Note on math font group organization

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This note is based on an electronic mail discussion between Alan Jeffrey and Justin Ziegler. Our suggested breakdown of tasks for the math font group (MFG) is:

1. **Organization**: writing papers such as this one, about the structure and direction of the group.

2. **Requirements analysis**: looking at the needs and current practice of mathematical typesetting, and setting (perhaps unachievable!) goals.

3. **Technical studies**: individual technical analysis, with clear conclusions and stating the advantages and disadvantages of the approaches investigated.

4. **Standardization**: recording the WG’s decisions, leading towards the proposal of new math font encodings and related standards.

5. **Implementation**: designing software to support the new encodings.

These are only rough suggestions, all better suggestions welcomed! We might want to break each task down into subtasks. Organization could include:

- **Statement of purpose**: a one-page document setting out the WG’s aims.
- **Outlining goals**: general papers like this one.
- **Setting timetables**: completion dates for these goals.

Requirements analysis could include:

- **Common mathematical usage**: what features are common across different subjects?
- **Specific mathematical usage**: what features are specific to particular subjects? (For example setting of scripts on roman letters in chemistry, multileter identifiers in computer science...)
- **Non-mathematical usage**: what is math mode used for other than for mathematics? (For example, setting computer programs, fractions, footnote markers, trademark signs...)
- **Compatibility**: how compatible should a new encoding be with Knuth’s?
- **Extensions**: what new symbols and other features are users crying out for?
- **Non-CM fonts**: what are the requirements for users of non-CM fonts (for example PostScript outline fonts).

Technical studies could include:

- **The current state of \( \TeX \)**: what are the good and bad points of \( \TeX \)’s current mathematical typesetting?

- **The limitations of \( \TeX \)**: what restrictions does \( \TeX \) make to mathematical typesetting? (For example, the math spacing table in Chapter 18 of *The \( \TeX \)*book is hard-wired, Appendix G of *The \( \TeX \)*book overloads many font dimensions...)

- **Prototype implementations**: each part of the standard should be α-tested before standardization.

- **Studying requirements**: work on problems suggested by the requirements analysis task.

Standardization could include:

- **Font encodings**: this is probably the most important point!
- **Encoding vectors**: naming all the symbols as PostScript encoding vectors.
- **Font information**: any new font dimensions, kerning information, charlists, and so on.
- **(B)\( \TeX \) interface**: how the fonts can be used in (B)\( \TeX \), for example giving default control sequence names for each glyph.

Implementation could include:

- **METAFONT programs**: implementing of the encodings using character shapes based on cmmi, cmsy and cmex.
- **\( \TeX \) programs**: a replacement for plain.tex, and document styles for using the font encodings with \( \TeX \).
- **VPL manipulation tools**: to help install Non-CM fonts, we may need general virtual font manipulators.
- **Benchmarks**: equivalents of the trip.tex and testfont.tex tests for the new encodings.

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