

CERN

EP-ELECTRONICS
RESEARCH & DEVELOPMENT GROUP

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CRATE ENCODER, TYPES 7236 and 7236A

TECHNICAL SPECIFICATIONS

The Crate Encoder (CE) is designed to read-out data from receiver-memory-hybrid modules (RMH), types 4236¹⁾ and 4248²⁾, or from Plessey modules, types DR32-02³⁾. A functional block diagram is given in Fig. 1. It is housed in a special crate, RMH-crate⁴⁾, type 199. It occupies stations 23 and 24. Only RMH containing data are addressed and transfer their data pattern (Fig. 2) via the dataway to CE. CE completes these data patterns with the encoded station address and crate address to the format used on the branch - vertical dataway - (Fig. 3). A general description of the read-out system can be found in ref. 5.

The enabling of data transfer onto the branch is accomplished by the presence of the enable input signal (EI) on the branch input (BI) connector. If all RMHs (stations) containing data have transferred their pattern, the enable output signal (EO) arrives at the branch output (BO) connector, disables the present active CE and enables the next CE in the branch (EO is connected to EI of the next CE via the branch cable).

The data pattern - containing hit wires, upper half and flag bit (pulses) - is accompanied by a strobe signal; station address and crate address are stable before the data pulses are sent. Data transfer on the branch is controlled by the system encoder module (SE)⁶⁾, type 158. A front panel switch (ON-line) enables the data transfer from the CE onto the branch (7236A only).

1. INPUT

Branch Input connector: p.c.b. edge connector, 2x35 contacts, $\frac{1}{10}$ " pitch, ECL signals (single ended driven, other wire of pair statically -1,4 V; EIF and EI are driven push-pull).
Connections: see Fig. 4.

2. OUTPUT

Branch Output connector: p.c.b. edge connector, 2x35 contacts, $\frac{1}{10}$ " pitch, ECL signals (single ended driven, other wire of pair statically at -1,4 V; EO and EIF are driven push-pull).
Connections: see Fig. 4.

3. CONTROL

Front panel

3.1 Crate Address switch: can be set to desired crate address (1 to 16); rotary hexadecimal type.

3.2 On-line switch: enables or disables the read-out from CE and its crate; toggle type switch (7236A only).

3.3 On-line indicator: indicates the status of the CE; red LED (7236A only).

4. DATAWAY CONNECTIONS (RMH-Crate): p.c.b. edge connectors, 2x43 contacts, $\frac{1}{10}$ " pitch. All signals ECL compatible.
Connections: see Fig. 5.

5. MECHANICS: CAMAC mechanics, 2 units wide.

6. POWER SUPPLY: -5,2 V/3,5 Amps.

7. REMARK

The instrument is not compatible with the standard CAMAC data-way. Insertion into a CAMAC crate may damage both the instrument and the CAMAC dataway.

