DCC Working Group Meeting, 8AM July 6 2005; informal notes by Bob Jacobsen

Brian Barnt, Michael Greene, Rutger Friberg at front table.

Attendees:

Karl Kobel
David Nicholson
Stan Ames
Bernd Lenz
Didrik Voss
Matt Katzer
Dick Bronson
John Roberts
David Parks
John Roberts
Bob Jacobsen
Walter Naumann

(8:12AM)

Rutger Friberg: calls meeting to order. Introduces self as outgoing technical chair; today is his last official meeting.

Introduces part of IMG – Michael Greene and Brian Barnt, both past chairs. Asked them to take up management during a temporary period of time, along with two European manufacturers and two US manufacturers. Europeans are Dave Nicholson, here now, only manufacturer in UK. Other is Juegen Linder, CEO of ESU. Two US manufacturers: Bill Ataras of Ataras Engineering, and Fred Severson of QSI. These six are IMG; will discuss later. Briefly, plan for continuous solution by October 1. Will work and consult between now & then.

(Juegen Linder arrives, with Ivonne (sp?) from their US sales company)

Friberg: Thanks John Roberts for attending.

Since Seattle meeting, there's been a meeting at Roco, management meeting in Phoenix, Nuremberg meeting of some, large Fleischmann meeting in spring. Expect another meeting in Nuremburg, at least a short one, in early February on the relevant Saturday.

Invitation in late spring for meeting at Marklin. Seems that being hosted by large manufacturer has become a habit in Europe. Shows concensus on need for meetings. Will shortly ask Michael for short review of Fleischmann meeting so US friends can catch up. Was 26 manufacturers from 13 companies, plus 10 private users; a good mix.

(Shows agenda slide)

Is there any other business? Please add now, so we can reserve time. (none raised)

Ask Michael to go over meeting agenda.

Greene: Follow on structure of German meeting. Will do a short bidir update to start, because we talked about bidir, other feedback, functions, a new 21 pin connector, use of CVs reserved for the NMRA, ideas for location-dependent transmission, service mode decoder lock, automated testing, analog control instruction, IMG. Any topics to add? (none raised)

Friberg: Let's move to review of German meeting

Greene: 35-40 people, 1 1/2 days. Presentation from German model railroad on interest of club members. Peter Ziegler & Arnold Hubsch demo location-specific feedback. Talked about status of bidirectional. Extensive discussion of two topics for functions, resulting in posting them for discussion.

21 pin connector – no results form small group of manufacturers working on this. Intent it to document connector, not design it. Topic 0504023, Reinhard is editor.

Friberg: (Shows draft V0.04 RP9.1.1 dated June 02, 2005 on overhead)

Trix and ESU have provided background and support. Want to avoid conflicts in pinout. Also used for MFX Marklin. Can cross index to 8 pin connector; he's done that for Scandinavian users.

(Fred Severson arrives)

Intended for 1A, HO. Perhaps needed other for N?

Linder: same use in smaller loco. 1.5A or 2A is available. Simple plug-in is most important, so mainly HO scale, smaller is mechanically harder.

Friberg: Status?

Greene: Roco, ESU, Marklin, Reinhard Mueller, Digitrax, others working together on it.

Linder: Offered to NMRA, but still using this, also Trix, etc. Reinhard says another manufacturer is using, with other pin out. Is this OK? If so, not really a standard!

Friberg: Need high priority to agree on pinout

(Peter Ziegler arrives)

Friberg: Should mention that Reinhard will be taking task of European DCC coordinator. Jan Abbink was, had coordinated meetings, but is moving home and business, starting new business in gardening, asked to step down. Reinhard very dedicated, has contributed, not linked to commercial business, but knowledgeable, knows German modeling institution like FREMO, etc.

Has tried to have deputies in all positions for smooth transition, so asked Alfred Capek, who will be starting up European test center. Board has decided bugget to update US tooling & start that Tech Center.

Back to connector, Reinhard took responsibility, expect proposal in a month or so.

Nicholson: Commercially available?

Friberg: Yes, multiple types for surface, etc; several manufacturers.

Greene: Asked group to document suppliers, etc, expect to post to WG & make generally available.

Friberg: Still missing people we'd like here for bidir, so move to general feedback issues.

