194	0195	0196	0197	0198	0199
031X	0200	0201	0202	0203	0204	0205	0206	0207
032X	0208	0209	0210	0211	0212	0213	0214	0215
033X	0216	0217	0218	0219	0220	0221	0222	0223
034X	0224	0225	0226	0227	0228	0229	0230	0231
035X	0232	0233	0234	0235	0236	0237	0238	0239
036X	0240	0241	0242	0243	0244	0245	0246	0247
037X	0248	0249	0250	0251	0252	0253	0254	0255

OCTAL-DECIMAL CONVERSION (Cont)

	400 to 777 (oct)	256 to 511 (dec)

X =	0	1	2	3	4	5	6	7
040X	0256	0257	0258	0259	0260	0261	0262	0263
041X	0264	0265	0266	0267	0268	0269	0270	0271
042X	0272	0273	0274	0275	0276	0277	0278	0279
043X	0280	0281	0282	0283	0284	0285	0286	0287
044X	0288	0289	0290	0291	0292	0293	0294	0295
045X	0296	0297	0298	0299	0300	0301	0302	0303
046X	0304	0305	0306	0307	0308	0309	0310	0311
047X	0312	0313	0314	0315	0316	0317	0318	0319
050X	0320	0321	0322	0323	0324	0325	0326	0327
051X	0328	0329	0330	0331	0332	0333	0334	0335
052X	0336	0337	0338	0339	0340	0341	0342	0343
053X	0344	0345	0346	0347	0348	0349	0350	0351
054X	0352	0353	0354	0355	0356	0357	0358	0359
055X	0360	0361	0362	0363	0364	0365	0366	0367
056X	0368	0369	0370	0371	0372	0373	0374	0375
057X	0376	0377	0378	0379	0380	0381	0382	0383
060X	0384	0385	0386	0387	0388	0389	0390	0391
061X	0392	0393	0394	0395	0396	0397	0398	0399
062X	0400	0401	0402	0403	0404	0405	0406	0407
063X	0408	0409	0410	0411	0412	0413	0414	0415
064X	0416	0417	0418	0419	0420	0421	0422	0423
065X	0424	0425	0426	0427	0428	0429	0430	0431
066X	0432	0433	0434	0435	0436	0437	0438	0439
067X	0440	0441	0442	0443	0444	0445	0446	0447
070X	0448	0449	0450	0451	0452	0453	0454	0455
071X	0456	0457	0458	0459	0460	0461	0462	0463
072X	0464	0465	0466	0467	0468	0469	0470	0471
073X	0472	0473	0474	0475	0476	0477	0478	0479
074X	0480	0481	0482	0483	0484	0485	0486	0487
075X	0488	0489	0490	0491	0492	0493	0494	0495
076X	0496	0497	0498	0499	0500	0501	0502	0503
077X	0504	0505	0506	0507	0508	0509	0510	0511

OCTAL-DECIMAL CONVERSION (Cont)

1000	512
to	to
1377	767
(oct)	(dec)

X =	0	1	2	3	4	5	6	7
100X	0512	0513	0514	0515	0516	0517	0518	0519
101X	0520	0521	0522	0523	0524	0525	0526	0527
102X	0528	0529	0530	0531	0532	0533	0534	0535
103X	0536	0537	0538	0539	0540	0541	0542	0543
104X	0544	0545	0546	0547	0548	0549	0550	0551
105X	0552	0553	0554	0555	0556	0557	0558	0559
106X	0560	0561	0562	0563	0564	0565	0566	0567
107X	0568	0569	0570	0571	0572	0573	0574	0575
110X	0576	0577	0578	0579	0580	0581	0582	0583
111X	0584	0585	0586	0587	0588	0589	0590	0591
112X	0592	0593	0594	0595	0596	0597	0598	0599
113X	0600	0601	0602	0603	0604	0605	0606	0607
114X	0608	0609	0610	0611	0612	0613	0614	0615
115X	0616	0617	0618	0619	0620	0621	0622	0623
116X	0624	0625	0626	0627	0628	0629	0630	0631
117X	0632	0633	0634	0635	0636	0637	0638	0639
120X	0640	0641	0642	0643	0644	0645	0646	0647
121X	0648	0649	0650	0651	0652	0653	0654	0655
122X	0656	0657	0658	0659	0660	0661	0662	0663
123X	0664	0665	0666	0667	0668	0669	0670	0671
124X	0672	0673	0674	0675	0676	0677	0678	0679
125X	0680	0681	0682	0683	0684	0685	0686	0687
126X	0688	0689	0690	0691	0692	0693	0694	0695
127X	0696	0697	0698	0699	0700	0701	0702	0703
130X	0704	0705	0706	0707	0708	0709	0710	0711
131X	0712	0713	0714	0715	0716	0717	0718	0719
132X	0720	0721	0722	0723	0724	0725	0726	0727
133X	0728	0729	0730	0731	0732	0733	0734	0735
134X	0736	0737	0738	0739	0740	0741	0742	0743
135X	0744	0745	0746	0747	0748	0749	0750	0751
136X	0752	0753	0754	0755	0756	0757	0758	0759
137X	0760	0761	0762	0763	0764	0765	0766	0767

OCTAL-DECIMAL CONVERSION (Cont)

<table>
<tr><td>1400
to
1777

(oct)</td><td>768
to
1023

(dec)</td></tr>
</table>

X =	0	1	2	3	4	5	6	7
140X	0768	0769	0770	0771	0772	0773	0774	0775
141X	0776	0777	0778	0779	0780	0781	0782	0783
142X	0784	0785	0786	0787	0788	0789	0790	0791
143X	0792	0793	0794	0795	0796	0797	0798	0799
144X	0800	0801	0802	0803	0804	0805	0806	0807
145X	0808	0809	0810	0811	0812	0813	0814	0815
146X	0816	0817	0818	0819	0820	0821	0822	0821
147X	0824	0825	0826	0827	0828	0829	0830	0831
150X	0832	0833	0834	0835	0836	0837	0838	0839
151X	0840	0841	0842	0843	0844	0845	0846	0847
152X	0848	0849	0850	0851	0852	0853	0854	0855
153X	0856	0857	0858	0859	0560	0861	0862	0865
154X	0864	0865	0866	0867	0868	0869	0879	0871
155X	0872	0873	0874	0875	0876	0877	0878	0879
156X	0880	0881	0882	0883	0884	0885	0886	0887
157X	0888	0889	0890	0891	0892	0893	0894	0895
160X	0896	0897	0898	0899	0900	0901	0902	0903
161X	0903	0905	0906	0907	0908	0909	0910	0911
162X	0912	0913	0914	0915	0916	0917	0918	0919
163X	0920	0921	0922	0923	0924	0925	0926	0927
164X	0928	0929	0930	0931	0932	0933	0934	0935
165X	0936	0937	0938	0939	0940	0941	0942	0943
166X	0944	0945	0946	0947	0948	0949	0950	0951
167X	0952	0953	0954	0955	0956	0957	0958	0959
170X	0960	0961	0962	0963	0964	0965	0966	0967
171X	0968	0969	0970	0971	0972	0973	0974	0975
172X	0976	0977	0978	0979	0980	0981	0982	0983
173X	0984	0985	0986	0987	0988	0989	0990	0991
174X	0992	0993	0994	0995	0996	0997	0998	0999
175X	1000	1001	1002	1003	1004	1005	1006	1007
176X	1008	1009	1010	1011	1012	1013	1014	1015
177X	1016	1017	1018	1019	1020	1021	1022	1023

NUMBERS FREQUENTLY CALLED

NAME	TEL NO.

NOTES

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