Backup Utility

281-T02-2K3-01

REVISION HISTORY		
ECO #	DATE	DESCRIPTION
0277	3/29/84	Added Section 1.1
0328	6/28/84	New ZETACO Cover

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1.0   INTRODUCTION

This package consists of a backup program, a restore program
and a stand-alone restore program. The backup and restore
programs are executable on versions 3.4, 3.5 and above
of the DX10 operating system. For version 3.6 you must
insert the software change listed in Section 1.1.

The utilities, by virtue of their speed, make the backup
of disk to tape an effective means of checkpointing/
restarting a system on a regular basis. Save, restore
and verify operations are performed in a physical
manner with respect to tracks, sectors and ADU'S rather than
on a logical basis with respect to files and directories.

1.1   BACKUP MODIFICATION FOR DX10 3.6

After inserting this change use version 3.6 or above.
Version 3.5 or below will not run with this change.

```
MPI
PF: .MEMTRAC.PROGRAM (OR .CIPCSI.PROGRAM)
OAN:
MT: TA
MN: INIT        | BACKUP                    | RESTORE
AD: >2C4        | >2F2,>2CC,>308,>322       | >152,>1D12,>12C,>168,>182
VD: >7A         | >7A,>78,>78,>78           | >7A,>7A,>78,>78,>78
DA: >7C         | >7C,>7A,>7A,>7A           | >7C,>7C,>7A,>7A,>7A
CH:
RD:
```

2.0 UTILITY DESCRIPTIONS

2.1 BACKUP

This utility is intended to backup online disk volumes to tape. It is operated interactively in a batch fashion by entering a series of up to eight (8) disk volume names to be backed up to tape. The input for this utility can be specified by a control file or can be prompted from the keyboard. The utility will look for input from a control file first; if no control file exists, input will be prompted from the keyboard. A synonym 'V$$C$$F' is reserved to indicate the presence of a control file. If this synonym is defined, the file name that it represents will be used as the disk volume control file. In the majority of cases the same volumes will be backed up on a regular basis and the control file simply removes the chore of specifying the same names for a constant list.

Since the volume control file will be constant, it has a rigid format. It is expected to be a sequential file with a logical record length of eighty (80) characters, each record of which specifies a valid disk volume name. Only the first eight (8) character positions are significant... positions nine (9) through eighty (80) are ignored. Up to eight volume names may be specified in this manner. No volume name may have a leading space as it will be treated as end-of-file. If a volume name is encountered with illegal syntax, the utility is terminated. A specified disk volume name is considered to be unique.

If the name is not unique, that is, a disk volume by this name is found on more than one disk unit you will be given the opportunity to qualify it as to the correct disk unit. If the specified disk volume name cannot be found, it is assumed to be offline and you will be given the opportunity to place the volume online.

A backup cannot be made of an installed volume. This is to insure that the copy is valid by preventing modification of the disk volume while the backup is in progress. If the disk volume is installed, you will be asked if you wish to have the volume unloaded for you. If this is not successful, you will have to unload the volume, proceed to the next entry, or abort the utility. To abort the utility to the current backup, the 'Hard Break' sequence is used, that is, 'Blank Orange' (Reset) followed by 'Control X'. If the system disk is encountered, it will be the last volume to be backed up. All active tasks and terminals must be terminated at this time.

Optionally, you may have a message displayed to all
terminals indicating that system disk backup is in progress.
If the response to the "Display Message to all Terminals"
prompt is 'Yes', each terminal will be initially "Opened".
Since there is a wide array of video terminals both
standard and non-standard on TI 990 Systems and since
types of each may be on a single system, it is not feasible
to write directly to each terminal. Therefore, if
one has a terminal with an indefinite open/reconnect
timeout or non-standard keyboard device drivers that
'Hang' if no interface card is present or if such terminals
are not "Offline", the response to this prompt should be
'No' to prevent a 'Hang' condition. If the verify option
is selected, it is performed on a reel by reel basis at
the end of each reel. Occasionally, a bad tape will be
encountered or a parity error will occur on a tape just
written. In these cases, you may restart the backup
from the beginning of that reel and continue. This
utility copies only the allocated portions of a disk
volume. If a read error is encountered, the current
disk backup is terminated. This utility is not Memory-
Resident and it must reside on the system disk.

All fatal I/O errors are reported as they would appear
in the system error codes manual. The manual should be
consulted as to the cause of the error.

This utility is the converse of the backup utility in that
it restores a tape backup data set to a disk volume.

The initial appropriate responses here are the name of
the input tape unit (the unit from which tapes will be
read), and the output disk unit (the unit to which the
copy is to be made). This utility will not restore to
an uninitialized disk unit. Use the 'IDS' utility to
initialize the disk. The copy can also be verified
(User Option). Restores are perfomed only to disk units
of the same type as that of the original backup. Like
the companion backup utility, this program will not copy
to an installed volume and will not restore a backup to
the system disk. The Stand-Alone Restore program must
be used for this purpose.

If the response to the "Restore at High Speed" prompt is
"Yes", the utility becomes Memory-Resident for the
duration of its execution; it will become Disk-Resident
again upon termination. The efficiency of a high-speed
disk restore is dependent upon the activity of the system;
the less system activity the more efficient the disk restore.

To abort this utility at any time, use the 'Hard Break'
sequence, that is, 'Blank Orange' (Reset) followed by
'Control X'.

All fatal I/O errors are reported as they would appear
in the system error codes manual. It should be consulted
as to the cause of the error.

2.3   STAND-ALONE RESTORE

The Stand-Alone Restore program is located at the beginning

of the first tape of a backup data set. This program executes

without an operating system and will restore a disk

backup in the event that the system disk becomes unusable.