Greene: While you do that, I'll pass around German minutes

Friberg: (shows slide) This is a paper I've been showing since spring, though not in the US. I show now here, will pass out. NMRA is volunteer organization, have quite trouble keeping up with resources of manufacturers. Old example is cab bus. We were able to do the basic bus on the track , with basic packets

(Mike Brestel arrives)

but not efficient enough and fast enough to address the cab bus then. Had we been faster, perhaps a standard or RP on cab bus, allowing interchange. Now have several. Would prefer to be able to buy a cab that fits my hand, that works on any system.

I think we've reached similar point on feedback:

- Railcom
- MFX and soon Trix DCC version
- Umelec/Zimo asymmetric
- Transponding for Digitrax
- Lissy for Fleischmann & Uhlenbrock

All professional systems, some proprietary. We have a rule that RPs & standards, we can only work with non-proprietary. There are discussions about patents, etc. We must realize we cannot master all these situations. One least objective rould be to work together with manufacturers to create "minimum requirement list" so at least systems

don't conflict with each other. Have had discussions. Interoperability better, would prefer we collect info from manufacturers & create interoperability. But at least avoiding conflicts is 1st step.

Need an initiative from manufacturers, rather than working group.

As a user, would like to see a technical committee solving this, so users can just run system. Most users don't know technical details.

Discussion?

Ziegler: Umelec with asymmetric not feedback, not belong on list Zimo just started to implement.

Rutger: somebody suggested as on outskirts, so belong on list

Ziegler: Location specific group, not feedback

Friberg: use to return info?

Ziegler: combination of features

Friberg: OK, skip that example

Nicholson: ZTC will follow bidirectional, as one solution

Friberg: If no more comments, lets move on

Greene: Fair bit of discussion at German meeting, couple hours. Result was two topics: F12-28 instruction, plus discussion of need for other capabilities "binary state control". Currently in formal comment period, many posted, due by end of July 9. Overwhelming support so far. Need to get to end quickly.

Barnt: 9th is during train show, extend?

Greene: OK to 31st?

Lenz: Now something new, request another and another two weeks.

Barnt: But specifically during convention

Greene: Bernd is saying you can plan ahead.

Friberg: Don't want members to expect extensions

Barnt: Extend it a week. Have done in the past.

Linder: Why a week? Lots of comments

Bronson: Most of people here have already commented.

Friberg: Seems strong preference to stay with precedent

Greene: Any other comments? (Pause)

Moving on, we have issues with some manufacturers using CVs marked as reserved. Realizing we have a possible future scenario, we took a firm action to ask manufacturers to send info to me, so we could develop a way of putting that info together & make it accessible, consider it, and develop a protocol and move forward. Several replies, one after the 6/30 deadline, heard another coming. Putting together package. By end of month you can look for a posting to WG list with how we can address planning this.

Have also been talking about a way forward that involves a formal request system for use before allocation, provide coordination. Need to organize common development. Discussed this last night, decided that August 1st if you need a CV you request it.

Bernd: Send that info to all manufacturers, even ones not cooperating with NMRA, so they reamin informed. Helps them realize what can happen in the wrong way & show need for new thing.

Friberg: have followed for several years. We have not always collected info of who is using what. These are not permanent licensing, just for testing; if they become commercial it's a mess. Limit to one year renewable. Secondly, would like to say, as of a certain date, there is no general allowance backward. After, manufacturers need written request, so that can continually control. If desired by people, tell WG about request, not general membership. Or perhaps not tell WG, we need a consensus on that. But we need to organize this. If somebody comes up with better idea, like to hear it.

Kobel: Some manufacturers may not want to tip their has to others

Jacobsen: Have similar situation in past, e.g. decoder lock based on requested & allocated CV15/16. But if manufacturer is putting these in commercial product as part of test & development, they need assurance about future.

Bronson: on accessory end, not clear what you can and can't do in various areas. Can we make this clearer? E.g. handle group request for another area, others say they can use manufacturer area. Manufacturer area is intended to be free of conflicts, because manufacturer specific.

Barnt: Just a definition problem

Green: Two large blocks available now

Bronson: I don't consider them large

Barnt: Accessory 545-593, 624-640 available to manufacturers

Bronson: Same comment

Greene: Likely to create another large block of manufacturer-specific CVs, but based on feedback it looks like manufacturers A, B, C strong same info in different places. Manufacturers don't care, but makes it harder for users.

