Instrumentation Laboratory
Massachusetts Institute of Technology
Cambridge, Massachusetts

Digital Development Memo #234

To: Eldon Hall
From: Albert Hopkins
Subj: Tabulation of Block II Rope Addresses
Date: 9 February 1965

Attached is a table relating various descriptors of rope address. These descriptors are tabulated as follows:

a) Substrand: This is a group of sixteen wires through one side (256 cores) of a module, and contains 256 words (400 octal). Each module contains twelve substrands. Location is represented by four characters. The first is a digit (1 through 6) denoting module. The next is a letter (A or B) denoting side of a module. The last two are decimal digits (01 through 12) denoting wire group or strand. For elaboration see Raytheon Memo WFZ-G116 to V. White from W. Zantow, 1 October 1964. Substrands range from 1A01 through 6B12.

b) FMA or Fixed CADR: This is a form of octal address used in the fixed memory selection logic of the AGC II, as described in Digital Development Memo #219. It is also used in AGC II programs as complete address, or CADR, for all of fixed memory except FIXED-FIXED, or FMA's 4000-7777. The FMA ranges from 0 to 107777. The number in the FMA column of the accompanying table is the FMA of the first word in the substrand.

c) Bank, FEB, and S: A bank is 1024 words, or four consecutive substrands. The fixed extension bits (FEB) resolve an ambiguity in banks 30-37. In general, a word is accessed by setting the BANK bits (via FBANK or BBANK) and the FEB (via Channel 7) to the desired configuration and reading an address in the range 2000-3777. (Note that this is a change from Block I.) Most banks are independent of the FEB, and these are indicated by an X in the table signifying "don't care." The bank number is listed with the first of the four substrands it contains.

FIXED-FIXED memory can also be read via addresses 4000-7777 irrespective of bank register contents; this is indicated in the table by the bracketed entries. The column labeled S contains the machine (S register) address of the first word in the substrand.

d) Pseudo-address: This is an octal address used by the YUL assembly system, and is defined in AGC 4 Memo #8, "Block II Instructions, Revised," by Hugh Blair-Smith, 17 September 1964. The first pseudo-address of each substrand is listed in the table.

e) Paragraph: A paragraph is a YUL-oriented word for the information wired into a substrand. Its numbering scheme is geared to the pseudo-address rather than the physical location, which is one major reason for the issuance of this table.

Substrand module strand	Fixed CADR* or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
1A01	0	00	X	2000	10000	20
1B01	400			2400	10400	21
1A02	1000			3000	11000	22
1B02	1400			3400	11400	23
1A03	2000	01	X	2000	12000	24
1B03	2400			2400	12400	25
1A04	3000			3000	13000	26
1B04	3400			3400	13400	27
1A05	4000*	02	X	2000	04000	10
		X	X	4000		
1B05	4400*			2400	04400	11
				4400		
1A06	5000*			3000	05000	12
				5000		
1B06	5400*			3400	05400	13
				5400		
1A07	6000*	03	X	2000	06000	14
		X	X	6000		
1B07	6400*			2400	06400	15
				6400		
1A08	7000*			3000	07000	16
				7000		
1B08	7400*			3400	07400	17
				7400		
1A09	10000	04	X	2000	20000	40
1B09	10400			2400	20400	41
1A10	11000			3000	21000	42
1B10	11400			3400	21400	43

* fixed CADR not defined for paragraphs 10 - 17.

Substrand module strand	Fixed CADR or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
1A11	12000	05	X	2000	22000	44
1B11	12400			2400	22400	45
1A12	13000			3000	23000	46
1B12	13400			3400	23400	47
2A01	14000	06	X	2000	24000	50
2B01	14400			2400	24400	51
2A02	15000			3000	25000	52
2B02	15400			3400	25400	53
2A03	16000	07	X	2000	26000	54
2B03	16400			2400	26400	55
2A04	17000			3000	27000	56
2B04	17400			3400	27400	57
2A05	20000	10	X	2000	30000	60
2B05	20400			2400	30400	61
2A06	21000			3000	31000	62
2B06	21400			3400	31400	63
2A07	22000	11	X	2000	32000	64
2B07	22400			2400	32400	65
2A08	23000			3000	33000	66
2B08	23400			3400	33400	67
2A09	24000	12	X	2000	34000	70
2B09	24400			2400	34400	71
2A10	25000			3000	35000	72
2B10	25400			3400	35400	73
2A11	26000	13	X	2000	36000	74
2B11	26400			2400	36400	75
2A12	27000			3000	37000	76
2B12	27400			3400	37400	77