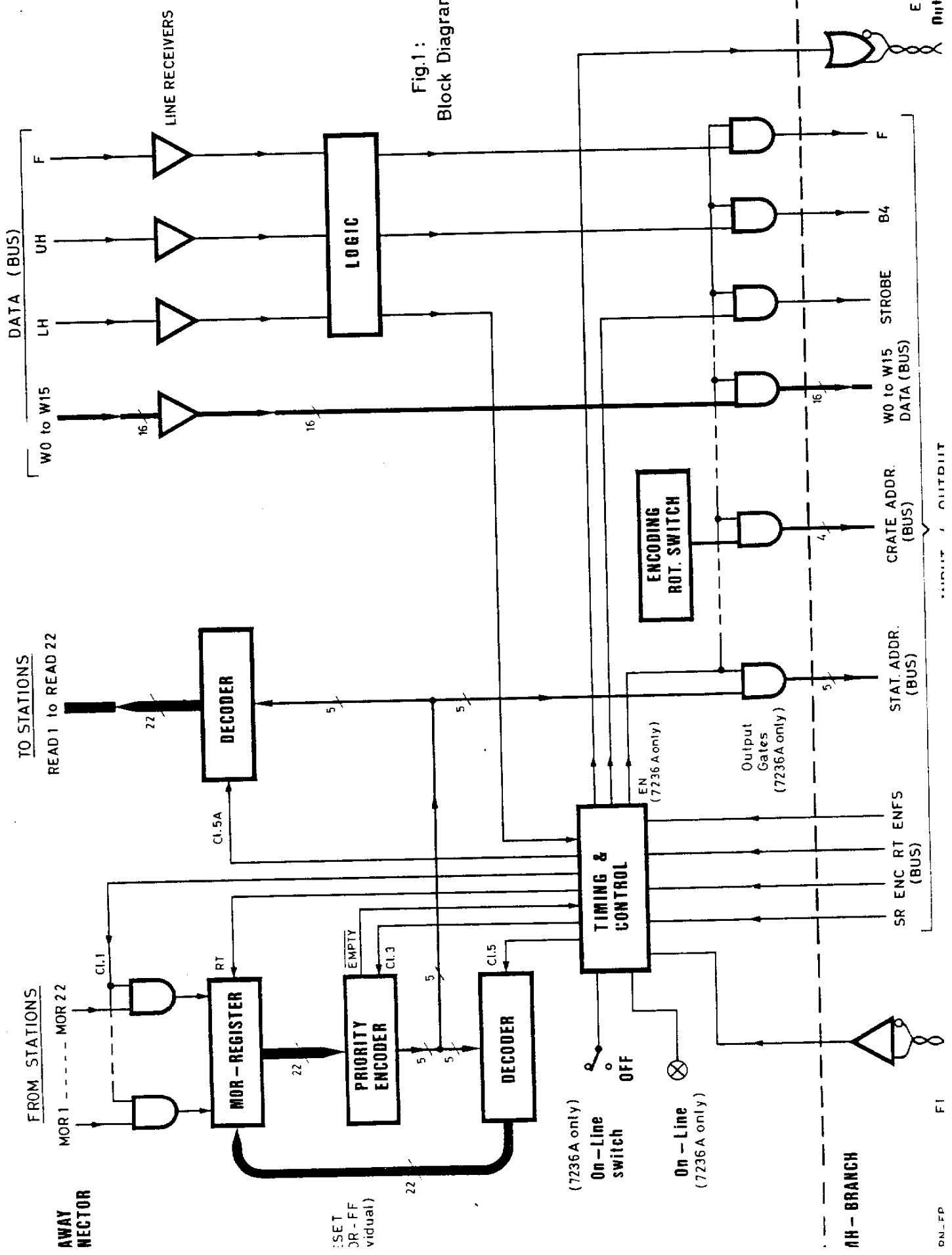
REFERENCES

1. J.C. Tarle and H. Verweij, RMH module, type 4236, Technical specifications, CERN, EP Division (1975).
2. J.C. Tarle and H. Verweij, RMH module 24 channels, type 4248, Technical specifications, CERN, EP Division (1977).
3. Plessey module, type DR32-02, Technical specifications, to be published.
4. C. Millerin, F. Soso and J.C. Tarle, Powered Crate, type 199, Technical specifications, CERN, EP Division (1978).
5. J.B. Lindsay, C. Millerin, J.C. Tarle, H. Verweij and H. Wendler, A fast and flexible data acquisition system for multiwire proportional chambers and other detectors, Proceedings of the Wire Chamber Conference, Vienna, Nucl. Instr. and Meth., 156 (1978).
6. H. Wendler, System encoder, type 158, Technical specifications, CERN, EP Division (1979).

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LIST OF ABBREVIATIONS

BI	Branch input
BO	Branch output
BR	Branch receiver (module)
BT	Branch terminator (plug)
BO	Bit 0
B4	Bit 4
CE	Crate encoder (module)
CL.1	Clock 1 (internal)
CI	Chamber interface (module)
CO	Crate Address bit 0
DF	Device flag (handshake signal, response)
DO	Data output
ECL	Emitter coupled logic
ED	External device
EI	Enable input ("daisy" chain signal)
EIF	Enable input "first" (signal to "first" crate encoder)
ENC	Encode (handshake signal; request)
ENCSE	Encode from system encoder
ENFS	Enable fast strobe
EO	Enable output ("daisy" chain signal)
EOR	End of read-out (end of record)
ERR	Error
F	Flag bit
FF	Flip-flop (bistable)
FO	Fan out (module)
IF	Interface (module)
IIB	Internal input bus
IOB	Internal output bus
IRR	Initialise re-read
LC	Level converter (module)
LH	Lower half (of data pattern)
LSB	Least significant bit
MOR	Memory OR
MSB	Most significant bit
OP	Operational
PAR	Parallel
p.c.b.	Printed circuit board (p.c. board)
RD	Read
RMH	Receiver & memory on hybrid
RT	Reset
SE	System encoder (module)
SR	Start read system encoder (module)
SO	Station address bit 0
UH	Upper half (of data pattern)
WCI	Wire chamber interface (module)
WO	Wire number 0 (uncoded)