Bronson: Need to consider unique stuff versus common

Barnt: Have now

Bronson: Not large block. On other side, you need ways to get at lots of info

Kobel: What happened to expansion proposal with pages access?

Barnt: Nothing like that proposed

Jacobsen: In the list of requested test CVs, you might find such a thing. Ask those manufacturers if they're willing to make the details available to the WG

Ames: How many desired for large block?

Bronson: 256

Ames: Of 1024

Greene: Have about 60 manufacturers now, concerned about letting that get out of control.

Linder: Would like to see 128 consecutive for manufacturers, even 256. Regarding use of 25%, should we reserve for future nobody knows, or for development by manufacturers?

For BEMF, one manufacturer started in manufacturers area, the others did that too; market will determine if a feature works and becomes a effectively a standard.

Shouldn't be a problem now in days of software; just need XML database or similar.

Bronson: As manufacturer, stupid not to use existing definitions. But some things are not defined & need space to put them.

Barnt: Have such space

Bronson: Too small

Linder: Yes, key point

Friberg: How much left?

Jacobsen: Michael's proposal is right track. Make it possible to request use of reserved CVs easily, so that others can use these tentative definitions for similar features. Provides a way to move from "first one as test" to "defacto standard".

First use of policy might be a request for large scratch area, continguous

Greene: Accessory decoders might have only 700 left, with another 200 really already in use

Friberg: Really have a request here, must deal with it in a serious manner

Bronson: Happy to say what request is for – setting addresses, etc, of individual lines

Friberg: Two different things. You want it for commercial use, I want it for experimentation, have limitation in time

Ames: Philosophically agrees, but it doesn't really work that way. "Temporary" shows up in product, and it's over the hill before we can deal with it. So say there is a big block for manufacturers, and it's really easy to get specific CVs outside of that. But manufacturer specific in practice might already define a large contiguous block, so 1st proposal might create what you want.

Lenz: Need to rethink classic way we use CVs, introduced 30 years ago.. Micro's capability increased, could now have one million CVs. Just use a paging system in manufacturer area. Why need specific addresses? Similar problem in micro calls

Bronson: Problem for users

Lenz: No, its programming unit problem. Note most programmers in market cannot address above 256, so problem is real now. We need to rethink this. Lenz has, now uses 1025, 1026, 1027, but customer doesn't know it. Customer wants to press button and make it work.

Ziegler: But need mechanism in that command station for the button. And that mechanism is better with access to blocks.

Linder: Same argument also holds in reverse. OK to give 128 now, because won't run out once use indexed addressing.

(Bill Ataras arrives)

Greene: Want to take short break.

(Break from 9:22AM to 10:03; various discussions continue)

Greene: Stan, could you summarize what you decided about CVs at break?

Ames: Lot of experience with doing things in different ways. Lots of demand for more space, so lets enforce a common approach.

Lets put paging in CVs. Pick a specific CV, so that 0 defines the default 1024 locations, 1 is another 1024, 2 is another 1024. Manufacturer area is then the page that corresponds to your manufacturer ID. Put your number in that special low CV, and that's your page.

1st 1024 would be NMRA only, with no more manufacturer CVs.

Kobel: Is there a way to eventually unify the uses?

Ames: (Discussion of way to do this with an indirection; couldn't follow the details, but it seemed to involve multiple indirections)

Barnt: Addressing Bob's point about convergence, as more people converge on a page?

Jacobsen: What's value of limiting people to 1024 by using manufacturer ID value?

Ames: That's not important point, the important point is the 1024 block.

Whatever the solution, let's address the real problem rather than put bandaids on it.

Greene: Will you take action of putting a draft together?

Ames: Sure, but it's only one CV number so it's easy to draft.

Greene: Move on to location dependent information tranmission (Handout dated "June 2005") In Germany, paper from Herr Ziegler & Hubsch, and also demonstration. Ask Peter to present again here.

Ziegler: Zimo makes for many years a technique for signal controller speed influence & location dependent control. Much experience. Works with DCC preamble and interpacket bits. Module isolates part of track, cuts out additional "interpacket" bits with one or two transistors. One bit out means slow down, two cut out is slower limit, up to stop. Seven possibilities. Using method in original form for 10 years.