The utility expects a standard Model 911 terminal at CRU

address 0100 and interrupt level 10 (usually, "ST01")

and a real-time clock wired to interrupt level 5 or 15.

It is loaded by the ROM Loader in the standard tape

loading sequence or in the case of a 990/10A, depress

alternate load button. To load this program perform

the following steps: (not 990/10A)

1)   Ready tape unit and remove write ring

2)   Press the 'Halt/SIE' Button

3)   Press the 'CLR' Button

4)   Set the data lights to 0082
       (lights 8, 14 On...All others Off)

5)   Press the 'MA' Button under the 'Enter' Section

6)   Press the 'CLR' Button

7)   Set data lights to tape controller address
       (if F880, then lights 0, 1, 2, 3, 4, 8 On...All others
       Off)

8)   Press the 'MDE' Button

9)   Press the 'MAI' Button

10)   Set data lights to select code of tape unit on tape
       controller specified in Step 07 as follows:

                0 - 8000   (Light 0 On ... All others Off)

                1 - 4000   (Light 1 On ... All others Off)

                2 - 2000   (Light 2 On ... All others Off)

                3 - 1000   (Light 3 On ... All others Off)

11) Press the 'MDE' Button

12) Press the Load Button

13) The Stand-Alone Restore Program is loaded from tape
     and awaits input from the keyboard.

All prompts are terminated by the "Return" key. The only

allowable keys (characters) are 0-9, A-Z, 'CR' and

left arrow.

The tape controller should occupy the "preferred" address,

namely 'F880'. Normally, units serviced by this controller

will be known as 'MT01-MT04'. These standard tape unit

names are accessible by entering 'MT01-MT04' in response

to the prompt for the tape controller address. It will

be taken to mean the following:

(MT01 - Tape Controller Address = F880, Select = 8000)

(MT02 - Tape Controller Address = F880, Select = 4000)

(MT03 - Tape Controller Address = F880, Select = 2000)

(MT04 - Tape Controller Address = F880, Select = 1000)

Otherwise, the tape controller address and the unit

select code must be specified.

NOTES:

To accept the defaults, press 'Return' at both tape and

disk unit address prompts. The defaults are MT01 as tape

unit address and DS01 as disk unit address. Whenever a

physical controller address is entered, then the unit

select must be entered also. This must be entered in

hexadecimal form.

It is also expected that the disk controller will occupy
the "preferred" address, namely F800. Normally, units
serviced by this controller will be known as 'DS01-DS04'.
These standard disk unit names are accessible by entering
'DS01-DS04' in response to the prompt for the disk
controller address, it will be taken to mean the following:

(DS01 - Disk Controller Address = F800, Select = 0800)

(DS02 - Disk Controller Address = F800, Select = 0400)

(DS03 - Disk Controller Address = F800, Select = 0200)

(DS04 - Disk Controller Address = F800, Select = 0100)

Otherwise, the disk controller address and the unit select
code must be specified.

If the response to the 'change device interrupt levels'
prompt is 'No' then it is assumed that the tape controller
has interrupt level 09 and that the disk controller has
interrupt level 13. Otherwise, the interrupt levels
must be entered.

Although this utility performs some surface analysis,
it is not intended to be a substitute for the standard
'IDS' utility. As is the case with 'IDS', it can never
be guaranteed that all bad tracks will be found. Therefore,
when initialization is indicated or prompted, one should
enter the location of all known bad tracks. These are
entered by head and cylinder. This should always be
done when there are known bad tracks.

Optionally, the copy may be verified. All disk and tape
errors are reported as they would be reported under
the system along with the 'before' and 'after' controller
images. A disk restore will only be performed to a disk
like that of the original backup. At the time of the
stand-alone restore the characteristics obtained from the
"Restore" command must match that of the disk backed
up to tape even if the actual disk type is not the
same. All fatal I/O errors are reported as they would
appear in the system error codes manual. These error
codes also indicate whether the error is a unit error or
a controller error or otherwise.

A tape scan program is provided for instances where the
reliability of the disk backup tapes is needed to be know
before starting the backup. This will eliminate encountering
any uncorrectable errors half way through the process which
is especially important for those with single fixed disk
systems.

3.0   INSTALLATION

The release tape (Tape MXXX CSI Backup Utility) was made via 'BD', the directory name was '.CIPCSI'. When installing this software, via the 'RD' (Restore Directory) command, the associated SCI procedures expect the program file containing the utilities to be at this directory (the procedures expect to find the program file at the directory named '.CIPCSI').

However, one may choose another directory. If this is done, then the procedures must be altered accordingly. It may be desirable to place these procedures in the system procedure library, however, it is our recommendation that you use the .USE SCI command to change PROC directories (.USE .CIPSCI.PROCLIB,.S$PROC).

Line twenty-four (24) of the terminal display is used for status, user options, and prompts. All prompts that require a response are terminated by the "Return" key. Some prompts do not require explicit input; depressing the "Return" key will resume execution. For example, awaiting the next tape reel to be mounted does not require any explicit input. The only exceptions to this are those instances in which a function key may be entered.

If the high-speed restore ability is to be used the 990/TC board must have jumpers J7-2 and J7-4 installed and J7-1 and J7-3 not installed.

These programs require more than 128K of Memory to be run.

3.1   DISCLAIMER

Custom Systems provides these utilities without charge
to all 990 T/C Customers. Although these utilities have
been tested on a number of different system configurations,
Custom Systems cannot guarantee proper operation on every
possible disk/tape/CPU combination and therefore assumes
no responsibility for loss of data, time or monies resulting
from use of the utility. The User should test these
programs thoroughly before committing them to full time
service.