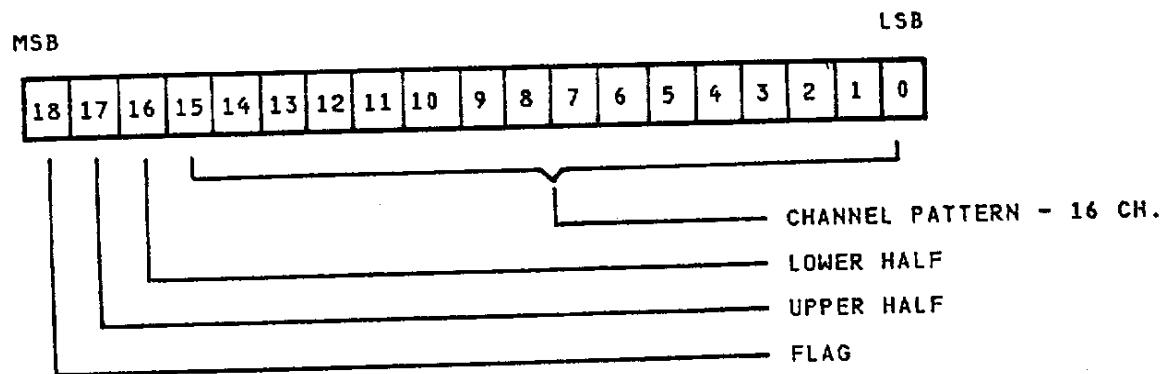


FIG. 2 DATAWAY PATTERN

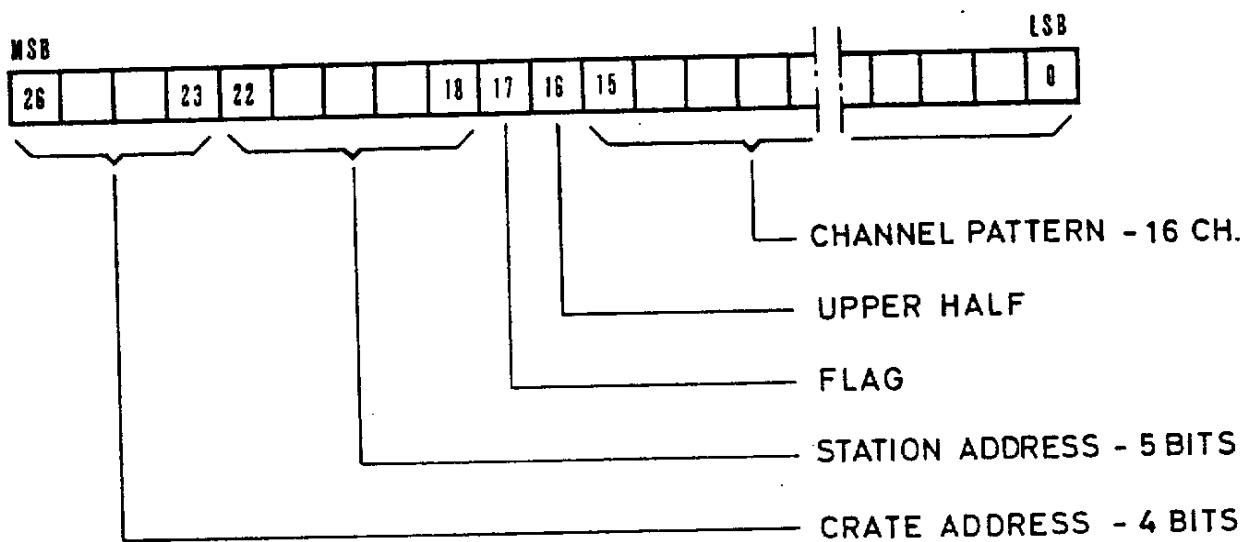


Fig. 3 BRANCH FORMAT

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BRANCH OUTPUT CONNECTOR

<u>Component side</u>	<u>Solder side</u>
EO	- 1 -
ENFS	- 2 -
CO	- 3 -
C1	- 4 -
C2	- 5 -
C3	- 6 -
SO	- 7 -
S1	- 8 -
S2	- 9 -
S3	- 10 -
S4	- 11 -
SR	- 12 -
ENCSE	- 13 -
RT	- 14 -
STROBE	- 15 -
EIF	- 16 -
F	- 17 -
B4	- 18 -
W0	- 19 -
W1	- 20 -
W2	- 21 -
W3	- 22 -
W4	- 23 -
W5	- 24 -
W6	- 25 -
W7	- 26 -
W8	- 27 -
W9	- 28 -
W10	- 29 -
W11	- 30 -
W12	- 31 -
W13	- 32 -
W14	- 33 -
W15	- 34 -
-5,2 V	- 35 -

EO

EIF

GND

Return (-1,4 V)

Return (-1,4 V)

BRANCH INPUT CONNECTOR

<u>Component side</u>	<u>Solder side</u>
E1	- 1 -
ENFS	- 2 -
CO	- 3 -
C1	- 4 -
C2	- 5 -
C3	- 6 -
SO	- 7 -
S1	- 8 -
S2	- 9 -
S3	- 10 -
S4	- 11 -
SR	- 12 -
ENCSE	- 13 -
RT	- 14 -
STROBE	- 15 -
EIF	- 16 -
F	- 17 -
B4	- 18 -
W0	- 19 -
W1	- 20 -
W2	- 21 -
W3	- 22 -
W4	- 23 -
W5	- 24 -
W6	- 25 -
W7	- 26 -
W8	- 27 -
W9	- 28 -
W10	- 29 -
W11	- 30 -
W12	- 31 -
W13	- 32 -
W14	- 33 -
W15	- 34 -
-5,2 V	- 35 -

EI

Return (-1,4 V)

EIF

Return (-1,4 V)

