

Input Active Low

- 1 - Analog Lock
- 2 - Failsoft
- 3 - UNUSED
- 4 - CH Reset
- 9 - PTT Contact close

Outputs Active High

- 1 - PL Active
- 2 - DON'T USE (low)
- 3 - Alarm
- 7 - RX COR Relay

Timers

- 1 - Chain Start
- 2 - Chain
- 3 - Chain
- 4 - Chain
- 5 - Chain Stop
- 6 -
- 7 -
- 8 - COS, not ASTRO
- 9 - Mode Lock Holdoff
- 10 - PL Hold off on WL

Event Flags

- 1 - Chan 1 ASTRO with Controller
- 2 - Chan 4 Analog with Controller
- 3 - Chan 5 Analog no Controller
- 4 - Chan 1 Astro no Controller
- 5 - Hold Off with Controller Chan 4
- 6 - Hold Off no Controller Chan 5
- 7 - Hold Off Chan 1
- 8 -
- 9 -
- 10 -
- 11 -
- 12 -
- 13 -
- 14 -
- 15 -
- 16 -

Red Text in wildcard denotes a customer settable value

1 - COS + Audio
 RX Carrier Detect
Action
 Timer 8 - 30ms
Inaction
 Abort Timer 8
 Clr Output 7
 RX Qual Normal

2 - PTT From Wireline
 Input 9 and not Cur Channel 1
Action
 Tx PL enable
 Key from WL
 Abort Timer 10
Inaction
 Tx PL Disable
 Start Timer 10 -5 sec

3 - PL Active
 Rx PL Detect
Action
 Set Output 1
Inaction
 Clr Output 1

4 - Alarm
 Stn Alarm
Action
 Set Output 3
Inaction
 Clr Output 3

5 - RX P25 NO Fail
 RX Astro ID and not Input 2
Action
 Start Timer 9 - 10s
 Abort Timer 1:5
 Set Flag 1
 Set Flag 7
Inaction
 Start Timer 1 - 65s
 Abort Timer 9
 Clear Flag 7

6 - Timer P25 No Fail
 Timer 5 done and Event Flag 1
Action
 Channel 2
 Clear Event Flag 1
Inaction
 Null

7 - Timer 2 > 3
 Timer 2 done
Action
 Timer 3 - 65s
Inaction
 Null

8 - Timer 3 > 4
 Timer 3 done
Action
 Timer 4 - 65s
Inaction
 Null

9 - Timer 4 > 5
 Timer 4 done
Action
 Timer 5 - 65s
Inaction
 Null

10 - RX Analog and No Fail
 RX Analog and not Input 1 and not Input 2
Action
 Start Timer 9 - 10s
 Abort Timer 1:5
 Clear Flag 2
 Set Flag 5
Inaction
 Start Timer 1 - 65s
 Abort Timer 9
 Set Flag 2
 Clear Flag 5

11 - Timer Analog and No Fail
 Timer 5 done and Flag 2
Action
 Chan 2
 Clear Flag 2
Inaction
 Null

12 - Failsoft
 Input 2 and not Input 1
Action
 Chan 3
 Rx PL Enable
 Alarm Tone - 4
Inaction
 Chan 2
 Null
 Alarm Tone off - 4

13 - Analog Failsoft
 Rptr Qual Met and Input 2 and not Cur Chan 1
Action
 Start Timer 9 - 10s
 Abort Timer 1:5
 Clear Flag 3
 Set Flag 6
Inaction
 Start Timer 1 - 65s
 Abort Timer 9
 Set Flag 3
 Clear Flag 6

14 - Timer Analog Fail
 Timer 5 done and Event Flag 3 and not Inpt 1
Action
 Channel 3
 Clear Event Flag 3
Inaction
 Null

15 - RX P25 Failsoft
 RX Astro ID and Input 2
Action
 Start Timer 9 - 10s
 Abort Timer 1:5
 Set Flag 4
 Set Flag 7
Inaction
 Start Timer 1 - 65s
 Abort Timer 9
 Null
 Clear Flag 7

16 - Timer P25 Failsoft
 Timer 5 done and Event Flag 4
Action
 Channel 3
 Clear Event Flag 4
Inaction
 Null

17 - Analog Lock with Controller
 Input 1 and not Input 2
Action
 Channel 4
 Abort Timer 1:5
 Abort Timer 9
 Clear Flag 1:7
Inaction
 Channel 2