One disadvantage, it needs rather much bandwidth for extra bits. Today's microcontroller much faster, so now propose new scheme that saves bits. Want to implement new protocol that uses only four interpacket bits & provides more info. A small version could exist using one bit to send less info, but would work with every existing command station without additional interpacket bits.

Barnt: Can't think of any exceptions

Ziegler: anyhow, most certainly work, but is small solution. Main distribution is big one, see page 2 of handout, called "long form". Have plan here how to work with four DCC bits to carry 12 location-dependent bits via cutout.

Messages proposed here, interested in comments, not necessarily done as described here.

1st two bits select following window's meaning:
- speed limit
- direction & brake
- position code 1
- position code 2

Speed limit window format gives 6 speeds plus stop and emergency stop

Direction window gives direction dependence, very useful in current products, have extended a little here in proposal. Need a way to control which way stops. Need a method for loco starting at signal to be allowed to go when it turns green, but only in right direction. Also some info on how to brake, to add some flexibility for e.g. station or signal or staging yard; some are quicker, etc.

3rd & 4th are to transmit code for specific position, so bidirectional can transmit that code back to control station for automatic operation. Done now in old protocol, but new way advantageous. Can also be used to tell decoder to switch on specific functions, etc. Two windows to reduce problem with bridging of gaps, to some extent.

Note yet fully tested in reality, but think it will work based on experience of years. Perhaps some detail need thought.

Ames: It occurs to me that location dependent info is the next area of expanding DCC. No clue as to which is best method, as not have any hardware to test in detail. But we need to select one method if we're going to expand the market. Rutger, what's the right way to proceed to select one method?

Ziegler: This and asymmetric are rather similar – asymmetric is partial cutout, this is a total voltage asymmetry. Full cutout method reduces asymmetric problems due to small

difference, but asymmetric using only 3 diodes is simpler. Can these combine? Perhaps. Zimo uses ours, will try with asymmetric signal stop when one can be obtained.

Ames: Want to bring forward both methods to a testing process, so by whatever means we can select best one. Both will go on, but we need to select one. Issues of backward compatibility, etc, and we just have to figure out as a group.

Lenz: Before starting on that, we need have more important discussions on technology. Is 60 microseconds in writeup really 58?

Ziegler, yes, number is just an example

Lenz: How can I detect in your window the cutout of the levels you have? The way we construct decoders, which edge detection, we cannot see bits that don't change polarity.

Ziegler: Both rails must have inputs.

Lenz: Yes, so you can see going to zero.

(Rapid exchange of details)

Ziegler: You can see number and place of edges, find bits without edges

Lenz: Guarantee it really goes to zero?

Ziegler: yes, via cutout MOSFETs to cutout and switch current

Lenz: Need to source current to get back to zero level.

You cannot with existing technologies detect the info on track.

Ziegler: Our micros have two inputs, can usually do this.

Lenz: Should not discuss new vs old micros. Some people in WG seem to think we should make everything working with tubes.

Bronson: Is there anything to check it for errors?

Ziegler: Receive more than one time. Do not let the train go until receive multiple copies of higher speed limit.

Barnt: Sent every packet.

Greene: Will you move on to building a prototype?

Ziegler: Yes

Barnt: Combine with existing cutout?

Ziegler: Yes, we have to do that

Greene: Lets go back to bidirectional RPs. Distributed at Germany revised versions, took a poll, and asked for poll on list. That's where we sit. Bill, you had comments.

Ataras: Saw a convoluted set of specs for timing windows, attempt to accommodate non-conforming products. Sort of a philosophical point, but believes that WG should protect conforming legacy products. But spending time on non-conforming burns a lot of time & adds burden solely because a manufacturer produced & continues to produce a non-conforming product. We just need to make conforming products work; if somebody goes off the reservation, they're on their own. We need a simpler spec that can easily be implemented.

Second, the 30 microsecond gap in channel 2 isn't necessary, only marginal improvement in putting messages together. 8.5usec between successive bytes. Suggests removing the 8.5 and putting that into the 30usec, make that wider, then can mess up 1st two bytes & still recover 2nd two bytes.

Lenz: The gap between two bytes; two bytes always one message, gap there to follow tubes philosophy, so simple code can transmit. Modern UARTs allow you to load two bytes.