GND

FIG. 4

BRANCH INPUT AND BRANCH OUTPUT CONNECTIONS
viewed from front panel

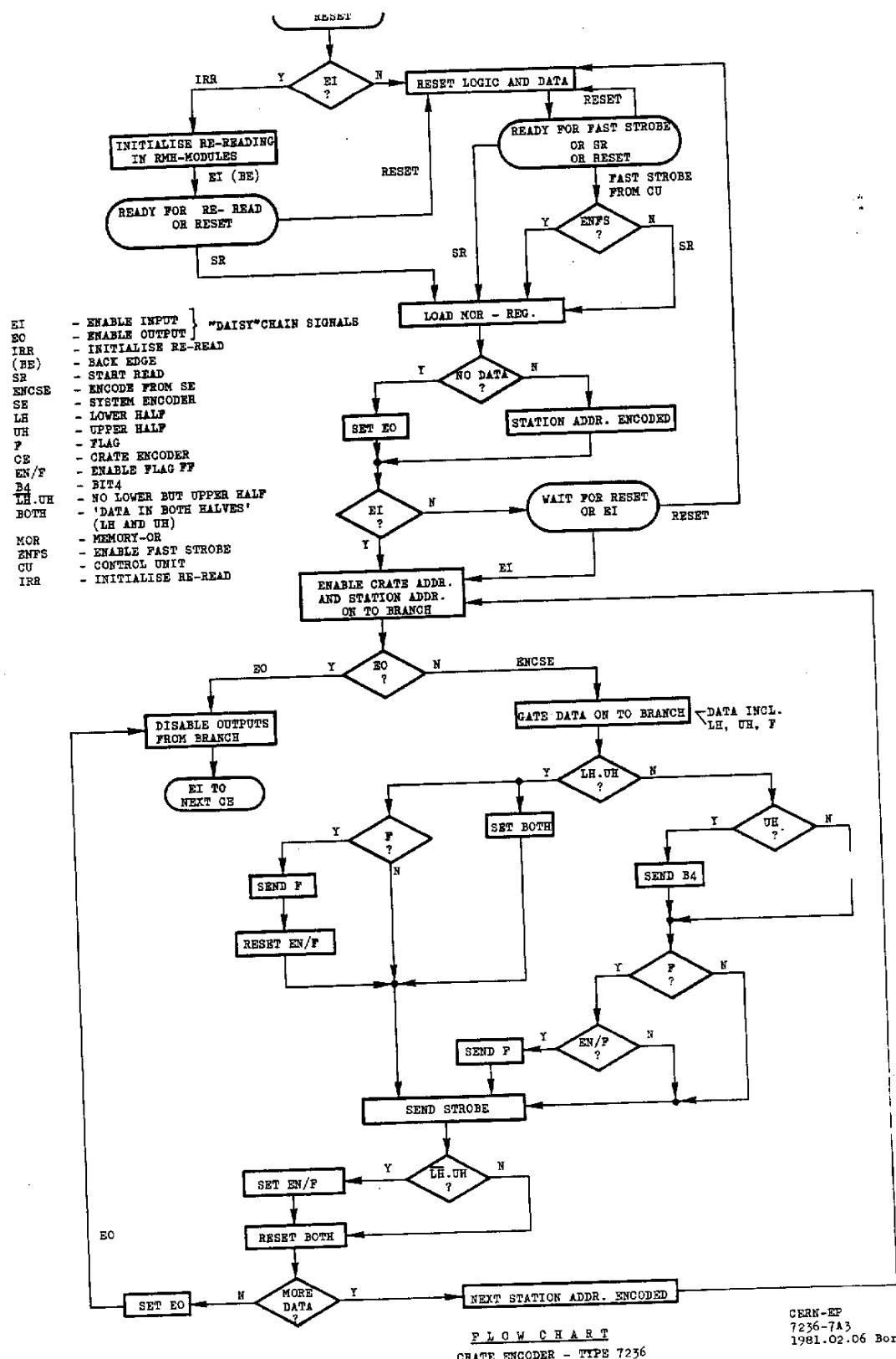
Card W (Station 23)

DATA	0	1	-2V
"	1	2	"
"	2	3	"
"	3	4	"
"	4	5	"
"	5	6	"
"	6	7	"
"	7	8	"
"	8	9	"
"	9	10	"
"	10	11	"
"	11	12	"
"	12	13	"
"	13	14	"
"	14	15	"
"	15	16	"
"	LH	17	"(LH=lower half)
"	UH	18	"(UH=upper half)
"	FLAG	19	"
-2 V	20	"	
FREE	21	FREE	
"	22	"	
RESET IN	23	-2V	
FREE	24	FREE	
"	25	"	
"	26	"	
"	27	"	
"	28	"	
"	29	"	
"	30	"	
"	31	"	
"	32	"	
"	33	"	
"	34	"	
"	35	"	
"	36	"	
"	37	"	
"	38	"	
"	39	"	
-5,2V	40	"	
FREE	41	"	
-5,2V	42	"	
GND	43	GND	

Card MOR (Station 24)

FREE	1	FREE	
"	2	"	
"	3	"	
"	4	"	
"	5	"	
"	6	"	
STROBE(+)	7	STROBE(-)	
-2V	8	RESET OUT	
"	9	-2V	
RD	10	RD 2 (RD=read)	
"	11	" 4	
"	12	" 6	
"	13	" 8	
"	14	" 10	
"	15	" 12	
"	16	" 14	
"	17	" 16	
"	18	" 18	
"	19	" 20	
"	20	" 22	
FREE	21	FREE	
"	22	- 2V	
RESET IN	23	"	
"	24	"	
"	25	"	
MOR	1	MOR 2	
"	26	" 4	
"	27	" 6	
"	28	" 8	
"	29	" 10	
"	30	" 12	
"	31	" 14	
"	32	" 16	
"	33	" 18	
"	34	" 20	
"	35	" 22	
"	36	"	
"	37	FREE	
IRR	38	- 2V (IRR=Initialize re-read)	
FREE	39	FREE	
"	40	"	
FREE	41	"	
"	42	"	
GND	43	GND	

FIG. 5
DATAWAY CONNECTIONS
viewed from front panel



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FLOW CHART
 CRATE ENCODER - TYPE 7236