18 - Analog Lock Failsoft
 Input 1 and Input 2
Action
 Channel 5
 Abort Timer 1:5
 Abort Timer 9
 Clear Flag 1:7
 Rx PL Enable
 Alarm Tone - 4
Inaction
 Channel 3
 Null

19 - Reset and not Failsoft
 Warm or Cold Reset and not Input 2
Action
 Channel 2
 Abort Timer 1:5
 Clear Flag 1:7
Inaction
 Null

20 - Warm Reset w/controller and Analog Lock
 Warm Reset and Input 1 and not Input 2
Action
 Channel 4
 Abort Timer 1:5
 Clear Flag 1:7
Inaction
 Null

21 - Cold Reset w/controller and Analog Lock
 Cold Reset and Input 1 and not Input 2
Action
 Channel 4
 Abort Timer 1:5
 Clear Flag 1:7
Inaction
 Null

22 - Warm Reset wo/control and Analog Lock
 Warm Reset and Input 1 and Input 2
Action
 Channel 5
 Abort Timer 1:5
 Clear Flag 1:7
 Rx PL Enable
 Alarm Tone - 4
Inaction
 Null
 Alarm Tone off - 4

23 - Cold Reset wo/control and Analog Lock
 Cold Reset and Input 1 and Input 2
Action
 Channel 5
 Abort Timer 1:5
 Clear Flag 1:7
 Rx PL Enable
 Alarm Tone - 4
Inaction
 Null
 Alarm Tone off - 4

24 - PL Hang Timer
 Timer 10 Done
Action
 Dekey from WL
 PL Enable
Inaction
 Null

25 - Analog Ch4 Hold off Timer
 Timer 9 done and flag 5 and not Input 1
Action
 Chan 4
 Clear Flag 5
Inaction
 Null

26 - Analog Ch5 Hold off Timer
 Timer 9 done and flag 6 and not Input 1
Action
 Chan 5
 Clear Flag 6
Inaction
 Null

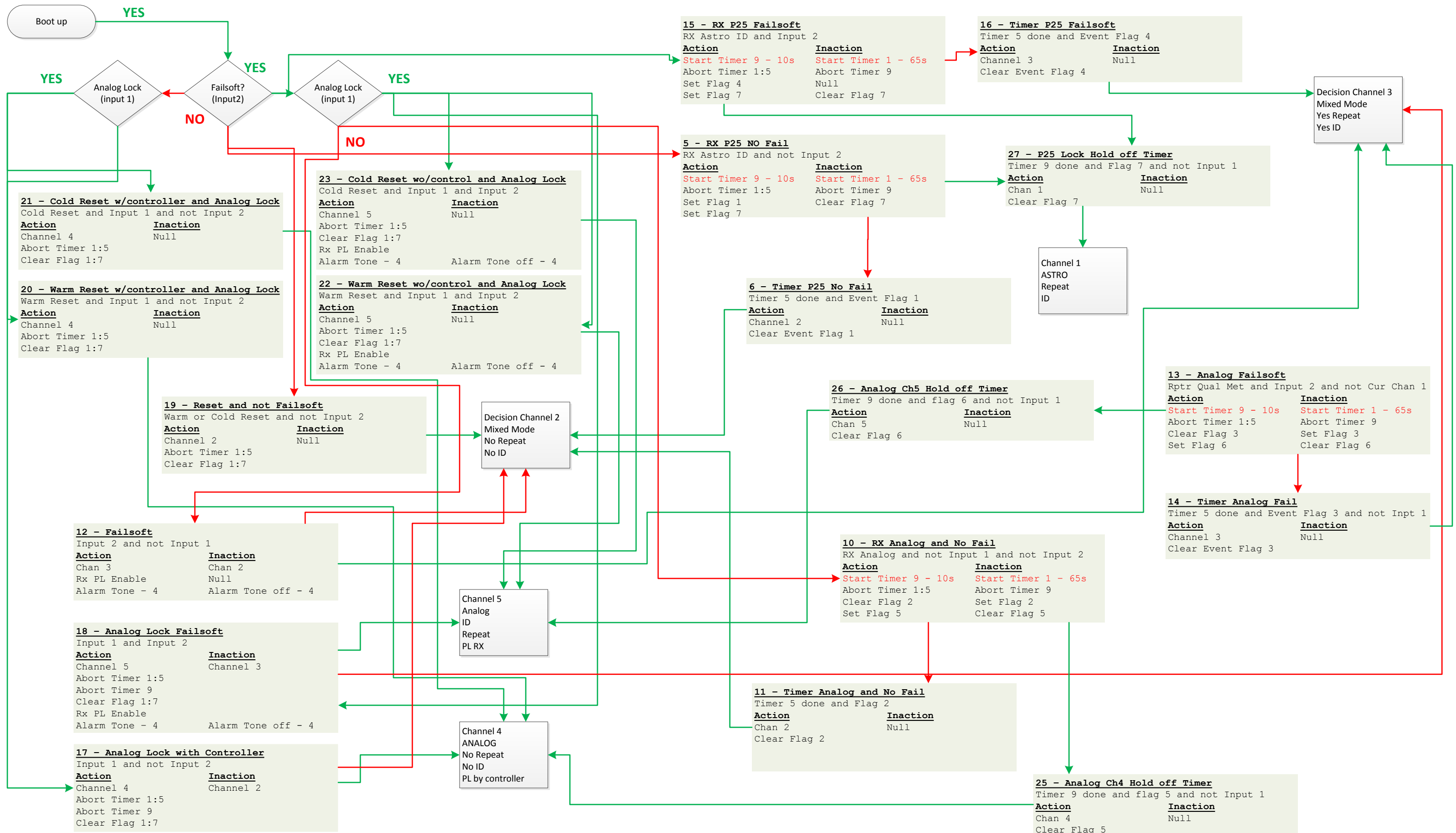
27 - P25 Lock Hold off Timer
 Timer 9 done and Flag 7 and not Input 1
Action
 Chan 1
 Clear Flag 7
Inaction
 Null