Substrand module strand	Fixed CADR or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
3A01	30000	14	X	2000	40000	100
3B01	30400			2400	40400	101
3A02	31000			3000	41000	102
3B02	31400			3400	41400	103
3A03	32000	15	X	2000	42000	104
3B03	32400			2400	42400	105
3A04	33000			3000	43000	106
3B04	33400			3400	43400	107
3A05	34000	16	X	2000	44000	110
3B05	34400			2400	44400	111
3A06	35000			3000	45000	112
3B06	35400			3400	45400	113
3A07	36000	17	X	2000	46000	114
3B07	36400			2400	46400	115
3A08	37000			3000	47000	116
3B08	37400			3400	47400	117
3A09	40000	20	X	2000	50000	120
3B09	40400			2400	50400	121
3A10	41000			3000	51000	122
3B10	41400			3400	51400	123
3A11	42000	21	X	2000	52000	124
3B11	42400			2400	52400	125
3A12	43000			3000	53000	126
3B12	43400			3400	53400	127

Substrand module strand	Fixed CADR or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
4A01	44000	22	X	2000	54000	130
4B01	44400			2400	54400	131
4A02	45000			3000	55000	132
4B02	45400			3400	55400	133
4A03	46000	23	X	2000	56000	134
4B03	46400			2400	56400	135
4A04	47000			3000	57000	136
4B04	47400			3400	57400	137
4A05	50000	24	X	2000	60000	140
4B05	50400			2400	60400	141
4A06	51000			3000	61000	142
4B06	51400			3400	61400	143
4A07	52000	25	X	2000	62000	144
4B07	52400			2400	62400	145
4A08	53000			3000	63000	146
4B08	53400			3400	63400	147
4A09	54000	26	X	2000	64000	150
4B09	54400			2400	64400	151
4A10	55000			3000	65000	152
4B10	55400			3400	65400	153
4A11	56000	27	X	2000	66000	154
4B11	56400			2400	66400	155
4A12	57000			3000	67000	156
4B12	57400			3400	67400	157

Substrand module strand	Fixed CADR or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
5A01	60000	30	0-3	2000	70000	160
5B01	60400			2400	70400	161
5A02	61000			3000	71000	162
5B02	61400			3400	71400	163
5A03	62000	31	0-3	2000	72000	164
5B03	62400			2400	72400	165
5A04	63000			3000	73000	166
5B04	63400			3400	73400	167
5A05	64000	32	0-3	2000	74000	170
5B05	64400			2400	74400	171
5A06	65000			3000	75000	172
5B06	65400			3400	75400	173
5A07	66000	33	0-3	2000	76000	174
5B07	66400			2400	76400	175
5A08	67000			3000	77000	176
5B08	67400			3400	77400	177
5A09	70000	34	0-3	2000	100000	200
5B09	70400			2400	100400	201
5A10	71000			3000	101000	202
5B10	71400			3400	101400	203
5A11	72000	35	0-3	2000	102000	204
5B11	72400			2400	102400	205
5A12	73000			3000	103000	206
5B12	73400			3400	103400	207

Substrand module strand	Fixed CADR or FMA	Bank	FEB	S	Pseudo-Address	Paragraph
6A01	74000	36	0-3	2000	104000	210
6B01	74400			2400	104400	211
6A02	75000			3000	105000	212
6B02	75400			3400	105400	213
6A03	76000	37	0-3	2000	106000	214
6B03	76400			2400	106400	215
6A04	77000			3000	107000	216
6B04	77400			3400	107400	217
6A05	100000	38	4	2000	110000	220
6B05	100400			2400	110400	221
6A06	101000			3000	111000	222
6B06	101400			3400	111400	223
6A07	102000	31	4	2000	112000	224
6B07	102400			2400	112400	225
6A08	103000			3000	113000	226
6B08	103400			3400	113400	227
6A09	104000	32	4	2000	114000	230
6B09	104400			2400	114400	231
6A10	105000			3000	115000	232
6B10	105400			3400	115400	233
6A11	106000	33	4	2000	116000	234
6B11	106400			2400	116400	235
6A12	107000			3000	117000	236
6B12	107400			3400	117400	237