

- (1) No. units installed/projected
- (2) BRIEF Resume W.S.B. with explanation of unique conditions pertaining to the installation.
- (3) The Red Herrings of spindle run out and spindle-spindle cabinet-cabinet interaction
- (4) Summary of improvements in relation to stable Read/Write control.
I.E. Head screws, optical detent, twelve turn pots, Temp. Comp.
- (5) Set it up and forget it.
- (6) Operator training and In House ground rules.

WHERE WE WERE
WHERE WE ARE
NOW

HOW WE GOT THERE

9480/81 PRESENTATION
INTERNATIONAL GROUP
SPRING MEETING 1975

(1) Installed units

9480 10 9481 21

All 9480 with one exception are on B700.
All 9481 with one exception are on B1700.

Projected by year end '75.

9480 16 9481 37

Above figures reflect signed orders only.

(2) The installation Wanganui Savings Bank will be used as the example because of the traumatic effect the change from 9480 to 9481 had on both us and the user.

The bank is a "Trustee" Savings Bank administered by a Board of Directors comprised of business and professional men and women prominent in the community area in which the bank operates. All nett profits are channeled back to the community via worthy cause donations etc.

This particular Bank is only eleven years old and has had an average growth rate of 25% per year since its formation . They presently have 48000 accounts which have been progressively transferred over from E2000's to the B1700 since installation.

All computer supervisory and operating staff were seconded from within their own personnel structure and with the assistance of Banking B.M.S. they have done a very commendable job.

The system (B1714, 9419, 9480 & 9249) was installed November '73 (not requalified) using Banking B.M.S. and the Grandfather Father Son cartridge back up approach.

With the number of Bank Branches involved this resulted in virtually 24 active cartridges and 12 back up cartridges.

Initially the system ran quite well and certainly we had virtually no problems with the 100 T.P.I. drive.

The system was gradually requalified during the first half of 1974 using card exchange from a captive mainframe and at week-ends for those cards where card exchange was not possible.

(3) In April 1974 we installed the first 9481 serial B4050-018.

Because of the number of Bank Branches, the continued progressive addition of accounts and the way the files were constructed disk dumping was an integral part of their operation with disk dumps to six cartridges per day being the average. Though we did not for some time recognise it, here was our main problem, frequent cartridge changes.

The site engineer P.F.S'd the first 9481 and it went for a few days before the rot set in so he was at fault.

The Branch back up engineer went in to help with the same end result after a few days operation so he was at fault.

Tech Section were called in, same again, so we were blamed.

About this time we decided we had a rogue unit so a decision was made to change the drive. Unfortunately in our innocence the next drive we installed happened to be 4051 and because we did not yet know the gremlin we were chasing this unit exhibited all the same problems of it's predecessor. With this unit (4051) we thought we had made a major break through we had identified spindle run out.

This was where we started marking the cartridges and the spindle and mating the two marks on cartridge insertion.

However despite our efforts we were getting nowhere fast and since a new drive had arrived by air from the plant we decided to change again.

It was decided we would go over this unit with a fine tooth comb and to allow us sufficient system time the Bank were sent to our Christchurch Data Centre (they were at this time 6 working days behind) to try to catch up their work. They (the Bank) took all their cartridges and media and needless to say on arriving in Christchurch soon found that virtually none of their disks were compatable with the Data Centre drives with the nett result that they returned to Wanganui 10 working days behind.

We are now running again but about this time we find out the significance of 12 turn pots as opposed to 1/4 turn pots.

B4741 has arrived in the country, we examine and find it has 1/4 turn pots in only two locations so we decide to change again this time as it happens is the last change.

This time in order to disrupt the Banks operation as little as possible we change overnight. In comparison to what we had we have now achieved, if not totally acceptable, at least from the Banks point of view a reasonably satisfactory level of reliability. From this point on we should call this the "Thermal expansion" phase.

Temperature tests indicate that the top spindle runs 8-10 degrees above the bottom spindle.

The addition of solid state relay K4 has aggravated this to some extent as the aluminium mounting plate for K4 now fills up the large hole under the R/W board.

Install additional fans, one pushing one pulling, to improve air circulation in the top spindle, and this together with an operational procedure change IE dumps performed at the beginning of the next shift rather than the end of this shift a significant improvement is achieved with parity errors and time outs.

It should be noted that Field Engineering under normal circumstances does not and should perform a design function.

However it is also fair to say that when you have equipment actually installed in the Customers office that does not work you really are standing knee deep in alligators.

I firmly believe that 98% of our front line people do not want to design, genuinely want to fix the current problem and get out of the customers office and actually feel personal failure if a machine is ever sent back from their territory.

The rest is now history because with Temp Comp the 9481 works.

- (4) But we must bear in mind that Temp Comp alone will not fix a drive that is basically off test.
 - (1) Head locking screws
 - (2) 12 turn pots
 - (3) Location of K4
 - (4) Correct arcs suppression
 - (5) Optical detent spring
 - (6) Optical detent outputs correct for all phases.
 - (7) Good markite strip.
 - (8) Carriage rails bearings and markite strip clean.
 - (9) All tests and adjustments performed carefully and correctly (discriminator)
 - (10) Plus temp. comp.
- (5) We should not be readjusting the drive every other day there is no need.
- (6) We should only be keeping it clean and replacing failed components if and when they occur because it works.