28 - COR P25 Hold off
 Timer 8 done and not RX Astro ID and not Chan 1
Action
 Output 7
 RX Qual Force
Inaction
 Null

29 - Chan 2 from controller
 Input 4 and not Input 1 and not Input 2
Action
 Chan 2
Inaction
 Null

30 - Timer 1 > 2
 Timer 1 done
Action
 Timer 2 - 65s
Inaction
 Null

Logical Flow and Wildcard Tables			
SIZE	FSCM NO	DWG NO	REV
DRAWN	9-OCT-2017		4
ISSUED	SCALE 1 : 1	Bryan Fields, W9CR	SHEET 1 OF 5



Logical Routing		SIZE	FSCM NO	DWG NO		REV
DRAWN	9-Oct-2017					2
ISSUED		SCALE	1 : 1	Bryan Fields, W9CR	SHEET	2 OF 5



3 - PL Active
Rx PL Detect
Action
Set Output 1
Inaction
Clr Output 1

4 - Alarm
Stn Alarm
Action
Set Output 3
Inaction
Clr Output 3

29 - Chan 2 from controller
Input 4 and not Input 1 and not Input 2
Action
Chan 2
Inaction
Null

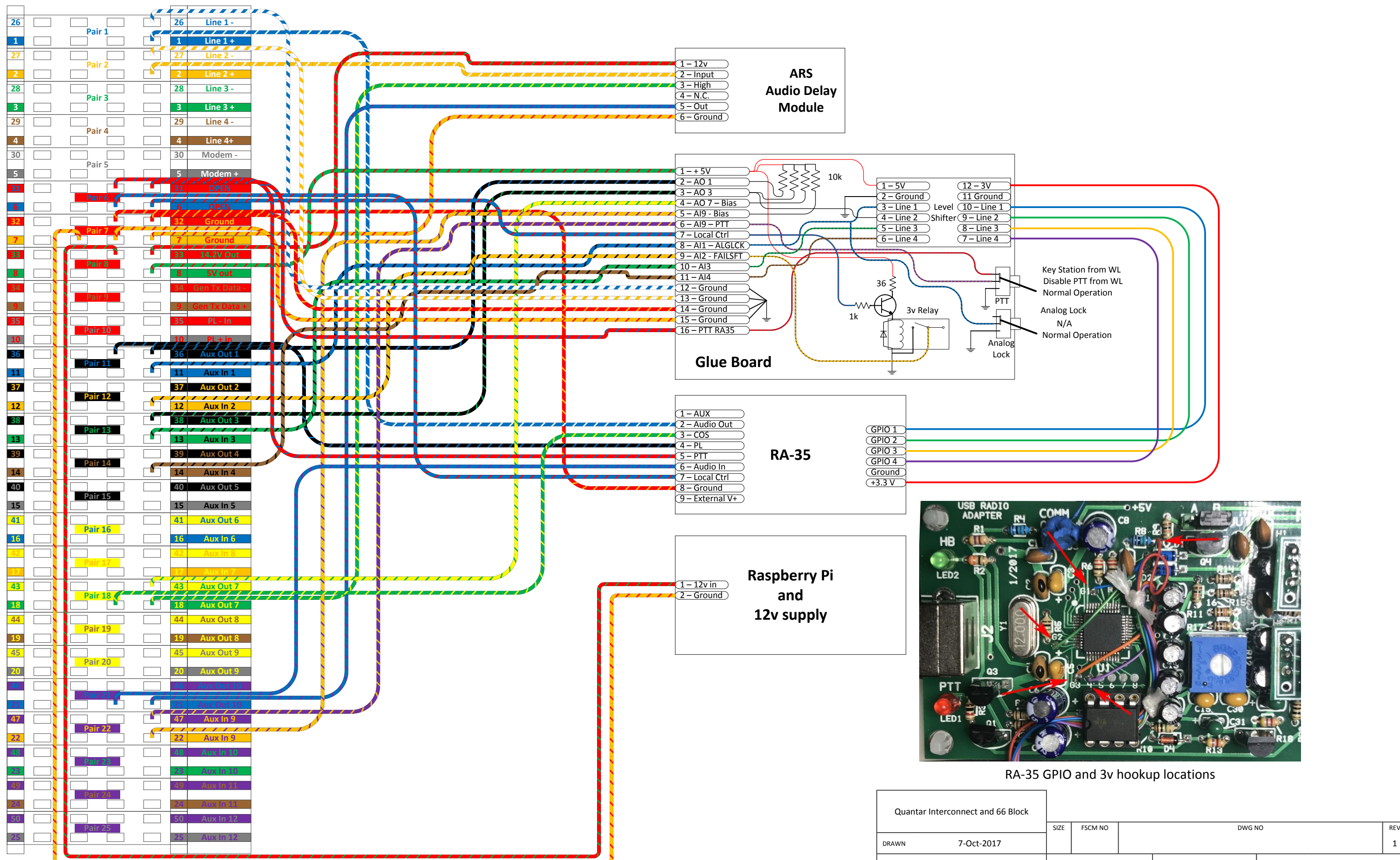
2 - PTT From Wireline
Input 9 and not Cur Channel 1
Action
Tx PL enable
Key from WL
Abort Timer 10
Inaction
Tx PL Disable
Start Timer 10 -5 sec

24 - PL Hang Timer
Timer 10 Done
Action
Dekey from WL
PL Enable
Inaction
Null

1 - COS + Audio
RX Carrier Detect
Action
Timer 8 - 30ms
Inaction
Abort Timer 8
Clr Output 7
RX Qual Normal

28 - COR P25 Hold off
Timer 8 done and not RX Astro ID and not Chan 1
Action
Output 7
RX Qual Force
Inaction
Null

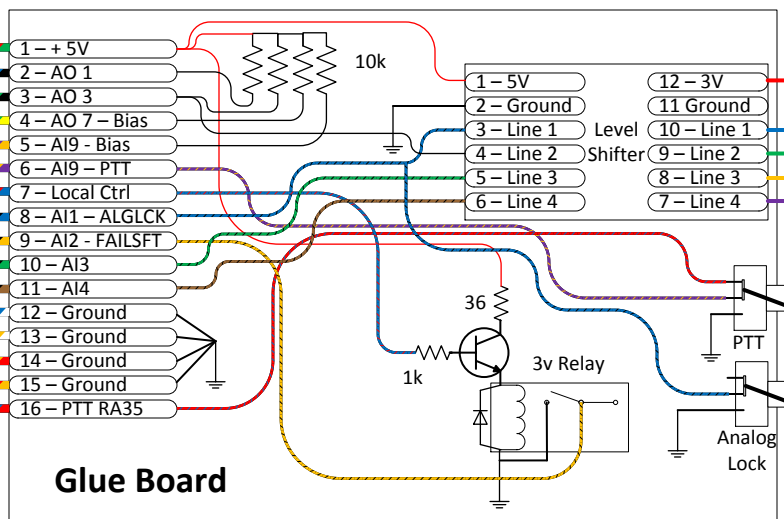
Stand Alone Logic		SIZE	FSCM NO	DWG NO		REV
DRAWN	9-Oct-2017					2
ISSUED	SCALE	1 : 1	Bryan Fields, W9CR	SHEET	3 OF 5	