Barnt: Gap between bytes there to allow bit-banged software UART

Ataras: Will anybody do that? Make it optional

Jacobsen: Increase requirements on detector to loosen on detector

Lenz: Detector less cost sensitive, would rather have requirements on it

Ames: Already optional. Moving it to 30 usec gap seems positive suggestion, if manufacturers who are building this stuff agree; lets do that.

Lenz: Agree you can do this with modern micro, which is often also cheaper. Even send four bytes back to back to simplify things.

Ataras: Opt to get right of 30 usec gap requirement?

Lenz: OK

Ataras: Simulation indicates that loss of 1st bytes would sometimes allow receipt of 2nd bytes, without ever incorrectly interpreting 2nd two bytes.

Lenz: Simulation nice method, but in practice running trains on track shows things a little different.

Ames: Just deal with 2nd issue. Planning to get people building these together after meeting, come to consensus & propose changes.

1st question I don't want to touch with a 10 foot pole.

Greene: Can we get a follow up from you Stan?

Ames: Yes, getting together with Bill, Bernd, Peter after lunch.

Ataras: Let's keep optional gaps.

Ames: Let's not talk here, will decide after lunch

Greene: On 1st question, what's people's interest? Put it in a technical note?

Barnt: Don't want to be harsh, but you're saying that as a group we should only consider conforming product

Ataras: Yes

Barnt: Negative side is that we're not really considering the user who has some.

Ataras: Put burden on manufacturer to appease their customer. Manufacturers put out marketing info that makes people think their stuff conforms. If that want to continue deluding their customers, that's their choice, but we shouldn't conspire with them.

Lenz: Agree, for another reason. As time goes on, will be more and more confined; unable eventually to do something, even if product made intentionally not to conform.

Greene: Will take it offline to decide

Ames: What ever you decide, it's easy to do.

Barnt: In this specific case.

Ames: Yes

Ataras: Yes, could get trapped where A&B can't work at same time.

Ames: Really tried to make it backwards compatible. John Roberts on down values this. Lot of friction in this community. Maybe as a general point you're right, but in this specific case it might help.

Kobel: How do we handle product which becomes non-conforming? Can't pull the rug out.

Barnt: Yes we can, but we don't want to

Lenz: Spent lots of time, thus money, to build conforming products. But now see situation were I can build non-conforming products that become a reference for future. Why should I build a conforming product?

Severson: Look at future. Today, buy hardware that people will use for a long time. But as we build products that can be downloaded, people will be able to update as issues arise. We gather to make conforming products, I want people to take the position "I'll fix it"

Greene: As an update, the Service Mode Decoder Lock work is now complete, and has been sent to the Technical Department for approval.

Barnt: Meant to bring demo of analog instruction, but it won't be here until airplane arrives tonight, so stop by late to see it.

Ames: We have issues of moving forward, similar to decision on functions in Germany, where we decided on bit position for length

Barnt: Not in minutes, specifically

Ames: But we discussed it

Greene: My notes say we decided people should not use bit position to determine length

Ames: My memory is different

Greene: Note in topic draft

Ames: But never had a proposal so we can decide if this is the right analog instruction for community. Friday we lose ability to control things.

Barnt: Instruction hasn't changed

Ames: No comment period, not formal decision

Barnt: January 2004

Ames: Lots of comments then

Barnt: On usage, but not on definition of bits in instruction

Ames: But this is a mess. The direction we're going is wrong – we still don't have the final instruction.

Barnt: It did go to a vote in Las Vegas, accepted by all who were present. Unfortunately, not sent to Board at that time.

Ames: But had fight about Service Mode Decoder Lock, which was also approved at that meeting.

Barnt: SMDL not moved out of working group, but analog instruction was. Rediscussed last year under new procedures, but no comments effected instructions

Greene: This all predates me, is the current draft correct?

Barnt: It's been through the procedures once, decided to do it again

Ames: Lets just decide whether its done or note, rather than have a controversy

Greene: Move to next topic

Friberg: We've discussed automated testing for a long time. Now some are automatic, and others require somebody present to observe results, careful not to miss something. Moving toward more automated tests. Administratively, moving toward test by manufacturers, who then submit results for checking and approval.

Want to find a way to move discussions forward.