INSTALLED UNITS

9480 10

9481 21

PROJECTED TOTAL
INSTALLED UNITS TO
YEAR END '75

9480	16
9481	37

REFLECTS SIGNED ORDERS
ONLY

WANGANUI

SAVINGS

BANK

"TRUSTEE"

BANK

ESTABLISHED ELEVEN
YEARS

AVERAGE GROWTH
RATE/ YEAR 25%

NO PREVIOUS E.O.P.
BACKGROUND.

48,000 ACCOUNTS

FROM E2000

TO

B1700

CONFIGURATION

INSTALLED

NOVEMBER '73

B1714 (32K)

9419

9480

9249

BANKING B.M.S.

GRANDFATHER

FATHER

SON

CARTRIDGES

12 IN SAFE

24 IN COMPUTER ROOM

REQUALIFIED

AFTER INSTALLATION

BY

CARD EXCHANGE

AND

WEEKEND O.T.

INSTALLED FIRST

9481

B4050-018

APRIL '74

DISK DUMP

NOW BECOMES

THE MAJOR PROBLEM.

AFTER 330 MAN HOURS
ON B4050
INSTALLED B4051
END MAY '74
BECAUSE OF SPINDLE RUN OUT?

JUNE '74 DISASTER
WEEK 3 SIX DAYS BEHIND.
GO TO CHRISTCHURCH COME
BACK.
TEN DAYS BEHIND.

WHITE BANK IN CHRISTCHURCH

WE CLEAR THRU CUSTOMS AND INSTALL

B4739

ALREADY HAS NEW STYLE HEAD

SCREWS.

BUT ONLY SOME 12 TURN POTS.

RECEIVE LONGEST

TELEX EVER

TWO FEET THREE INCHES

1500 WORDS.

JULY 9 '74

CONTAINED SOME OF THE INFORMATION
WHICH WAS SUBSEQUENTLY REVISED AND
PUBLISHED IN DETAIL IN P.I.B. 91
SER.T. '74.

WE ARE EVEN MORE MISERABLE
WHEN WE RECEIVE ADVICE OUR
ALIGNMENT CARTRIDGES ARE
SUSPECT.

INSTITUTE INITIAL WARM-UP
PERIOD AND 90 SECOND DELAY
BEFORE USING ANY CARTRIDGE.

RECEIVE REVISED TESTS AND
ADJUSTMENTS AND PRE-RELEASE
COPIES OF R.I.N.'S 8, 9,
11, AND 12.

UNABLE TO OBTAIN SUFFICIENT
SUITABLE MULTI TURN POTS
LOCALLY.

RECEIVE 100%

TESTED

ALIGNMENT CARTRIDGE.

DISCOVER B4741 HAS MORE
FACTORY FITTED 12 TURN
POTS THAN B4739. INSTALL
B4741 OVERNIGHT JULY 6.

SEND SPINDLES TO D.S.I.R.
STATIC TESTED ONLY BUT
REPORT STATES SPINDLES ARE
WITHIN SPECIFICATION.

NOW - "BELIEVE" THE PROBLEM
IS THERMAL EXPANSION AND
DISCOVER THE TOP SPINDLE
CASTING IS 8-10 DEGREES
HOTTER THAN BOTTOM SPINDLE.

SER TEMBER

FIT ADDITIONAL FANS IN AN
ATTEMPT TO FURTHER STABILISE
CABINET TEMPERATURE.

INSTITUTE A FURTHER PROCEDURE
CHANGE I.E.
HAVE DUMPS PERFORMED AT THE
BEGINNING OF THE NEXT SHIFT
INSTEAD OF AT THE END OF
THIS SHIFT.

NOVEMBER
BANK SIGN AN ORDER FOR
TERMINAL EQUIPMENT.

CONFIGURATION IS NOW

B1714 ~~(48K)~~ 56K
9419
9247 (750 LPM)
9481

JANUARY '75

INSTALL TEMP COMP DUMP

PROBLEM IS NOW DEAD SO

INSTALL SECOND 9481.

BANK REPORTS 120 DISK

DUMPS AFTER TEMP COMP

WITHOUT A SINGLE HALT.

SUMMARY

HEAD SCREWS

12 TURN POTS

OPTICAL DETENT LOCKED

CORRECT ARC SUPPRESSION

TEMP. COMP.

GOOD OLD COMMON SENSE. IN-HOUSE COMPUTER ROOM PROCEDURES AND CONFINING OUR P.M. TO KEEPING THE UNIT CLEAN.

ERROR STATUS

DEC 12 74 - FEB 9 75
5 WEEK PERIOD

IRRECOVERABLE DISK
PARITY ERRORS

25
5 PER WEEK

TIME OUTS

10
2 PER WEEK

FEB 10 75 - MARCH 16 75
5 WEEK PERIOD

AFTER TEMP COMP

TWO

160
ZERO Dumps.

T H E

9 4 8 1

W O R K S.