26			26	Line 1 -
1	Pair 1		1	Line 1 +
27		Pair 2	27	Line 2 -
2			2	Line 2 +
28		Pair 3	28	Line 3 -
3			3	Line 3 +
29		Pair 4	29	Line 4 -
4			4	Line 4 +
30		Pair 5	30	Modem -
5			5	Modem +
31	Pair 6		31	Gen Tx Data -
6			32	Ground
32		Pair 7	7	Ground
7			33	14.2V Out
33	Pair 8		8	5V out
8			34	Gen Tx Data +
34		Pair 9	9	Gen Tx Data +
9			35	PL - In
35	Pair 10		10	PL + In
10			36	Aux Out 1
36	Pair 11		11	Aux In 1
11			37	Aux Out 2
37	Pair 12		12	Aux In 2
12			38	Aux Out 3
38	Pair 13		13	Aux In 3
13			39	Aux Out 4
39	Pair 14		14	Aux In 4
14			40	Aux Out 5
40	Pair 15		15	Aux In 5
15			41	Aux Out 6
41	Pair 16		16	Aux In 6
16			42	Aux In 8
42	Pair 17		17	Aux In 7
17			43	Aux Out 7
43	Pair 18		18	Aux Out 7
18			44	Aux Out 8
44	Pair 19		19	Aux Out 8
19			45	Aux Out 9
45	Pair 20		20	Aux Out 9
20			46	Aux Out 10
46	Pair 21		21	Aux In 9
21			47	Aux In 9
47	Pair 22		22	Aux In 9
22			48	Aux In 10
48	Pair 23		23	Aux In 10
23			49	Aux In 11
49	Pair 24		24	Aux In 11
24			50	Aux In 12
50	Pair 25		25	Aux In 12
25				

ARS Audio Delay Module

- 1 - 12v
- 2 - Input
- 3 - High
- 4 - N.C.
- 5 - Out
- 6 - Ground



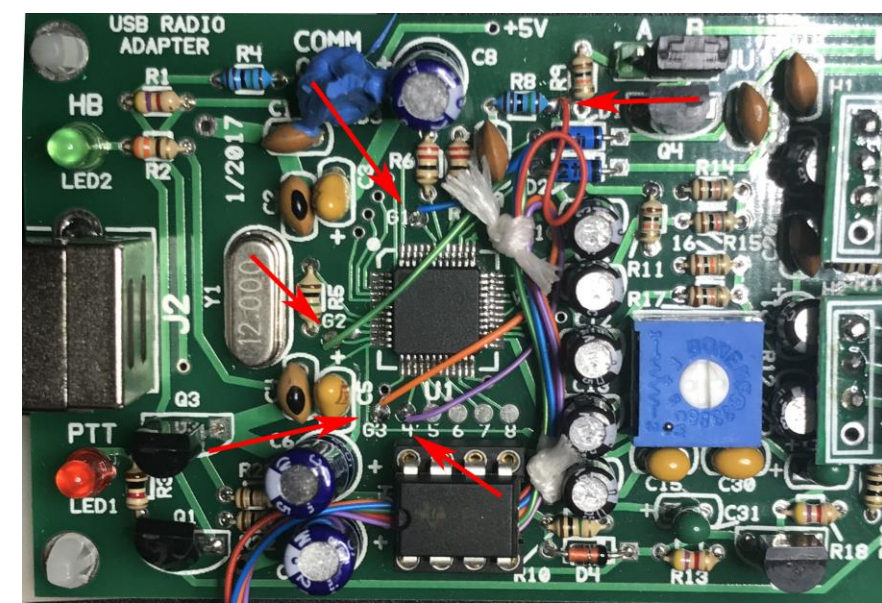
RA-35

- 1 - AUX
- 2 - Audio Out
- 3 - COS
- 4 - PL
- 5 - PTT
- 6 - Audio In
- 7 - Local Ctrl
- 8 - Ground
- 9 - External V+