Universal board with I/O, sophisticated software to do testing. Hand them out & have tests run by manufacturers, have it generate a list of results which is the only thing sent to the NMRA. Then NMRA at its pleasure could test one or two a year, or if there are complaints referring to that test. But wouldn't need to test all, limiting work of volunteers. These tests now cost nothing. We've seen numerous cases where a beginner sends in a decoder, gets a report that lists many items & took lots of time to create, fixes those items and resubmits. We're doing most of the development. I exaggerate a little, but it does occur. We've been tasked by board to look into invoice-based services.

Some previous effort by Bob to build a new test infrastructure, got part way. Status?

Jacobsen: New structure basically working with existing board. Real issue is getting the tests moved over to new infrastructure.

Ames: I'd volunteer to do that.

Friberg: Would you (Bob) work with Mike to move that over?

Jacobsen: yes

Ataras: Has a USB driver card that can do this

Friberg: Can that be bought?

Ataras: Needs software to change bit timings, etc as needed.

Friberg: Would you be willing to develop this?

Ataras: Yes, if we can develop specs, I'd probably like to do that.

Friberg: I'm just trying to provide a vision of ensuring that C&I has enough capacity, manufacturers can get useful tools. Even if it takes two or three years to get this, we need to start. Hardware and software need to be combined, perhaps USB is best approach now.

Barnt: New board with PC104 connectors that runs DOS, so can run existing test software.

Friberg: Add that to group structure so we don't have multiple solutions going on.

There is a budget for new tooling, etc, should use it to go forward, not just buy more scopes.

Ames: Need one more volunteer to create some input hardware to read motor, functions, etc.

Ataras: Current board doesn't have this

Ames: need a hardware type of person to do that.

Friberg: Michael will find somebody to do that, need to find one way forward.

Jacobsen: Had read trouble getting answer & decisions on whether a particular solution would be used. What's point of trying to contribute to a vacuum?

Second, really need to get manufacturers involved in deciding which tests to add to the suite.

Kobel: Perhaps motivate by free only for 1st submission, charge for later ones.

Ataras: for optional parts, e.g. novel parts of RPs, have manufacturer write and submit scripts for the tests they pass. Build a library of these.

Bronson: Don't want NMRA to do work for manufacturer. But manufacturer should not be determining if they conform; NMRA should decide. OK to charge more & more as they repeat. Best just tell them the requirements they need to meet.

Severson: Most discussion revolves around money. Could a consumer-based product be developed to do these tests? Now they'd be a product there so a modeler could say "I won't buy this because it doesn't conform"

Lenz: Big legal risk, if you make a mistake with the test not passing

Severson: Lots of disclaimers

Barnt: PRICOM tester device doesn't say whether something conforms or not, just presents test info

Severson: Prefer big red light

Lenz: It says 60 usec, you need to know that 58usec is on, but you prefer that red/green light

Severson: Yes

Friberg: I've got what I wanted, because I've seen enthusiasm, and put a small organization in place to get started & present something by next meeting. Find out what resources are needed for NMRA, or find somebody to make a product. Even as an indicator, 60% along that the route.

Conclude that part, coming to end of meeting, & move to last item on IMG. Any other business first? If not, I'm make concluding remarks.

(No comments)

I remind everybody present we have a document TN-2004-1 that was approved and accepted December last year. I read from section 3.4 on appropriate and inappropriate use:

> It is important that Working Group members be able to have honest discussions. To do this, the WG members must be able to debate and contribute freely and in confidence. It is only when the Working Group's discussions have lead to decisions that the information on which decisions are based must be disclosed to the NMRA membership.
>
> …

> Prospective WG members must confirm that they are comfortable not disclosing information from the e-mail list or the WG outside the Working Group community until such time as it is deemed public by the Working Group or by the person providing the information.
>
> The Working Group Chair and Deputy Working Group Chair are responsible for preventing recurrence of any inappropriate use of Working Group information and/or unprofessional behavior, and if necessary may remove a member from the Working Group with the concurrence of the NMRA Electrical/DCC/Software Manager.

That is current text we have. Is to pleasure of each chair & technical director to form new documents like this; that is heritage and culture of NMRA. TN2004-1 is approved and current. Effectively we have open discussions here and minutes. Decisions will have to be relayed by IMG chair to new technical chair, who will at his pleasure put it to the Board.

There being no more issues, we'll end this session. As last official action as technical chair, I end this meeting.

(Adjourned 11:32AM)