- GPIO 1
- GPIO 2
- GPIO 3
- GPIO 4
- Ground
- +3.3 V

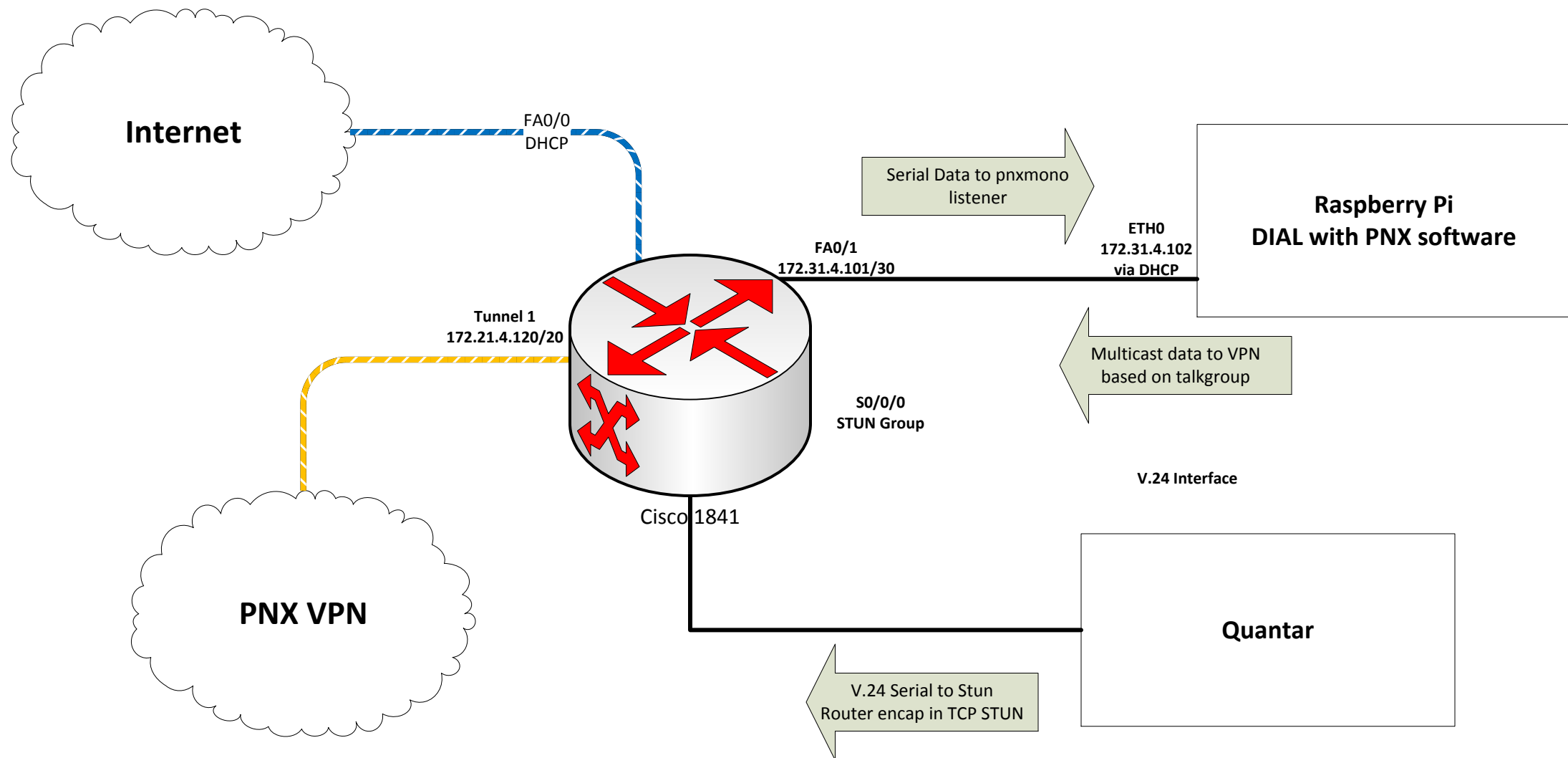
Raspberry Pi and 12v supply

- 1 - 12v in
- 2 - Ground



RA-35 GPIO and 3v hookup locations

Quantar Interconnect and 66 Block		SIZE	FSCM NO	DWG NO	REV
DRAWN	7-Oct-2017				1
ISSUED		SCALE	1 : 1	Bryan Fields, W9CR	SHEET 4 OF 5



There are a couple NAT rules on the router

1. Pass the UDP asterisk port to the inside private IP port 4569
2. Allow port 222 TCP to the PI inside IP for SSH
3. overload NAT allowing external access

You should setup a VTY ACL allowing the following
 172.16.0.0/21
 44.98.249.177/32

Any other IP's you need. Note with the forward, all the internet will be able to get to the public SSH port which is forwarded to the PI. You may want a firewall on the PI.

Setup a login and password, and disable telnet.

Note all this is predicated on the idea the FA0/0 interface has a public IP address. If it doesn't, you have a NAT 444 setup and will need to forward ports from the gateway router. This is beyond the scope of this document.

P25nx and DIAL network			
SIZE	FSCM NO	DWG NO	REV
DRAWN	7-Oct-2017		1
ISSUED	SCALE 1 : 1	Bryan Fields, W9CR	SHEET 5 OF 5